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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT COMPREHENSIVE PROJECT REPORT

FOR THE PROPOSED DESILTING AND CONSTRUCTION OF NYALILBUCH
WATER PAN IN RAMOR VILLAGE, SAIMA SOI WARD, BARKATIEW SUB-
LOCATION, YATIA LOCATION, BARINGO NORTH SUB-COUNTY, BARINGO
COUNTY



GPS Coordinates:

Longitude **35.858860 °E**, and Latitude **0.7619460 °N**, 200m above sea

Ministry of Agriculture & Livestock Development (MoAL&D)

FEBRUARY 2026

PROPONENT:	LEAD EXPERT:
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FACT SHEET

Project Name	ESIA for the Proposed desilting and construction of Nyalilbuch Community Water Pan in Ramor Village, Yatia Location, Baringo North Sub County: Baringo County.
Assignment Name	Summary Project Environmental and Social Impact Assessment (ESIA) Report
Location	Baringo County Baringo North Sub-County Saimo Soi Ward Yatia Location Barkatiew Sub-Location Ramor Village
GPS Coordinates	Longitude 35.858860°E, and Latitude 0.7619460°N, 200m above sea level
Project Description	Proposed desilting and construction of a 18,250 cubic meter Water Pan comprising of; <ul style="list-style-type: none"> a) Excavation of the water pan, clearing of overburden materials and the top soil b) Equipping and installation of solar powered pump for the water pan. c) Construction of a water kiosk and cattle troughs. d) Construction of ancillary facilities (Toilet, cattle watering trap and community water site)
Project Cost	Kshs. 18,284,929(Eighteen Million Two hundred and Eighty Four Thousand, Nine Hundred And Twenty Nine Shillings Only)
Proponent	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)
Address of the Proponent	Hill Plaza 9th Floor, Ngong Road P.O. Box 30028 00100 Nairobi, Kenya E-mail: info@kilimo.go.ke. Telephone: +254-20-2718870.

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. I, the undersigned, confirm that the contents of this report are a true representation of the ESIA process for the ESIA for the Proposed desilting and construction of Nyalilbuch Community Water Pan in Ramor Village, Yatia Location, Baringo North Sub County: Baringo County.

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FOR PROPONENT

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State Department for Agriculture
Program to Build Resilience for Food and Nutrition Security in the Horn of Africa
(BREFONS)

Proponent Representative Name.....

Proponent Representative Title.....

Proponents Representative C o n t a c t s

Signature: Date:

ACKNOWLEDGMENT

We, the ESIA study team Mr. Erick O. Orwa (Lead) and Miss. Siti Athuman Mwarora (Associate Expert) wish to acknowledge and express our profound gratitude to the National Project Coordinating Unit (especially Mr. Kennedy Makudih; the Project Coordinator and Ms. Janet Oyuke; the Environmental and Social Safeguards Officer) of Build Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS) for commissioning this ESIA CPR. We also wish to acknowledge the support received at County level from Mr. Elphas Rutto, who is the Baringo County Project Coordinator (CPC).

We appreciate the co-operation and contributions of all the stakeholders who we interacted with during the preparation of this ESIA report, without their support this study would not have been successful.

Finally, we wish to appreciate the contributions made by the entire community of Nyalilbuch Community for providing us with useful information and filling out questionnaires during the field visits and public participation forum.

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LIST OF ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
AfDB	African Development Bank
ASAL	Arid and Semi-Arid Land
BREFONS	Program to Build Resilience for Food and Nutrition Security in the Horn of Africa
CAP	Crisis Action Plan
CBOs	Community Based Organizations
CDDC	Community Driven Development Committee
CESSCO	County Environment and Social Safeguard Compliance Officer
CGB	County Government of Baringo
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
CPs	Contracting Parties
CSR	Corporate Social Responsibility
DRSLP	Drought Resilience and Sustainable Livelihoods Programme.
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
IFC	International Finance Corporation
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
MoALD	Ministry of Agriculture & Livestock Development
MoU	Memorandum of Understanding
NEAP	National Environmental Action Plan
NEMA	National Environment Management Authority
NGOs	Non-Governmental Organizations
NPCU	National Programme Coordination Unit
OHS	Occupational Health and Safety
PAPOLD	Participatory Analysis of Poverty and Livelihood Dynamics
PCU	Programme Coordination Unit
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
CPR	Comprehensive Project Report
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

The Building Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS) project is a Kenyan initiative funded by the African Development Bank (AfDB). It aims to combat food insecurity exacerbated by climate change through sustainable agro pastoral development, increased household incomes, and enhanced climate adaptation. BREFONS builds on the successes and lessons of earlier programs, including DRSLP Phase I, SIVAP, and RLACC, and is implemented by the State Department for Crop Development under the Ministry of Agriculture and Livestock Development (MoALD) in seven counties: Baringo, Isiolo, Marsabit, Samburu, Turkana, West Pokot, and Garissa.

One of the key interventions under BREFONS is the Nyalilbuch Community Water Pan Project in Ramor Village, Baringo County. Identified through a needs-based prioritization process led by the County Government, the project targets a community with no access to reliable fresh and clean water. The nearest borehole, located 7 km away, it is known as the Karimo borehole and another water source the community depends on is the barkatiew pan Water Pan that is 8km away. The community members have to cover this long distances by foot every day because their location does not convenient for use of any means of transport.

The proposed desilting and construction of the water pan will improve access to clean water for domestic, livestock, and small-scale agricultural use, enhance hygiene and sanitation, and reduce the financial and physical burden of water collection. With strong community support, the project is expected to significantly improve livelihoods, health, and resilience in Ramor Village, aligning with BREFONS' broader goal of fostering food and nutrition security in the Horn of Africa

The proposed desilting and construction of the water pan will provide a reliable, fresh water source for domestic use and livestock, improving public health, reducing gendered burdens, and enhancing drought resilience. The project is a joint initiative of the County Government of Baringo and the BREFONS Programme, under efforts to promote sustainable water access and climate resilience in arid regions.

In adherence to Kenyan government policy, all new projects or activities require an Environmental and Social Impact Assessment (ESIA) during the planning stages. This ensures that significant environmental and social impacts are addressed throughout the project lifecycle from planning and design to construction, operation, and decommissioning. The screening process conducted in October 2025 identified the proposed Nyalilbuch Community Water Pan project as a Medium-Risk Project according to the 2nd schedule of the Environmental Management and Coordination Act (EMCA Cap 387), as amended via legal notice no. 31 in April 2019. Additionally, the project falls under Category 3 according to the African

Development Bank's Integrated Safeguards System (ISS) regarding Environmental and Social Risk Classification.

Therefore, the proponent – 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) – undertook Environmental and Social Impact Assessment and developed a Comprehensive Project Report (CPR) pursuant to Regulation 7 (1) of the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019.

The assessment approach and methodology for this exercise was structured to cover the requirements under the Environmental Management and Coordination Act (EMCA), 1999 and its subsequent regulations, as well as the African Development Bank's Environmental and Social Safeguards. The scope of the assessment covered impacts directly or indirectly associated with the construction, operation, and decommissioning phases of the project. The consultant used both conventional and participatory approaches in identifying potential environmental impacts and appropriate mitigation measures for the proposed project.

The assessment largely involved understanding the project background, preliminary designs, and the implementation plan, as well as commissioning. In addition, baseline information was obtained through physical investigation of the site and the surrounding areas, public consultation (which included discussions with local administration and the community), photography, as well as discussions with the Proponent. A total of 25 persons (17 Male and 8Female) of whom eight (8) were youth participated in the public participation exercise that took place in Ramor Village on 24th February, 2026 where a total of 15 questionnaires were administered and completed. The process culminated in the preparation of an ESIA Comprehensive Project Report encompassing the details specified in the Environmental Impact Assessment/Audit Regulations (2003) and subsequent amendments (2015 &2019).

Although there are a number of justifications of why the project should be developed in the area, there are various negative impacts raised that affect the environment and social wellbeing and therefore the proposed mitigation measures will reduce the adverse impacts. The main negative impacts during the construction phase, several negative environmental impacts are anticipated, each requiring mitigation measures. These include temporal restrictions on site access, disturbance of vegetation and biodiversity, soil erosion, noise and vibration from construction activities, and air pollution from motor vehicle emissions and dust. Additionally, risks such as oil spills, solid waste generation, and accumulation of excavated materials and desilted silt need careful management to minimize environmental harm. Socio-economic impacts during construction include concerns over occupational health and safety, heightened risks of accidents to the community, increased exposure to diseases like HIV/AIDS, potential labor risks and influx, risks of social conflict, child labor,

school dropout rates, gender-based violence, and sexual exploitation and abuse by project workers against community members.

The proposed mitigation measures during the desilting and expansion phase will prioritize ecological protection, structural stability, and public health safeguards. Prior to excavation, a pre-desilting ecological assessment will be undertaken, including rescue and relocation of mudfish and phased desilting to reduce habitat destruction and excessive turbidity. Sediment control measures such as temporary retention barriers and controlled drawdown procedures will be implemented to prevent downstream sedimentation. To address risks associated with contaminated sediments, sediment quality testing will be conducted and unsuitable material disposed of at approved sites. Embankment expansion will be guided by geotechnical investigations, proper slope design, layer compaction, and spillway reinforcement to ensure structural integrity. Soil compaction will be minimized by restricting heavy machinery to designated routes and rehabilitating disturbed areas through ripping and re-vegetation.

To prevent contamination of the reservoir, pit latrines will be sited at safe setback distances from the water body following soil permeability assessments, with lining where necessary. Livestock troughs will be constructed with concrete bases and drainage channels connected to soak pits to prevent nutrient runoff and stagnation. Solid waste generated during construction will be managed through provision of collection points and routine site clean-up. Safety measures including signage, controlled access zones, and community sensitization will reduce accident and drowning risks. During the operational phase, routine water quality monitoring, aquatic vegetation surveillance, embankment inspections, and maintenance of buffer vegetation will be undertaken to safeguard environmental sustainability. A community-based management structure will oversee compliance, water use regulation, and environmental monitoring to ensure long-term functionality, ecological balance, and shared stewardship of the rehabilitated Water Pan.

The Environmental and Social Management Plan (ESMP) outlines targeted measures to address impacts associated with the desilting, expansion, and operation of the existing Water Pan. Key provisions include phased desilting and rescue of aquatic life, sediment testing and controlled disposal, geotechnical stabilization of embankments, safe siting and lining of pit latrines, construction of livestock troughs with proper drainage, rehabilitation of disturbed areas, and routine water quality and invasive species monitoring. The plan also incorporates safety measures, community sensitization, and establishment of a local Water Pan management structure to oversee compliance and sustainable use. Given the dynamic environmental conditions in the ASAL context, the ESMP is designed to be adaptive and subject to periodic review. It shall be shared with the appointed contractor for integration into the Contractor's ESMP (C-ESMP) to ensure effective implementation. The report estimates that, in addition to the contract cost, approximately Kshs. 350,000 will be required during desilting and approximately Kshs. 748,000 will be required construction, at least Kshs 115,000 annually during operation, and Kshs. 205,000 during decommissioning to support environmental management and site rehabilitation measures.

1. INTRODUCTION

1.1 BREFONS Project Background

The Building Resilience for Food and Nutrition Security (BREFONS) project is a key component of a broader regional initiative aimed at tackling food insecurity in the Horn of Africa, particularly in the context of climate change. In Kenya, BREFONS is supported through a loan from the African Development Bank (AfDB) and builds on the foundations laid by earlier efforts such as the Drought Resilience and Sustainable Livelihoods Programme (DRSLP).

As the second phase of DRSLP in Kenya, BREFONS seeks to further strengthen resilience and promote sustainable livelihoods. It integrates insights and best practices from DRSLP-1 and complementary projects like the Small-scale Irrigation and Value Addition Project (SIVAP) and the Rural Livelihoods Adaptation to Climate Change (RLACC), enabling it to apply tested solutions across diverse regions.

The project's primary aim is to enhance resilience to food and nutrition insecurity and the effects of climate change, while also contributing to peace and stability in the Horn of Africa. Its main objectives include boosting sustainable productivity within agropastoral systems, increasing household incomes through value chain development, and enhancing communities' adaptive capacity to climate risks.

In Kenya, the project is implemented by the State Department for Crop Development under the Ministry of Agriculture and Livestock Development (MoALD), with strategic oversight from a steering committee chaired by the Principal Secretary of the department.

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 water pans, livestock sale yards, 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) Summary Report for the *Proposed Desilting and Construction of Nyalilbuch Community Water Pan in Ramor Village, Yatia Location, Baringo North 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 Nyalilbuch Community Water Pan Desilting and Construction Project

The proposed Nyalilbuch Community Water Pan project is located in Ramor Village, Baringo County, and forms part of the broader BREFONS initiative aimed at enhancing resilience and food security among vulnerable communities in the Horn of Africa. This subproject was identified through a community sensitization and prioritization exercise carried out by the Baringo County Government, which selected Nyalilbuch among the five most water-stressed locations in the county for immediate intervention.

Ramor Village currently lacks a reliable source of clean water for domestic and livestock use. The nearest available sources include a borehole known as Karimo borehole which is 7km away and a pan Water Pan in Barkatiew which is 8km away. This has made it difficult for the Nyalilbuch community to access water for domestic uses. Most members spend a lot of time covering long distances to access water. Most school going children tend to go to school late as they prioritize fetching water for the households. The area also lacks a proper access road making it hard for motorbikes to access the homesteads after fetching water. The community members claimed that the lack of access to clean and adequate has slowed down a lot of their activities and even limited them from doing agriculture since there is no water for irrigation.

The desilting and construction of a water pan in Nyalilbuch is therefore expected to significantly improve access to water, reduce the cost and burden of water collection, and promote better hygiene and sanitation. The community has expressed strong support for the project, anticipating that the availability of water will not only meet domestic and livestock needs but also enable small-scale agricultural activities such as kitchen gardens and the cultivation of crops like finger-millet. The reduced distance to water will free up time and resources, contributing to overall improvements in health, livelihoods, and community resilience.

1.3 Justification for the Environmental Comprehensive Project Report

The proposed desilting and construction of the Nyalilbuch Community Water Pan, falls under development activities that require environmental safeguards at the planning stage. In line with the Government of Kenya's policy and the provisions of the Environmental Management and Coordination Act (EMCA) No. 8 of 1999, an Environmental Impact Assessment (EIA) is mandatory to ensure that potential environmental and social impacts are identified and appropriately addressed during the design, construction, operation, and decommissioning phases of the project.

To meet this requirement, a Comprehensive Project Report (CPR) was prepared following a recommendation by the National Programme Coordination Unit (NPCU), Environment Section. The process was guided by the Environmental and Social Management Framework (ESMF) developed under the Building Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS) program, and based on the outcomes of the environmental screening exercise.

The CPR was developed in accordance with the African Development Bank's (AfDB) Integrated Safeguards System (ISS), which applies to all BREFONS-supported sub-projects. Specifically, the report considered the relevant Operational Safeguards: OS 1 on Environmental and Social Assessment, OS 2 on Involuntary Resettlement, OS 3 on Biodiversity and Ecosystem Services, OS 4 on Pollution Prevention and Control, and OS 5 on Labour Conditions, Health and Safety. These safeguards ensure that sub-projects are

designed and implemented in a manner that minimizes environmental harm, promotes sustainable resource use, and protects vulnerable populations.

Furthermore, the preparation of the CPR adheres to the NEMA Public Notice on ESIA requirements as outlined in Legal Notice No. 31 of April 30, 2019, which amended the Second Schedule of EMCA. As per NEMA Legal Notice No. 32, all proponents of projects classified as medium-risk must submit a Comprehensive Project Report for review and approval by the Authority. Given the nature and scale of the proposed water pan, this CPR serves as the appropriate environmental instrument to facilitate regulatory compliance and ensure sustainable project implementation.

1.4 *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 I*), 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 Desilting and Construction of Nyalilbuch Water Pan Project, a Summary 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 Desilting and Construction of Nyalilbuch Community Water Pan Project* lies within Category (1) *medium 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 Baringo - 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.

The proposed project impacts will be site specific, few if any of them are irreversible; and in most cases adverse effects will be limited; (some minor including dust, noise and health and safety impacts during construction and operational phases) and mitigation measures can be designed. Such impacts have been clearly identified both at screening stage and in this CPR report with comprehensive mitigation measures being fully designed and described in ESM&MP.

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 African Development 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 in on 24th 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 via the use of public meetings & questionnaires, key stakeholder and informant interviews were carried out during the exercise. To ensure adequate public participation in the ESIA process, questionnaires were administered to: the project stakeholders, project site neighbours to the *Proposed Desilting and Construction of Nyalilbuch Community Water Pan Project* and other surrounding enterprises (*Appendix I*). The information gathered was subsequently synthesized and incorporated into the ESIA Comprehensive Project Report.

Given the nature of the project and anticipated impacts, one major public meeting was conducted targeting respective members of Nyalilbuch Water Pan Community and the neighbouring community on 24th February 2026 at Ramor Village where 25 participants attended (see attendance list-*appendix III* and minutes of the public consultation meeting-*Appendix II*). This was done in order to incorporate the concerns and views of all persons and individuals in the project neighbourhood. Further, key informant interviews/consultations were conducted to incorporate views from key stakeholders as described in chapter 5.

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 Introduction

This chapter gives details of the project. It highlights the project design and materials supported by the design and plan drawn to scale and signed by an engineer. Additionally, it provides an overview of project activities during construction, operation and decommissioning phases. Included are a project design and layout, description of project activities and an estimate of the cost of putting up the project in the area.

2.2 Project Scope

The scopes of works for this project will include excavation of the reservoir, construction of the embankment, excavation of the spillway and silt trap, planting of grass on the embankment. The works will also include water pan ancillary work comprising; construction of pipe draw off system, spillway concrete sills, cattle trough, communal water points, pit latrine, and fencing of water pan, (see appendix XI on Drawings and Design).

2.3 Project Design and Activities

2.3.1 Project Design

The area being arid, the area experiences little to no rainfall, the community members depend on Karimo borehole and Barkatiew pan Water Pan that are 7 and 8km away respectively as their sources of water. The proposed surface rainwater harvesting technology by constructing a water pan to store rainwater/ surface runoff within a watershed is best suited for developing rural communities that have limited sources of water. Several factors including topography, regional geology, the hydrology of the Nyalilbuch watershed, weather information, the environmental and geotechnical conditions of the water pan were considered in the designing of the proposed water reservoir. The water pan has been designed to meet the existing water and irrigation demand, support upstream conservation measures in the Nyalilbuch zone and reduce flooding in the downstream.

2.3.2 Project Components

The project is made up of the following major components:

- i. Water pan
- ii. Cattle trough
- iii. Shoat trough
- iv. Toilets
- v. Water Pan Site Fence

The proposed project entails desilting and construction of an existing pan to achieve storage of at least 18,250m³. Adopting an 10m³per hour solar pump, the rising water main will be designed for 2 litres per second capacity.

2.3.3 Water Pan Capacity Description

The proposed project entails the construction of an existing water pan to achieve a target storage capacity of 18,250 cubic meters (m³). This intervention aims to improve water security for both livestock and domestic use in an arid and water-stressed region like Baringo County. The pan will be deepened to an average of 4 meters, with engineered side slopes to ensure structural stability, minimize erosion, and reduce sedimentation.

2.4 Storage Design and Surface Area

Given a design volume of 18,250 m³ and an average depth of 4 meters, the estimated surface area of the water pan is approximately:

- 5600m²
- 4.05 hectares
- 10 acres

This allows for an efficient balance between water storage and surface evaporation, which is a critical factor in arid climates.

Community Water Demand Analysis

Based on the existing population of:

- 1,500 cows
- 8,7998 shoats (sheep and goats)
- 546 households (~3, 276 people)

The total daily water demand is estimated as follows:

Table 2.1: Community Water Demand

Use Category	Daily Demand (Liters)	Daily Demand (m ³)
Livestock	8,000	8
Domestic use	12,000	12
Total	20,000	20

Pan Supply Duration (No Refill Scenario)

If no additional inflow (rainfall or runoff) is assumed and water is withdrawn daily at this rate:

$$18,250 \text{ m}^3 / 57.6 \text{ m}^3 \text{ per day} = \sim 317 \text{ days}$$

This indicates that the pan can sustain the community's needs for about 1 year, under ideal storage and zero-loss conditions. However, considering evaporation, seepage, and occasional over-abstraction, the realistic operational lifespan may range between 6 to 9 months without recharge.

Sustainability Considerations

- Evaporation losses in Nyalilbuch area could reach up to 6–8 mm/day, significantly affecting storage, especially in shallow or large-surface-area pans.
- Seepage may occur in sandy or fractured soils unless lining is considered.
- Seasonal rainfall may replenish the pan partially or fully, but variability in rainfall patterns requires robust water management practices.

The proposed 18,250 m³ water pan offers adequate capacity to support a moderate-sized pastoralist community over an extended dry season. With proper operation and maintenance, community sensitization, and equitable distribution systems in place, the pan will serve as a reliable water source for livestock and domestic use, helping build resilience against prolonged drought periods within Nyalilbuch Community.

2.4.1 Irrigable Area

Community expressed the need for water for irrigation of finger millet, maize and beans.

2.4.2 Water Demand Estimates

The water demand for the proposed project is categorized as rural domestic water demand. Water consumption was based on consumption rates recommended in Table 2.2 of the *Practice Manual for Water Supply Services in Kenya, 2005* was used for estimation of water demands.

Table 2:2: Summary Water Demand in Nyalilbuch Zone

Consumer	Unit	Rural areas			Urban areas		
		High potential	Medium potential	Low potential	High class potential	Medium class potential	Low class potential
People with individual	L/head/day	60	50	40	250	150	75

connection							
Consumer	Unit	Rural areas			Urban areas		
		High potential	Medium potential	Low potential	High class potential	Medium class potential	Low class potential
People without connections	L/head/day	20	15	10	-	-	20
Livestock unit	L/head/day	50			-		
Boarding schools	L/head/day	50					
Day schools With WC Without WC	L/head/day	25 5					
Hospitals regional district other	L/head/day	400 200 100 +20 L per outpatient and day [minimum 5,000 l/day]					
Dispensary and health centre	L/head/day	5,000					
Hotels high class medium class low class	L/head/day	600 300 50					
Administrative offices	L/Head/day	25					
Bars	L/day	500					
Unspecified Industry	L/Ha/day				20,000		
Coffee, pulping factories	L/kg coffee	25 [when re-circulation of water is used]					

The Nyalilbuch Water Pan has been designed with a storage capacity of 18,250 cubic meters (m³), which is adequate to meet the estimated daily water demand of 57.6m³ for both livestock and domestic use within the surrounding community. Site assessments confirmed the feasibility of constructing a pan of this capacity at the proposed location. The full reservoir area is approximately 5600 m², with a maximum water depth of 4 meters, tailored to local topographic and hydrological conditions. The system is expected to yield 101 m³ per day under an 8-hour pumping regime, ensuring reliable water supply for most of the year. The

design life of the structure is 20 years, with the primary raw water source being surface runoff collected during seasonal rainfall events.

a. Water pan Freeboard

A minimum freeboard of 1.5m meters has been adopted in the Nyalilbuch water pan design considering that the pan belongs to Class A (Medium Risk) water structures. Pan freeboard is necessary to prevent overtopping and washing out of the embankment due to waves.

b. Silt trap Design

This design recommends silt trap that is 40m long by 30m wide with a side slope 2.5:1 and a silt trap basin 30m long by 20m wide.

2.4.3 Main Project Works/Activities

a) Site Clearance/ Reservoir Extraction (Earthworks)

This will involve clearing the site of trees/ bushes, stumps from the pan area, borrow area and reservoir and cart away (see appendix IX).

b) Silt trap excavation and construction

Excavation will be undertaken in set out area of the silt trap as provided in the engineering drawings. Stone pitching protection of inlet will be provided from silt trap to the base of the reservoir as shall be directed by engineer. The sill will be created using class 20/20 cast concrete. Stone pitching protection to spillway and outflow will be constructed as directed by the engineer.

2.4.4 Climate Proofing

In the design of the Nyalilbuch Water Pan in the Baringo County, climate-proofing measures were integrated to ensure resilience against climate variability and long-term changes. Given the arid and semi-arid nature of Baringo County, which experiences frequent droughts, erratic rainfall, and temperature fluctuations, these design considerations addressed the potential impacts on water resources.

1. Incorporating Rainfall Variability

The design accounted for the region's unpredictable rainfall patterns by incorporating sufficient storage capacity to capture and store runoff during both regular and extreme weather events. Climate projections were used to estimate future rainfall patterns, which

informed the optimal size and capacity of the water pan, ensuring its ability to sustain prolonged dry spells and occasional heavy rainfall.

2. Sedimentation Control and Erosion Management

To address the region's susceptibility to soil erosion and high sedimentation rates, the design included measures such as silt traps, spillways, and vegetation buffer zones. These features were intended to reduce sediment inflow, prolong the water pan's lifespan, and maintain water quality. Plans for regular desilting were also incorporated, allowing for future maintenance in response to climate-induced erosion.

3. Flood Management and Overflow Systems

Flood management was a key consideration, with the design including robust spillways and flood diversion systems to protect the water pan from flash floods caused by intense rainfall. Properly sized overflow structures were incorporated to mitigate the risk of overtopping, which could erode embankments and reduce the pan's functionality.

4. Water Loss Reduction

To minimize water loss due to evaporation, a significant concern in arid regions, protective measures were incorporated into the design, including the installation of windbreaks (encouraging the community members to plant trees) around the water pan. Additionally, the bottom of the water pan was lined with impervious materials to prevent seepage losses, improving overall water retention.

5. Water Conservation Technologies

Water-efficient technologies, such as drip irrigation systems and controlled water distribution points, were integrated into the design to optimize water use and reduce wastage, ensuring that stored water could sustain communities and livestock for longer periods during dry seasons.

6. Sustainable Livestock and Community Watering Points

Separate and properly designed livestock watering points were included to prevent direct animal access to the main storage area, preserving water quality and managing water

distribution during times of scarcity. Community-based water allocation strategies were also developed to ensure equitable access.

2.5 Construction of ancillary structures

The proposed interventions to meet the stakeholders prioritized expectations taking into account the availability of budget include;

- i. Draw off systems
- ii. Spillway.
- iii. Silt trap
- iv. Solar powered pump and solar structure.
- v. Cattle trough.
- vi. Shoat trough
- vii. Water Pan Site fence

2.6 Material and Equipment

The inputs to implementing the proposed project are human labour, plant and machinery, fuel (for excavator) solar water pump, concrete, self-regulatory water valves, Barbed wire, Chain link and paints.

2.7 Project Activities Categories

The activities associated with the proposed project have been categorized under four phases of project implementation namely; planning, construction, operation, and closure/decommissioning as discussed in the following subsections.

2.7.1 Planning Phase Activities

The main activities considered during this phase are: community mobilization, tendering services as required by procurement regulations, site hand over, handover of drawing and building plans and site layout.

2.7.2 Construction Phase Activities

The following works will generally be followed during the construction of the project:

- **Mobilization:** The contractor will provide access for the Construction Camp. He will be required to clear and level the site by: cutting and clearing existing vegetation; removing stumps; leveling the site by grading and filling; and installing site drainage;

- *Setting out:* Once the camp, material storage and parking areas are established, the next task will involve setting out the works, marking and pegging for particular activities;
- *Site clearance and topsoil stripping:* These tasks will be done together with setting out and as per design requirements;
- *Earthworks, excavations, filling of structures, fencing, drainage works:* The above tasks involving excavating, and grading and soil control erosion measures will be done as per the approved design.
- *Handing Over:* At the completion of the works, all structures and equipment not required for the operation and maintenance are removed from the site and the work areas prepared for re-vegetation.

Construction Materials: Construction input material will include gravel, rock, cement, sand, ballast, structural steel, reinforced steel, paint, timber, fuel and lubricants. Consumable materials will include lubricants, greases, chemicals, reagents, resins and others. The construction of the pan will utilize earth fill materials that are available from the pan area within the project site.

2.7.3 Operation Phase Activities

On project completion the facilities would be utilized for the intended purpose. The project operational activities will include: operationalizing a water trough, draw off system, a community water point and toilets.

2.7.4 Decommissioning Phase Activities

Decommissioning of the water pan will become necessary if or when the project goals change, when the need arises, climatic conditions or change of government policy as regards the land use. Once this occurs, the affected structures will be demolished. Non-reusable materials will be sold to licensed scrap metal dealers. The closure of the project will involve stopping all activities and demolishing the built structures and any fences. The affected land shall be, landscaped and replanted with suitable indigenous grass and tree species.

2.8 Proposed Project cost

The costs of establishing Nyalilbuch water pan estimated to have a capacity of ***m³ is Kshs. 18, 284, 929 (Shillings Only) which includes the cost of preliminaries, excavation of the reservoir, spillway and established of ancillary facilities.

3. BASELINE INFORMATION

3.1 Introduction

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 sensitive 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 desilting and construction of the water pan project is located in Baringo County within the North Rift region of Kenya bordering Turkana County to the North, West Pokot to the North West, Samburu County to the North East, and Laikipia County to the East, Nakuru to the South East, Kericho County to the South, Uasin Gishu to the South West and Elgeyo Marakwet to the West.

The Nyalilbuch Community Water Pan Project is a critical water harvesting initiative proposed for Ramor Village, Barkatiaw Sub-location, Yatia Location, Saima Soi Ward, Baringo North Sub - County Baringo County. The site is accessible via the Loruk-Chemolingot road that connects to a feeder road to Nyalilbuch site. The road is, however an earth road and seasonal making it impassable during the heavy rains. The distance from the feeder road to the site is approximately 3-8 km depending on the route chosen. The project location is described by the coordinates 35.858860°E, and 0.7619460°N and approximately 200 meters above Sea level. The project occupies 5 acres of communal land allocated by the community members. A land survey confirmed no private claims or resettlement was needed. The map below and Satellite imagery give a detailed description of the project location.

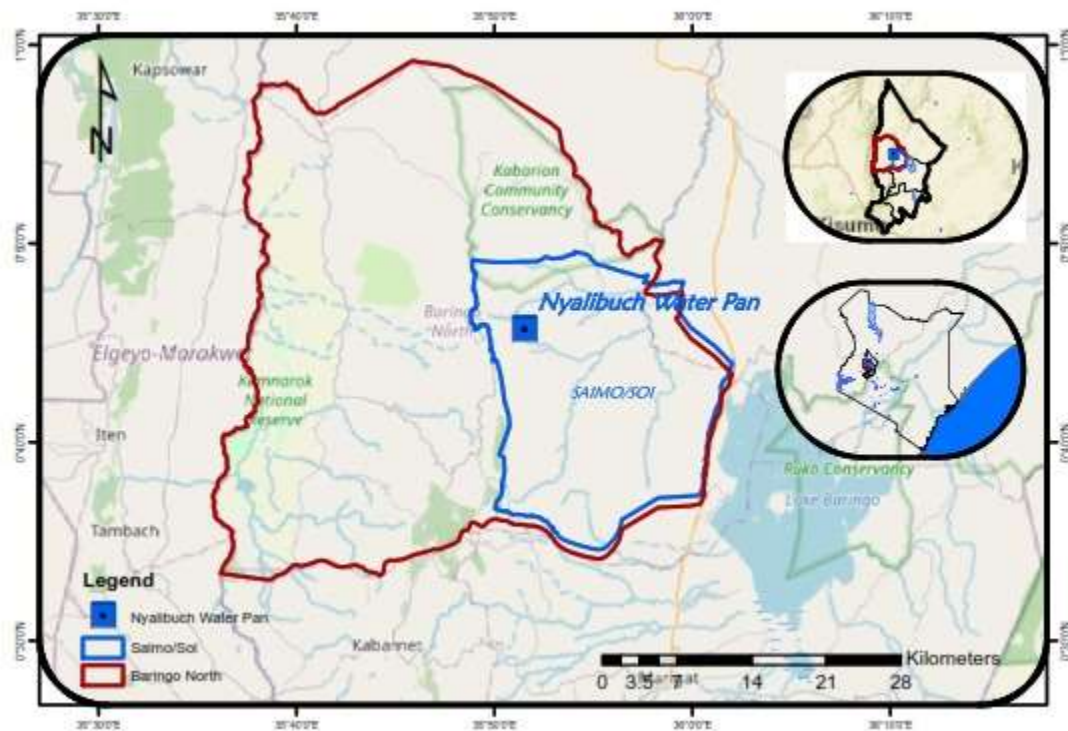


Figure 3.1: Proposed Project Location Map

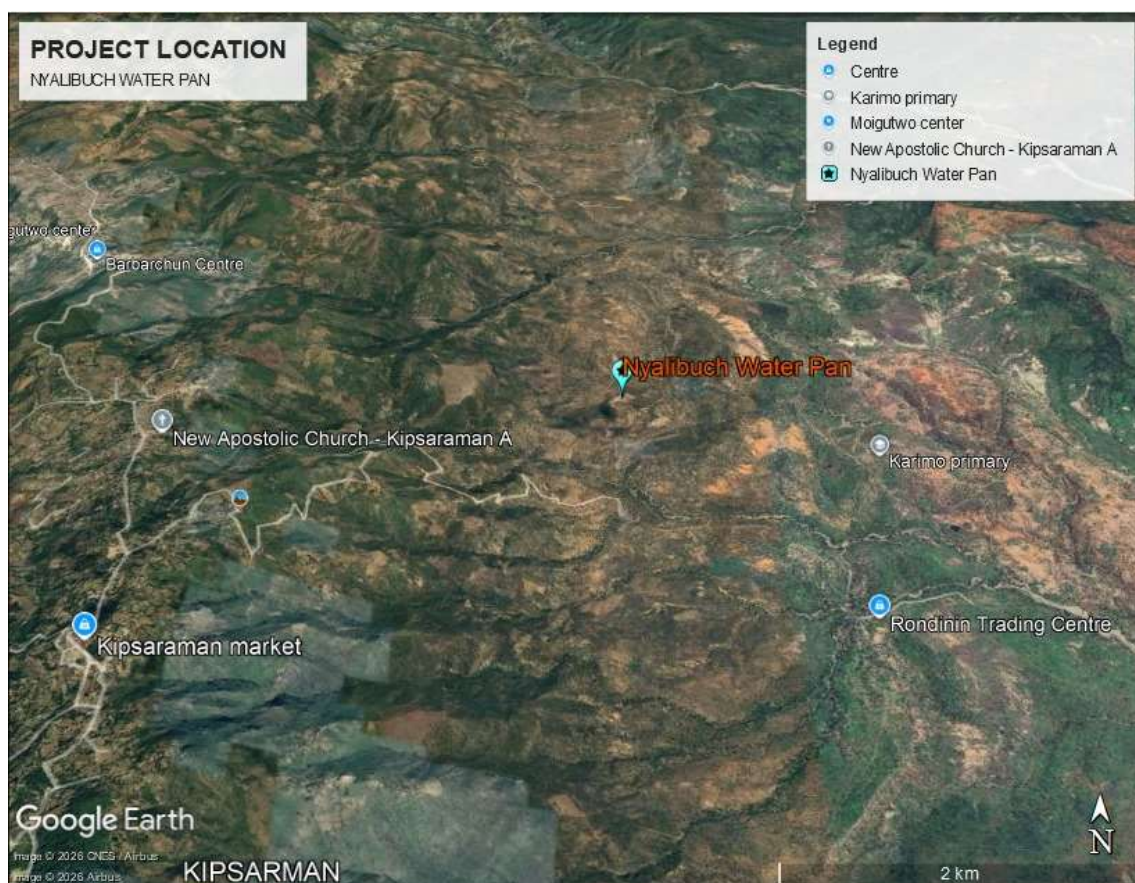


Figure 3.2: Satellite Imagery of the proposed Water Pan (Source: Google Earth, 2026)

3.3 Physiographic and Natural Conditions

3.3.1 Physical & Topographic Features

The Nyalilbuch area in Baringo County is situated within the Rift Valley lowlands, at an approximate altitude of 900–1,100 meters above sea level. The terrain is generally flat to gently undulating, characteristic of the Rift floor, with small seasonal drainage channels and scattered low hills in the surrounding landscape. The soils are primarily alluvial deposits from seasonal runoff and weathered volcanic materials, which influence water retention and siltation patterns in the area. Vegetation is dominated by semi-arid grasslands and thorny bush, while localized riparian zones around the Nyalilbuch water pan support denser, moisture-loving plants that provide critical habitat for birds and small wildlife. The combination of gentle relief, fertile alluvial soils, and proximity to a water source makes the site suitable for livestock watering and limited small-scale cultivation, while also being sensitive to erosion and seasonal flooding.

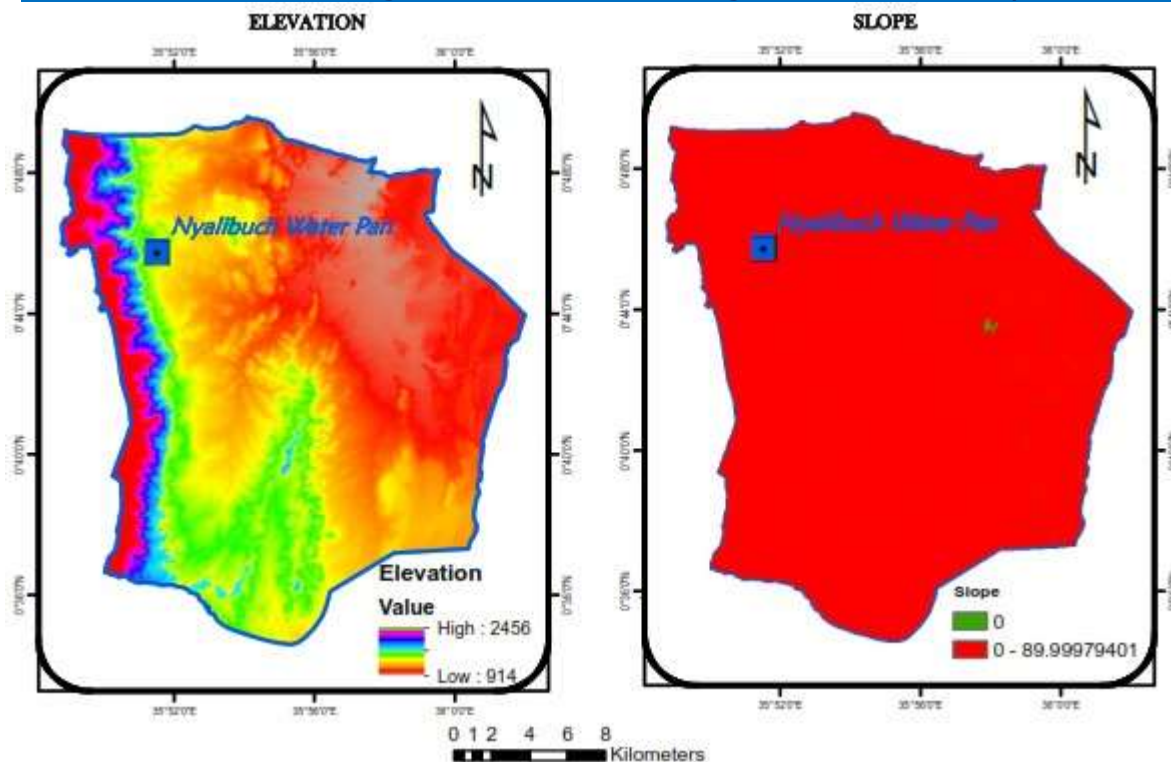


Figure 3.3: Topography and terrain of the area

3.3.2 Geology and Soils

The Nyalilbuch area in Baringo County lies within the Kenyan Rift Valley system, which is characterized by faulting and past volcanic activity. The geology is mainly composed of volcanic rocks such as basalts, trachytes and tuffs, overlain in low-lying areas by more recent alluvial and lacustrine sediments. These sediments have accumulated in depressions formed by rift-related processes, creating favorable conditions for seasonal water pans and wetlands.

Soils in the area are largely influenced by volcanic parent material and semi-arid climatic conditions. In lower plains, deep silty clay and clay loam alluvial soils dominate, often with moderate water-holding capacity but poor drainage. On slightly elevated ground, reddish clay loam soils derived from weathered volcanic rocks are common, generally low in organic matter and susceptible to erosion when vegetation cover is removed. Localized salinity may occur in poorly drained depressions due to high evaporation rates.

These geological and soil conditions affect water pan development and management. Fine-textured soils contribute to siltation during heavy runoff, requiring regular desilting. Clay-rich soils can reduce seepage but may weaken when saturated, making proper embankment compaction and slope stabilization essential. Vegetative buffers and drainage control measures are therefore important to maintain long-term structural stability and water quality.

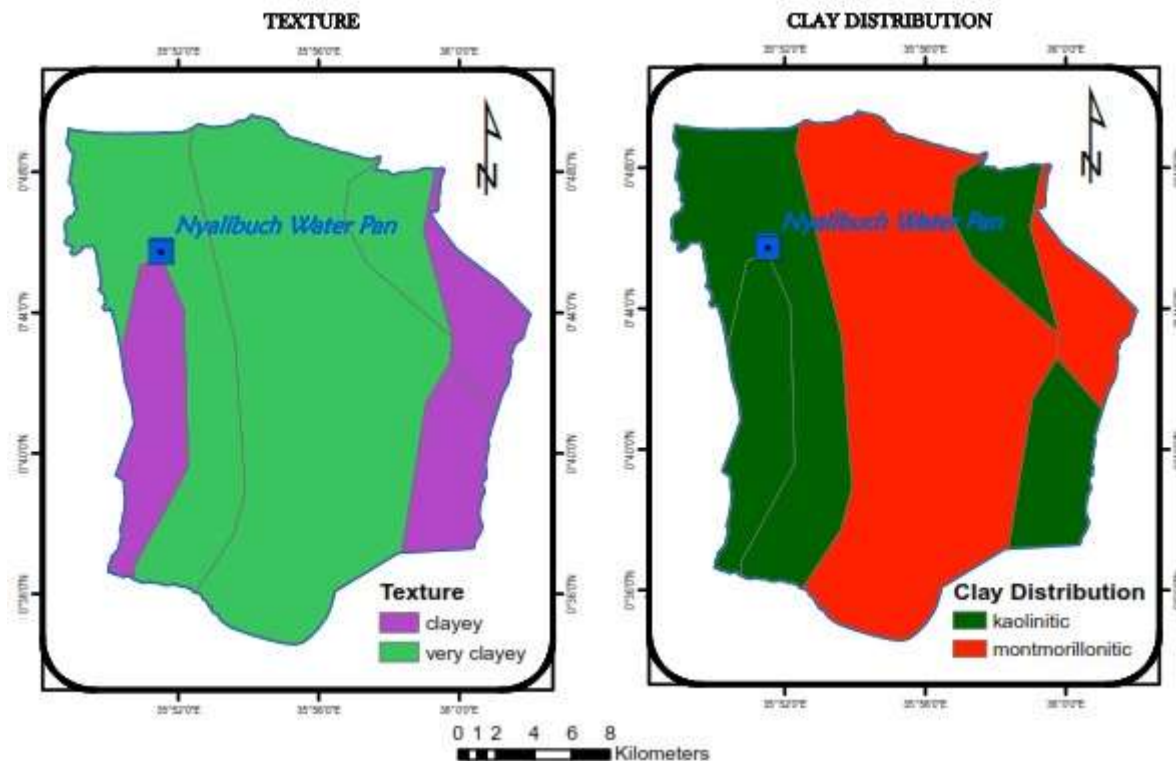


Figure 3.4: Soil map of the project area

3.3.3 Biodiversity

The Nyalilbuch area in Baringo County falls within a semi-arid rangeland ecosystem typical of the Rift Valley floor. Vegetation is mainly composed of Acacia–Commiphora bushland interspersed with open grasslands and seasonal herbaceous cover. Common plant species include drought-tolerant shrubs and grasses adapted to low rainfall and high temperatures. Around the water pan itself, riparian and moisture-loving vegetation such as sedges and scattered trees may occur, forming a localized micro-habitat distinct from the surrounding dry landscape.

Faunal diversity is strongly influenced by the availability of water, especially during dry seasons. The water pan attracts livestock as well as wild herbivores, small mammals, reptiles and a variety of bird species. Water-dependent birds such as ducks, herons and weavers are commonly observed, while raptors may utilize nearby trees for nesting and hunting. The presence of seasonal wetlands increases ecological productivity by providing breeding and feeding grounds for aquatic and semi-aquatic organisms.

Overall, biodiversity in the area is moderate but ecologically significant due to the scarcity of permanent water sources. The water pan serves as a critical refuge during drought periods, supporting both domestic and wild species. However, the ecosystem is sensitive to overgrazing, vegetation clearing and water contamination, which can reduce habitat quality and species diversity if not properly managed.



Figure 3.5: Project Environment

3.3.4 Climatic Conditions

The Nyalilbuch area in Baringo County experiences a semi-arid to arid climate, typical of the Rift Valley floor. Rainfall is generally low and unreliable, averaging approximately 500–800 mm per year, depending on elevation and proximity to escarpments. The area experiences a bimodal rainfall pattern, with the *long rains* occurring between March and May and the *short rains* between October and December. However, rainfall distribution is highly erratic, and prolonged dry spells are common, contributing to recurrent drought conditions.

Temperatures are generally high throughout the year due to the county's low altitude and semi-arid setting. Mean annual temperatures range between 24°C and 30°C, with daytime temperatures often exceeding 32°C, particularly during the dry season (January–March). Night-time temperatures are relatively warm, rarely dropping below 18°C in lowland areas. High evaporation rates, driven by elevated temperatures and strong solar radiation, significantly influence surface water availability and contribute to rapid water loss from open water bodies such as pans.

Climatic variability plays a critical role in shaping local livelihoods and environmental conditions. Low and unpredictable rainfall affects vegetation cover, livestock productivity and water recharge, while high temperatures increase evaporation and soil moisture deficits. These climatic characteristics make water pans essential for sustaining communities and livestock, especially during extended dry periods.

3.4 *Socio-economic Environment*

3.4.1 Population

According to the 2019 Kenya Population and Housing Census, Baringo County had a total population of 666,763 people, with 336,322 males (50.4%) and 330,428 females (49.6%). The county has a predominantly young population, with approximately 296,178 children aged 0–14 years and an estimated 260,238 youth aged 15–34 years, representing about 39% of the population. This demographic profile reflects a nearly balanced gender distribution and a large proportion of young people, which has implications for resource use, infrastructure planning, and social services in areas such as Nyalilbuch.

3.4.2 Water and Sanitation

Water and sanitation in the Nyalilbuch area of Baringo County are constrained by the semi-arid climate and limited infrastructure. The community relies on surface water sources like the Nyalilbuch water pan, seasonal rivers, and shallow wells. On average, households use 20–30 liters per person per day, while cattle require 50–100 liters per head per day, making careful water management essential.

Sanitation is limited, with few improved pit latrines and widespread open defecation, increasing the risk of waterborne diseases such as diarrhea and typhoid. Rainy season runoff further contaminates water sources, highlighting the need for safe water handling and hygiene practices.

Community initiatives focus on constructing public toilets, separating livestock and human water points, and promoting hygiene education. Proper management of the water pan, regular desludging of latrines, and water quality monitoring are critical to ensuring safe water use and protecting public health.

3.4.3 Land Use

The land in the Nyalilbuch area of Baringo County is predominantly used for agriculture, livestock grazing, and settlement, reflecting the semi-arid nature of the region. The lowland plains around the water pan are mainly pastoral rangelands, supporting cattle, goats, and sheep, which are central to local livelihoods. Small-scale crop cultivation occurs in areas with relatively fertile alluvial soils and near seasonal water sources, typically involving drought-tolerant crops such as maize, sorghum, millet, and vegetables.

Riparian zones and areas adjacent to the water pan support moisture-loving vegetation and are sometimes used for small garden plots or fodder production, providing both ecological and economic benefits. Open grasslands and bushlands dominate higher ground, often left as communal grazing land or conserved for wildlife habitat.

Human settlements in the area are generally sparse and dispersed, concentrated near water sources, roads, and trade centers. Land use practices are influenced by seasonal rainfall, soil fertility, and accessibility, with competition between livestock grazing, small-scale farming, and conservation of natural vegetation. The presence of the water pan itself also encourages more intensive land use around its immediate vicinity, including community grazing, watering points, and small-scale irrigation plots.

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 Nyalilbuch water pan desilting and construction 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 Saima Soi 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 vision 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 implementation of the proposed water project is an effort to increase agricultural productivity investing in water for irrigation and livestock.

4.2.3 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.

4.2.4 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.

4.2.5 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 water pan to avoid contamination of the water source.

The water pan also contributes towards achievement of this policy through provision of safe water to area residents for livestock and domestic consumption.

4.2.6 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.

The upgrading of the water pan is a major contribution towards meeting the objectives of the policy including achieving food security and rural income. Local farmer will enhance productivity of dairy cow (milk) value chain through the provision of water.

4.2.7 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.

4.2.8 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.

4.2.9 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.

4.2.10 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 Water pan 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 Nyalilbuch water pan.

4.2.11 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.

Desilting and construction of Nyalilbuch water pan 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.

4.2.12 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 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 signage at critical points, sealing the pan construction area to avoid unauthorized entry and accidents

4.2.13 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 and reserved for purposes of the water pan. Construction of the pan ensures the land is put into productive use.

4.2.14 Baringo County HIV and AIDS Strategic Plan 2016/2019

The Baringo County HIV and AIDS Strategic Plan 2016/2019 aims to reduce new HIV infections, improve care for those living with HIV, and address social and economic impacts. It focuses on prevention through education and testing, expanding treatment access, supporting affected populations, enhancing coordination among stakeholders, and implementing rigorous monitoring and evaluation. This comprehensive approach seeks to enhance health outcomes and well-being across the county.

The proponent will refer to this strategic plan in planning for implementation of measures in this CPR and ESMP on HIV/AIDS such as on stakeholders to engage in implementation and on objectives set in the strategic plan.

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 desilting and Construction of the Nyalilbuch water pan is categorized a community project and medium risk project. The new regulation provides for preparation and submission of Comprehensive Project Reports (CPR) for medium-risk projects. Section 58 (1) of the act requires that the proponent of the medium-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 water pan wall.

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 muffs 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 water pan 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 desilting and construction of Nyalilbuch water pan 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 pan 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 water pan shall be in line with the regulation classification of the water pan as medium 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 condition 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 unrecyclable 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 Ramor Village, where there is an already existing water pan 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 CPRings 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 water pan 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 water pan; 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 (DOSHS)

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 offenses on minor (children).

The Proponent will develop and implement a Sexual Exploitation and Abuse (SEA) Action Plan, including an Accountability and Response Framework (ARF), as an integral part of the Construction Environmental and Social Management Plan (C-ESMP). This plan will be guided by the provisions of the Sexual Offences Act, 2006 (as amended in 2016), which defines and criminalizes a wide range of sexual offences, particularly those involving minors, and aims to protect all persons from unlawful sexual acts.

In line with the African Development Bank's Integrated Safeguards System (ISS) and relevant national policies, the SEA Action Plan will establish measures for preventing, mitigating, and responding to SEA/SH (Sexual Exploitation, Abuse, and Harassment) risks during project implementation. It will include awareness and sensitization campaigns for workers and communities, a confidential grievance and reporting mechanism, and clear procedures for case management and referral, ensuring compliance with both AfDB standards and good international industry practice.

4.3.10.2 *HIV 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

The National Museums and Heritage Act, 2006 provides the legal framework for the identification, protection, conservation, and promotion of Kenya's cultural and natural heritage. It mandates the safeguarding of heritage resources including archaeological sites, cultural landscapes, monuments, and traditional practices, and repeals earlier laws such as the Antiquities and Monuments Act and the National Museums Act.

In line with the African Development Bank's Operational Safeguard 1 (OS1): Environmental and Social Assessment, which requires the protection of physical cultural resources during project implementation, the Proponent will ensure that all activities respect and preserve both tangible and intangible heritage.

The Contractor will implement a Chance Find Procedure in the event that previously unidentified heritage resources are discovered during construction. This procedure, guided by Kenyan legal requirements and AfDB safeguard principles, outlines the steps for reporting, securing, and handling such discoveries to prevent Water Panage or loss. (See Appendix VII for Kenya's Chance Find Procedure.)

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 Water Pan 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 water pan 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, controllers, and solar panels.

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 water pan 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 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 water pan desilting 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.

4.4.2 Program to Build Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS)

The Building Resilience for Food and Nutrition Security in Kenya (BREFONS Kenya) Project is responsible for the day-to-day implementation of activities in Baringo County. The project conducts participatory monitoring and evaluation with local communities to ensure accountability and effectiveness. BREFONS Kenya plays a key role in conflict resolution facilitation, promotes social inclusion, and ensures that all interventions are technically sound, environmentally sustainable, and aligned with sustainable development goals.

The project places deliberate focus on mainstreaming gender equality, empowering marginalized and disadvantaged groups, and integrating HIV/AIDS awareness and prevention across all project components.

Under the water infrastructure component, BREFONS Kenya supports the construction and effective management of water pans to address community water needs domestic use, livestock watering, and small-scale irrigation. The programme ensures that local communities actively participate in the monitoring and evaluation of water pan projects, aligning outcomes with community priorities and strengthening local ownership and sustainability of water resources.

4.4.3 African Development Bank (AfDB)

The African Development Bank (AfDB) requires all projects it finances to undergo thorough Environmental and Social Impact Assessments (ESIAs) to ensure that potential environmental and social risks are effectively identified, assessed, and mitigated. These assessments are anchored in the Bank's Integrated Safeguards System (ISS), which provides a comprehensive framework for managing environmental and social risks throughout the project lifecycle.

In Kenya, AfDB-funded projects must comply not only with the ISS requirements but also with the provisions of the Environmental Management and Coordination Act (EMCA) Cap 387, which is the primary environmental legislation governing ESIA in the country. This means that all ESIA studies must be prepared in line with National Environment Management Authority (NEMA) regulations, including submission for review and approval before project implementation can proceed.

A critical component of the AfDB ESIA process is public participation and stakeholder engagement. This ensures that communities, including women, youth, marginalized and vulnerable groups, are actively involved in identifying potential risks and shaping project interventions. The process also emphasizes the preparation of Environmental and Social Management Plans (ESMPs), which outline mitigation measures, monitoring responsibilities, and institutional arrangements necessary for effective implementation.

All ESIA reports for AfDB-funded projects are subject to mandatory disclosure, both locally and on AfDB platforms, typically for a period of at least 30 days prior to project appraisal. This reinforces transparency and strengthens the accountability of project implementers.

By harmonizing AfDB's safeguard policies with Kenya's ESIA requirements, projects are better positioned to meet both national environmental standards and international best practices, thereby ensuring long-term social, economic, and environmental sustainability.

4.4.4 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.

4.4.5 Water Resource Users Association (WRUA)

WRUAs are local community institution established under the Water Act, which work with WRA to manage water resources at the grass-root level. The county in partnership with WRA will support the establishment of WUAs to support management of water resources in the project area.

The proponent will collaborate with the established WUA for effective and successful implementation of management of the proposed water project and efficient utilization of the water and activities such as tree planting in the Nyalilbuch water pan. WRA will undertake capacity building for the established WUA, Nyalilbuch Water Pan Management Committee to enhance sustainable management of the project and the catchment of the water pan.

4.4.6 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 provide 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.

4.4.7 Department of Occupational Health and safety (DOSHS)

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.

4.4.8 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.

4.4.9 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 Environmental and Social Framework (ESF)

The African Development Bank (AfDB) Environmental and Social Framework (ESF) offers a structured and comprehensive approach to managing environmental and social risks in development projects. The Proposed Desilting and Construction of the Nyalilbuch Community Water Pan in Baringo County falls under the category of rural water infrastructure development an activity that must comply with both Kenya's Environmental Management and Coordination Act (EMCA), Cap 387, and the AfDB's Integrated Safeguards System (ISS).

This framework is essential for ensuring that the project is not only technically feasible and financially sound, but also environmentally sustainable, socially inclusive, and responsive to the needs and vulnerabilities of the local community.

The following outlines the relevance of each of the five Operational Safeguards (OS) under the AfDB ISS in the context of this water pan project:

4.5.1 OS 1: Environmental and Social Assessment

Relevance:

This safeguard ensures that a full Environmental and Social Impact Assessment (ESIA) is carried out to identify, predict, and evaluate the potential environmental and social effects of the water pan construction.

In Nyalilbuch, this means evaluating impacts such as clearing of natural vegetation, changes to surface runoff, sedimentation, and disruption to traditional land use. It also includes community consultation, identifying vulnerable groups, and integrating their concerns into project design.

4.5.2 OS 2: Involuntary Resettlement: Land Acquisition, Population Displacement and Compensation

Relevance:

Although physical displacement is unlikely, the water pan may affect access to communal grazing land or alter traditional movement patterns for pastoralists.

This safeguard ensures that any potential economic displacement, loss of access, or land-use conflicts are addressed through participatory planning, livelihood restoration, and grievance redress mechanisms.

4.5.3 OS 3: Biodiversity and Ecosystem Services

Relevance:

The construction site may be home to native vegetation, important bird species, or seasonal water-dependent ecosystems.

This safeguard ensures that the project avoids or minimizes harm to local biodiversity, protects water catchment integrity, and prevents degradation of surrounding habitats. It supports practices like buffer zone creation, controlled excavation, and post-construction site restoration.

4.5.4 OS 4: Pollution Prevention and Resource Efficiency

Relevance:

During construction, risks of oil spills, construction waste, dust, and water pollution may arise.

This safeguard ensures proper waste disposal, dust suppression, equipment maintenance, and efficient use of materials and water. It promotes low-impact construction techniques and encourages reuse of excavated soils for embankment formation or agricultural improvement.

4.5.5 OS 5: Labour Conditions, Health and Safety

Relevance:

Labourers and local workers involved in construction must be protected from hazards such as equipment-related injuries, heat exposure, or unsanitary conditions.

This safeguard enforces decent working conditions, provision of personal protective equipment (PPE), occupational safety training, and community health measures, including HIV/AIDS awareness, gender-based violence prevention, and first aid preparedness.

4.5.6 Cross-Cutting Themes: Gender, Vulnerability, and Climate Resilience

The AfDB ESF emphasizes the need to mainstream gender equality, especially in water access and management. Special attention is given to women, youth, the elderly, persons with disabilities, and marginalized pastoralist groups.

Given the increasing frequency of droughts in Baringo, the project must also integrate climate-resilient design such as optimizing the pan's storage capacity, reinforcing embankments, and ensuring year-round usability.

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 Nyalilbuch water pan, 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 Nyalilbuch water pan 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 PROJECT ALTERNATIVES

5.1 *Introduction*

This section analyzes the viable alternatives to the proposed desilting and construction of the Nyalilbuch water pan project. The aim is to assess other options in terms of feasibility, cost, sustainability, environmental impact, and socio-economic benefits to determine the most appropriate course of action for improving water access in Ramor Village.

5.2 *Alternative Location*

The current location within Ramor Village was selected following a community sensitization and project prioritization exercise led by the Baringo County Government. Ramor was identified as one of the four most water-stressed communities in the county, making it a high-priority intervention site under the BREFONS initiative.

In addition to community prioritization, technical teams comprising engineers and surveyors conducted a topographical survey in the area. The results of this survey confirmed that the proposed site in Ramor Village offers optimal conditions for the construction of a water pan. Factors considered included natural drainage patterns, surface runoff potential, soil suitability, proximity to beneficiaries, and availability of land. The combination of community need and technical feasibility makes the proposed location the most appropriate and viable site for the project.

Alternative locations within or outside the village were assessed but found to be either topographically unsuitable, too far from the target population, or located on contested or unavailable land. As such, the selected site is considered the best option for maximizing impact, sustainability, and community ownership.

5.3 *Alternative Water Sources*

5.3.1 *Exploitation of groundwater*

A borehole constructed at Karimo village exists 10 km away but produces saline water unsuitable for drinking. Drilling a new borehole in Nyalilbuch is costly and uncertain due to the high risk of hitting saline aquifers, common in the region. Groundwater exploitation was therefore deemed unreliable and economically unfeasible for this location.

5.3.2 *Source water from elsewhere*

Walking long distances to access water is currently practiced as the available water sources are 7-8km away and even then the water is not the best quality and is unsustainable. It increases community dependency on external sources and does not offer a long-term solution.

5.3.3 Roof water Catchment

Roof catchment is not viable as a primary source due to the low and unreliable rainfall in Baringo County. Moreover, many households have limited roofing infrastructure, making this method inadequate for meeting the community's domestic and livestock water needs.

5.4 *The No Project Alternative*

If the water pan is not constructed, the community will continue walking long distances to access water as the terrain does not favor many modes of transport. This will sustain poor hygiene conditions, limit agricultural opportunities, and maintain the existing cycle of poverty and water stress. The 'No Project' option would result in continued hardship and lost development potential for Ramor Village.

5.5 *Construction of the existing the Water Pan*

The proposed water pan in Ramor Village is a rehabilitation through desilting and further expansion through construction. The area has had the water pan since 2005 but because of breakage and siltation, the water has not been very good for most domestic use. The need for the water pan emerged from a combination of community consultations and technical assessments, which confirmed the site's suitability for such an intervention.

The proposed construction will involve land clearing, excavation using machinery, installation of inlet and outlet structures, construction of livestock watering points (troughs), and fencing to protect the pan from contamination. Given the severity of water scarcity and the poor condition of the already existing one, the rehabilitated and expanded water pan will serve as the first major community-managed surface water source.

While the current phase focuses on desilting and construction, further expansion may be considered based on the performance and demand arising from increased usage, particularly for small-scale irrigation and livestock. The water pan is expected to bring long-term benefits in terms of water access, hygiene, food security, and livelihood diversification.

5.5.1 Alternatives construction method- manual vs machines

This option considered the use of manual labour in the construction of the water pan. The choice is not considered to be feasible as it would require a very large workforce to excavate the water pan of the proposed capacity (18,250m³) to reduce the number of man hours and the duration to complete the work. The safety of the water pan will not be guaranteed due to the limitation of human labour and such a large work concentrated in one place will result in the degradation of the environment that is besides increased cases of communicable diseases. The use of machinery is therefore, considered as a suitable alternative in terms of efficiency, effectiveness, quality and timelines of completing the

work. However, use of human labour will be necessary particularly for project auxiliaries such as construction of water trough, latrine, installation of the water pump and solar panels among others.

5.5.2 Alternative utilization- Direct fetching from the water pan vs draw points

This involves allowing the community and the livestock to obtain water directly from the water pan which is already happening. Direct fetching from the water pan has proven unsuitable as it has resulted in the contamination and pollution of water and erosion and destruction of the water pan walls and eventual breakage.

5.5.3 Alternative Construction Materials

In evaluating the design and cost-effectiveness of the Nyalilbuch Community Water Pan, the choice of construction materials plays a critical role in ensuring both structural integrity and economic feasibility. A key consideration in this regard is the availability of suitable construction materials within or near Ramor Village, Baringo County, in order to reduce transport costs and support local economic participation.

Compacted Soil and Clay Liners

One of the most commonly used materials for lining water pans in arid and semi-arid regions is compacted clay-rich soil, due to its low permeability and widespread availability in rural areas. In Baringo County, alluvial and volcanic-derived soils are common, and some areas contain clay-rich deposits suitable for water retention. However, the presence and suitability of clay for lining at specific sites such as Ramor Village would need to be confirmed through localized geotechnical or soil investigations, including tests for plasticity, permeability, and compaction characteristics.

If suitable clay is identified locally, it would serve as a cost-effective and technically appropriate option for lining the base and embankments of the water pan, reducing seepage losses and extending the useful life of the reservoir. Similarly, clay-rich local soils, if properly tested and compacted, could serve as effective natural liners, eliminating the need for imported synthetic materials.

Rock Materials for Riprap and Gabions

Baringo County is characterized by a generally rocky terrain, which may present opportunities to source stone or boulders for constructing riprap protection and gabion structures, particularly along embankments and spillways. These elements are essential for preventing erosion and enhancing structural stability, especially during peak runoff events. If quarries or rocky outcrops exist within reasonable proximity to the site, the use of local rock would be both environmentally appropriate and cost-saving. However, transport logistics and access to quarrying equipment would need to be considered.

Concrete Components

Concrete is often required for constructing spillways, inlet structures, and outlet drains. While cement is not manufactured locally in Baringo and would need to be transported from larger towns (e.g. Nakuru), sand and coarse aggregates may be available locally, subject to quality verification. The use of concrete introduces higher costs due to the transport of cement and batching logistics, but it offers durability and long-term performance for critical control structures.

Geomembrane Liners

Synthetic geomembranes (such as HDPE liners) offer highly effective impermeability and long-term durability but are not locally available. These would need to be procured from major suppliers based in urban centers or imported from international vendors. The use of geomembranes would introduce significant upfront costs, including purchase price, transport, and specialized installation, making them less feasible for community-based or budget-constrained projects unless durability and water retention are of utmost priority.

Material Selection Considerations

A thorough geological and geotechnical survey of the Nyalilbuch project area is recommended to verify the presence and suitability of:

- Clay-rich soils for natural lining,
- Local stones or boulders for riprap and gabion construction,
- Sand and aggregates for concrete works.

This should be complemented by consultations with local suppliers, community leaders, and contractors to assess the availability, accessibility, and affordability of each material type. Environmental considerations, such as avoiding over-extraction and ensuring sustainable use of natural resources, should also be factored into material sourcing decisions.

6 PUBLIC PARTICIPATION & STAKEHOLDER CONSULTATIONS

6.1 Introduction

The Kenyan government has enshrined the need for human societies' involvement in project development in the Constitution. This has been set out in the EMCA, 1999 and Environmental (Impact and Audit) Regulations, 2003. The proposed project has incorporated public consultations in order to understand the local impacts, needs and wishes of the community and eventually incorporate them into the final designs and operations of the project.

6.2 Objectives

The key objectives of the consultation and public participation for proposed desilting and construction of Nyalilbuch Water Pan Project was to:

- i. Disseminate and inform the public and stakeholders about the project with special reference to its key components and description
- ii. Create awareness among the public on the need of the ESIA for the proposed project
- iii. Gather comments, suggestions and concerns of the interested and affected parties
- iv. Incorporate the information collected in the ESIA
- v. Build community consensus and acceptance of the proposed project

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 stakeholder 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. Samples of filled questionnaires administered in the project area are appended to this report (*Appendix I*).

6.3.2 Key Informant Interviews

Key stakeholder interviews and consultations were conducted on the 24th February 2026. The key stakeholder engagements were conducted to foster better and mutual understanding of public concerns as well as incorporate key stakeholders' opinions to this report.

6.3.3 Public Consultation Meetings

ESIA questionnaires were administered, to gather information from 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 I*). In seeking the views of the key stakeholders, and any other would be affected/interested parties, the consultant organized a consultative meeting targeting mainly Nyalilbuch Water Pan Project Members and community members surrounding the Proposed desilting and construction of the Nyalilbuch Water Pan project comprised of the elderly, women, youth, people with special needs (Vulnerable and Marginalized groups) and the local administration, were in attendance during the meetings that took place on 24th February, 2026. The meeting was used to publicize the proposed desilting and construction of Nyalilbuch Water Pan 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 analyzed in consultation with the proponent.

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 attended and the attendees participated actively during the meetings (*See Minutes Appendix II and List of Participants in Appendix III*).



Plate 6:1: An ESIA expert leading the public baraza at Ramor Village



Plate 6.2: Women taking part in the public participation forum.

6.4 Consultation and Disclosure Outputs

The appendices present the information on the public consultations undertaken under the environmental impact assessment for the Proposed desilting and construction of Nyalilbuch Water Pan Project. This information includes selected responses as detailed in the minutes (*Appendix II*). 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 6-1 below:

Key Issues from Public Participation Forum (Baraza)

Table 6.1: Summary of Issues Raised by the Community and Stakeholders and Response

KEY ISSUE	QUESTIONS FROM THE COMMUNITY	RESPONSE FROM THE CONSULTANT TEAM
Risk of increased human-wildlife conflict	Community members living near the wildlife corridor raised fears that expanded water during dry spells would attract more wild animals (e.g. monkeys, crocodiles) closer to their homes and farms,	The ESIA expert acknowledged this risk and committed to recommending the installation of appropriate wildlife-friendly barriers (e.g., a buffer zone with deterrent vegetation).

	increasing the risk of crop raiding and danger.	
Influx of Non-Local Workers and Social Strains	Concerns were raised that an influx of external construction workers could lead to increased pressure on local resources, potential communicable disease spread (e.g., HIV/AIDS), and social tensions with the host community	The Consultant assured the community that they will recommend enforcing of Worker's Code of Conduct to the contractor prioritizing local hiring to minimize influx. Additionally, will advise a community health and safety awareness program to be implemented, and regular engagement with local leaders be held to address any emerging social issues promptly.
Water contamination during construction	Community members raised concerns water being contaminated during the construction process from fuel leaks from the heavy machinery used due to possible poorly maintained machinery, fueling or possible machinery servicing while on site.	The ESIA Consultant acknowledged the concern and assured that the site will have designated fueling areas away from the pan, the construction team will have spill kits on site, machinery will be regularly serviced and inspected and servicing will be prohibited within 50m of the pan.
Occupational health and safety risks	Community members raised concerns in exposure to hazardous materials such as fumes from the machines during operations that could lead to long term health issues	The ESIA consultant was in agreement with the issue raised but assured strong recommendations that involved the construction team to provide the needed PPEs, install warning signage, fencing of deep excavations, conduct toolbox safety talks also have trained personnel on Fire safety, first aid and occupational health and safety while on site.
Increased risk of conflicts	Concerns were raised about possible conflicts over water use for domestic, livestock, and	The Client emphasized that a community-based water management committee should be formed after the project has been handed over to the community to help oversee equitable water allocation and develop simple water-use rules to

	irrigation purposes.	minimize conflicts.
Land Encroachment	Some members sought clarification on land encroachment and whether the desilting works would affect private land nearby	It was clarified that the Water Pan is located on voluntarily donated land and no additional land acquisition is anticipated.
Construction Impacts (Dust, Noise, Access)	Members expressed concern about dust, noise, and temporary disruption during construction.	The Contractor will implement mitigation measures including controlled working hours, watering of access roads to suppress dust, and adherence to occupational health and safety standards.
Employment Opportunities	Youth and women asked whether they would be given priority for employment during construction.	The Consultant promised to recommend that priority be given to the locals for unskilled and semi-skilled labor opportunities.
Environmental Degradation	Participants raised concerns about destruction of vegetation and disturbance to wildlife.	The Consultant explained that vegetation clearance will be minimized, disturbed areas rehabilitated after construction, and no protected or endangered species will be affected.
Operation and Maintenance	Members asked who would be responsible for maintaining the water pan after desilting and expansion.	It was explained that the community, through a registered management committee, will be trained on operation and maintenance, with support from the County Government and project partners.

Project Timeline	Community members asked how long the desilting works would take.	The Project coordinator stated that they are yet to get clarification on the project timelines and will give feedback as soon as possible. However, he stated that the usual timeline is 4 months
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6.5 Salient Issues

6.5.1 Opinion on Project Implementation

It was clear from the questionnaires received back that the *desilting and construction of Nyalilbuch Water Pan Project* will serve an important role of providing the community with both domestic and livestock water. This will also reduce trekking distances and enable women and children more time at home performing other chores. All the residents admitted that they were interested in this project more solely for their increased resilience during drought periods and generally improved agricultural productivity.

6.6 Anticipated Impacts

6.6.1 Positive Impacts

Positive impacts identified by stakeholders include the following:

- **Improved Water Security:** Restoration of the Water Pan will ensure reliable access to water for domestic use, livestock watering, and small-scale irrigation, particularly during prolonged dry seasons.
- **Enhanced Agricultural Productivity:** Availability of water for irrigation is expected to support increased production of finger-millet, beans, maize and other crops, leading to improved household food security and nutrition.
- **Improved Livelihoods and Income:** Increased agricultural output and livestock productivity will enhance household incomes and reduce vulnerability to climate-related shocks.
- **Reduced Water Collection Burden:** The project will significantly reduce the distance and time spent, especially by women and children, in fetching water, allowing more time for productive and educational activities.
- **Improved Livestock Health:** Reliable water supply will reduce livestock mortality and improve animal health and productivity, particularly during drought periods.
- **Strengthened Climate Resilience:** Increased water storage capacity will enhance the community's resilience to recurrent droughts and erratic rainfall patterns experienced in the area.
- **Community Empowerment and Ownership:** Community involvement in operation and maintenance will strengthen local capacity, ownership, and long-term sustainability of the water infrastructure.

- **Environmental Improvement:** Proper management of runoff and controlled abstraction will reduce soil erosion and environmental degradation around the Water Pan area.
- **Support to Vulnerable Groups:** Improved access to water and enhanced food production will positively impact vulnerable households, including women-headed households and youth.

6.6.2 Anticipated Negative Impacts

Some of the negative impacts identified include the following:

- **Vandalism Risk:** Potential vandalism of water pan infrastructure requires continuous community supervision and security measures.
- **Water Quality and Health Risks:** Contamination risks from fecal matter and machinery fuel spillage necessitate hygiene education and strict operational protocols.
- **Environmental Impact:** Construction activities could lead to noise pollution, soil compaction, and siltation, impacting local ecosystems and agriculture.
- **Safety Concerns:** Safety hazards such as site accidents and drowning risks for children highlight the need for safety measures and community awareness.
- **Social and Management Issues:** Potential conflicts over water use among neighboring communities and within the water users' association emphasize the importance of effective governance and conflict resolution mechanisms.

6.7 Suggestions and comments from public consultations

- It was suggested that the contractor facilitate awareness sessions for both workers and the community on HIV/AIDS and other communicable diseases, potentially distributing condoms, to mitigate risks associated with the influx of workers.
- Members proposed the formation of a small CLC comprising community elders, youth, and women representatives to meet regularly with the contractor to discuss progress and resolve issues collaboratively.
- The community advised that when selecting local people for jobs, special consideration should be given to vulnerable households, such as those headed by women, persons with disabilities, or the youth.
- The community recommended the installation of clear safety signage, controlled access to the construction site, and community sensitization, particularly to safeguard children and livestock from potential construction-related hazards.
- If applicable in the area, members recommended that the fence design include specific gaps or passages (e.g., raised bottom wires or specific gates) to allow for the safe movement of small to medium-sized wildlife.
- Members advised that a strict zero-tolerance policy for alcohol and drugs on site be enforced, with visible signage and consequences for breach, to prevent accidents and anti-social behavior

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 desilting, construction/ installation, operation and decommissioning phases.

7.2 Positive Environmental and Social Impacts during desilting

7.2.1 Restoration of Water Storage Capacity

Removal of accumulated sediments will significantly increase the volume of water that the pan can store during rainy seasons, improving water availability for livestock and limited domestic uses.

7.2.2 Improved Water Quality

Desilting removes organic matter, debris, and contaminants that may have accumulated over time, improving the quality of stored water and reducing risks of contamination.

7.2.3 Temporary Employment Opportunities

The desilting process may create short-term job opportunities for local community members, particularly in activities such as manual clearing, site preparation, and transportation of materials.

7.2.4 Improved Drainage and Water Flow Efficiency

Removing silt improves the inlet and outlet efficiency of the water pan, allowing rainwater runoff to flow more effectively into the storage area.

7.2.5 Availability of Nutrient-Rich Silt for Agriculture

The excavated silt can be reused as soil conditioner or mixed with compost for tree nurseries or farming activities, supporting improved soil fertility.

7.3 Positive Environmental and Social Impacts during construction

7.3.1 Local Employment Creation

Construction activities will create temporary employment opportunities for skilled and unskilled labor from nearby communities.

7.3.2 Skill Development and Capacity Building

Local workers may gain practical experience and technical skills in construction, masonry, and site management.

7.3.3 Improvement of Local Infrastructure

Construction of livestock troughs, fencing, and sanitation facilities will improve the functionality and sustainability of the water pan.

7.3.4 Stimulation of Local Economy

Local suppliers and businesses may benefit from the demand for construction materials, food, and other services.

7.3.5 Strengthening Community Participation

The project encourages collaboration between the community, local administration, and implementing agencies.

7.3.6 Improved Sanitation Facilities

Construction of latrines will enhance hygiene and sanitation standards around the project area.

7.3.7 Improved Livestock Watering Systems

Livestock troughs will reduce direct access of animals to the water pan, helping maintain water quality.

7.3.8 Strengthened Institutional Collaboration

The project promotes coordination among county government departments, water management institutions, and local leadership structures.

7.4 Positive Environmental and Social Impacts during operation

7.4.1 Improved Livestock Productivity

Reliable water supply will enhance livestock health and productivity, supporting pastoral livelihoods.

7.4.2 Increased Household Income

Higher livestock productivity and improved agricultural activities may lead to increased household earnings.

7.4.3 Enhanced Food Security

Availability of water supports livestock and limited crop production, improving access to food.

7.4.4 Improved Drought Resilience

The water pan will act as a critical water reserve during dry seasons and drought periods.

7.4.5 Livelihood Diversification Opportunities

Water availability may enable new activities such as beekeeping, poultry keeping, and small-scale irrigation.

7.4.6 Improved Public Hygiene and Sanitation

The presence of sanitation facilities and managed water access reduces contamination risks.

7.4.7 Groundwater Recharge

Stored water may gradually infiltrate the soil, contributing to local groundwater replenishment.

7.4.8 Flood Control and Runoff Management

The water pan will capture excess runoff during rainy seasons, reducing downstream flooding and soil erosion.

7.5 Positive Environmental and Social Impacts during decommissioning

7.5.1 Temporary Employment Opportunities

Decommissioning activities such as dismantling structures and land restoration may provide short-term employment for local workers.

7.5.2 Land Restoration and Rehabilitation

The area occupied by the water pan can be restored and potentially repurposed for other productive uses such as agriculture or grazing.

7.5.3 Reduced Safety Risks

Removal of aging or structurally compromised infrastructure reduces the risk of accidents or structural failure.

7.5.4 Recovery and Reuse of Materials

Some construction materials may be salvaged and reused in other community infrastructure projects.

7.5.5 Environmental Recovery

Proper site rehabilitation may allow natural vegetation and ecosystems to regenerate over time.

7.6 Negative Environmental Impacts and Mitigation during the Desilting Phase

7.6.1 Water Turbidity and Sediment Release

Desilting will disturb accumulated silt and sediments, causing temporary water turbidity. This may affect water quality for livestock and community use. High sediment loads may also impact downstream aquatic life.

The proposed mitigation measures will include:

- Schedule desilting during low rainfall periods to reduce runoff.
- Use temporary silt barriers at inlet and outlet points.
- Dispose of removed silt at designated locations away from watercourses.

7.6.2 Disturbance of Aquatic Life

Removing silt and vegetation may temporarily destroy habitats of mudfish and other aquatic organisms. Waterfowl and fish breeding areas may be disrupted

Mitigation measures

- Relocate aquatic life where feasible prior to desilting.
- Limit disturbance to demarcated areas only.
- Avoid desilting during breeding seasons if possible

7.6.3 Soil erosion

Excavation and machinery movement may loosen soil around the pan. Rainfall can wash this soil into the pan or surrounding areas, degrading soil quality.

Mitigation measure

- Maintain vegetation buffers where possible.
- Restrict heavy machinery to designated routes.
- Stabilize exposed soil with temporary cover or grassing.

7.6.4 Air Pollution / Dust

Handling dry silt and moving machinery generate dust affecting workers and nearby livestock/crops.

Proposed mitigation and management measures.

- Apply water sprays on exposed soil and stockpiles.
- Provide dust masks to workers.
- Schedule transport during low-wind period

7.6.5 Oil Spills

Machinery fuel handling may contaminate soil or water

Mitigation measures

- Store and handle fuel at designated areas.
- Train staff on safe refueling.
- Maintain machinery to prevent leaks.

7.7 Negative Socio-economic impacts in the desilting phase.

7.7.1 Temporary Disruption of Community Access

Desilting may restrict grazing, footpaths, or communal land use, causing inconvenience

to locals

Mitigation measures

- Inform the community of timelines via barazas and local administration.
- Provide alternative access points.
- Ensure quick completion of works.

7.7.2 Risk to Livestock and Crops

Vehicles and machinery may Water Panage crops or disturb livestock if they stray into work areas

Mitigation measures

- Fence off the work area.
- Provide clear warning signs.
- Restrict machinery movement to designated zones.

7.7.3 Occupational Health and Safety for Workers

Desilting machinery may cause injuries to workers if safety is ignored

Mitigation measures

- Provide PPE and first aid kits.
- Train workers on safe handling.
- Appoint a safety officer on site

7.8 Negative Environmental impacts in the construction phase.

7.8.1 Temporary Disruption of Land Use and Access

The construction of the Nyalilbuch Water Pan will require clearing and use of community land, which may temporarily restrict access to grazing areas, footpaths, or other communal resources. This disruption can affect livestock movement, community daily routines, and may cause frustration if residents are not informed in advance. While temporary, unmanaged disruptions could escalate into local conflicts or complaints. Effective planning and engagement are critical to ensure smooth implementation.

Mitigation Measures:

- Advance sensitization of the community through barazas and local administration to inform about timelines and access restrictions.
- Clear demarcation of the construction zone to avoid interference with unaffected areas.
- Provision of alternative routes or access points for people and livestock.
- Timely execution of construction activities to minimize duration of disruption.
- Community liaison personnel on-site to address concerns.

7.8.2 Disturbance of Vegetation and Biodiversity

Site clearance for construction will result in the removal of vegetation, pasture, and potentially affect local wildlife. The clearing of trees and shrubs may reduce natural habitat, disturb fauna, and cause loss of biodiversity in the surrounding area. Without controlled

clearing, this could lead to long-term ecological impacts. Maintaining selective vegetation removal is essential to minimize ecological losses.

Mitigation Measures:

- Limit site clearance to project-demarcated areas; exercise selective trimming of trees.
- Allow the community to harvest vegetation that is to be cleared prior to works.
- Support establishment of a community tree nursery for indigenous species.
- Implement compensatory planting of trees after construction.
- Sensitize construction workforce on ecological conservation.

7.8.3 Soil Erosion

Excavation, tramping by machinery, and removal of vegetation can loosen topsoil and increase susceptibility to erosion, especially during rainfall. Sediment can be washed into nearby water channels, reducing water quality and affecting downstream areas. Uncontrolled erosion can compromise the structural integrity of the pan and surrounding land.

Mitigation Measures:

- Avoid construction during wet season.
- Limit excavation to marked boundaries; ensure proper compaction at recommended soil moisture.
- Designate specific vehicle routes.
- Selectively remove mature indigenous trees only when necessary.
- Compensatory planting and workforce sensitization on conservation.

7.8.4 Noise and Vibration Generation

Construction machinery and transport vehicles generate noise and vibrations that can disturb local wildlife and nearby communities. Prolonged exposure to high noise levels may affect workers' hearing and contribute to temporary discomfort for residents. While medium-risk due to distance from dwellings, mitigation is necessary to comply with occupational safety standards.

Mitigation Measures:

- Avoid idling of machinery when not in use.
- Restrict noisy activities to daytime only.
- Provide ear protection for workers.
- Ensure machinery and vehicles are well-maintained.

7.8.5 Air Pollution (Emissions and Dust Generation)

Dust from excavation and vehicle movement, as well as emissions from machinery, may reduce air quality temporarily. While the nearest residents are over 3 km away, uncontrolled dust can impact workers' health and nearby flora.

Mitigation Measures:

- Regular maintenance of machinery to reduce emissions.
- Limit unnecessary engine operation; provide dust masks.

- Place haul roads and stockpiles away from sensitive receptors; use water sprays for dust suppression.

7.8.6 Oil Spills

Fuels, oils, and lubricants used by machinery can contaminate soil and surface water, potentially rendering water unsafe for livestock and humans. Accidental spills could occur during refueling or equipment maintenance.

Mitigation Measures:

- Maintain vehicles and machinery to avoid leaks.
- Handle, store, and dispose of oils properly; refuel in designated areas.
- Sensitize site staff on fuel storage and safety procedures.

7.8.7 Solid Waste Generation

Construction generates solid waste from masonry, packaging, and other materials. Improper management can lead to littering, blocked drains, or soil contamination.

Mitigation Measures:

- Segregate waste; dispose non-recyclables per NEMA and county regulations.
- Provide temporary waste receptacles on-site.
- Liaise with licensed waste collectors for routine disposal.

7.8.8 Excavated Material & Desilted Silt

Excavation and desilting produce large volumes of soil and silt that may wash into channels if not managed. Improper disposal can reduce water quality, affect downstream users, and hinder future pan functionality.

Mitigation Measures:

- Dump unused material in designated locations per supervising engineer.
- Use excavated soil for water pan walls/embankments.
- Incorporate silt with compost for potting in tree nursery.

7.9 Negative Socio-economic impacts in the construction phase.

7.9.1 Occupational Health and Safety (OHS)

Construction of the Nyalilbuch Water Pan involves heavy machinery, excavation, and masonry works, which present significant risks to workers. Accidents such as falls into excavations, injuries from moving equipment, and mishandling of tools or materials could occur. Without proper safety measures, workers may suffer serious injuries or fatalities. Ensuring strict adherence to occupational health and safety standards is essential to prevent such incidents.

Mitigation Measures:

- Fence off the site and display clear warning signs to prevent unauthorized access.
- Provide all workers with full PPEs and training on proper usage.
- Train workers on first aid and maintain a fully equipped First Aid Kit on site.
- Maintain an Incident and Accident Register for recording injuries.

- Prepare an emergency management plan with contacts for police, ambulance, etc.
- Appoint a qualified health and safety officer to manage OHS issues.
- Store tools and equipment safely when not in use.

7.9.2 Risk of Accidents to the Community

Movement of construction vehicles and machinery may pose risks to community members, particularly children, and livestock. Hauling materials along local paths may lead to collisions or other accidents if proper safety precautions are not enforced. Without awareness and safeguards, these risks could escalate during peak construction activities.

Mitigation Measures:

- Sensitize the community about the project and necessary caution measures.
- Restrict access to the construction site except for essential personnel.
- Employ qualified drivers and instruct them to follow speed limits.
- Install warning signboards at the construction site and risk areas.

7.9.3 Increased Exposure to Transmissible Diseases, including HIV/AIDS

The influx of workers during construction may introduce risks of sexually transmitted infections and communicable diseases. Temporary camps can disrupt local social dynamics, increasing exposure to high-risk behaviors. Without health education and access to prevention services, the incidence of disease could rise in the community.

Mitigation Measures:

- Sensitize workers and community members on HIV/AIDS and other communicable diseases.
- Enforce Contractor's Health and Safety Management Plan (CHSMP) via DOSH.
- Control access to workforce camps to minimize outside contact.
- Provide quality condoms at the construction site.

7.9.4 Labour Risks including Labour Influx

Using both local and external labor can bring economic opportunities but may also lead to social tension, insecurity, or illicit behavior. Conflicts may arise over resources or perceived favoritism, and crime, substance abuse, or commercial sex work could increase. Proper labor management and engagement with the community are crucial to mitigate these risks.

Mitigation Measures:

- Ensure compliance with Kenya's labour laws and AfDB Operational Safeguard 5 in the contract.
- Sensitize all workers on the AfDB Code of Conduct, national labour standards, and community engagement.
- Prioritize local community members for casual and unskilled labor opportunities.
- Conduct pre-employment orientation and continuous awareness training.
- Maintain a detailed worker registry on-site for traceability.
- Train the Project Management Committee (PMC), Site Advisory Implementation Committee (SAIC), and County Environmental and Social Safeguards Officers (CESSCOs) on labor monitoring.

7.9.5 Risk of Social Conflict

Conflicts can occur between workers and community members due to cultural differences, competition for resources, or pre-existing community tensions. Mismanagement of these issues may escalate into prolonged disputes, affecting project implementation and community cohesion.

Mitigation Measures:

- Incorporate AfDB and national labour codes into the Procurement and Contract Agreement.
- Sensitize workers on Code of Conduct.
- Develop and implement local hiring rules in partnership with the community.
- Train workers and project committees on conflict management and resolution.

7.9.6 Child Labor and School Dropout

The presence of construction activities and an influx of workers may increase opportunities for children to engage in labor to support the project economy, leading to school absenteeism or dropouts. Without monitoring, these risks may compromise children's welfare and education.

Mitigation Measures:

- Sensitize the community on national child welfare policies and AfDB child protection standards.
- Ensure contractor compliance with child welfare policies.
- Use Identification Cards to verify worker age and prevent child labor.

7.9.7 Gender-Based Violence (GBV)

GBV risks can arise if gender inclusivity requirements in hiring or project management are not enforced. Women and girls may be disproportionately affected if human rights and labor standards are ignored.

Mitigation Measures:

- Conduct continuous community engagement and consultation, especially with women and girls.
- Review project components to identify GBV risk areas such as hiring and remuneration.
- Develop specific plans to mitigate these risks, including sensitization programs.
- Ensure adequate referral mechanisms are in place for reported GBV cases.

7.9.8 Sexual Exploitation and Abuse (SEA) by Project Workers

SEA occurs when project staff abuse their authority, for example, by promising jobs in exchange for sexual favors. This represents a serious social risk if preventive measures are not enforced.

Mitigation Measures:

- Develop a SEA Action Plan with Accountability and Response Framework.
- Prevent SEA through Code of Conduct and ongoing staff sensitization.
- Provide survivor-centered multi-sectoral referral and assistance.
- Engage the community and implement confidential reporting mechanisms.
- Integrate SEA prevention measures into job descriptions, contracts, and performance evaluations.

7.10 Negative Environmental impacts in the operation phase.

7.10.1 Surface and Groundwater Pollution

During operation, the water pan may be exposed to contamination from livestock, agrochemicals, or poor farming practices upstream. Uncontrolled pollution could make water unsafe for livestock or domestic use, affecting community health and livelihoods. Oil residues from prior construction activities could also leach into the water if not properly managed. Continuous monitoring and controlled access are essential to maintain water quality.

Mitigation Measures:

- Fence the water pan and have only one controlled entrance.
- Ensure water is drawn from designated sites only.
- Clear all solid wastes and construction debris after works.
- Construct pit latrines at a safe distance from the water source.
- Develop and implement an Integrated Pest Management Plan (IPMP) with community sensitization.
- Conduct regular water quality monitoring.

7.10.2 Soil Erosion and Siltation

Concentration of livestock at watering points and poor farming practices upstream may cause soil erosion. Erosion increases sedimentation in the water pan, reducing storage capacity, water quality, and pan lifespan. Overstocking of livestock could exacerbate land degradation and silt accumulation.

Mitigation Measures:

- Construct silt traps/check Water Pans along the inlet water course.
- Ensure regular maintenance of silt traps by the community.
- Plant embankments with suitable grasses as per the design plan.
- Implement the Integrated Sustainable Land Management (ISLM) Plan.
- Sensitize the community on soil conservation and appropriate livestock stocking rates.
- Undertake periodic desilting manually during dry seasons.
- Consider piping water to reduce livestock concentration in sensitive areas.

7.10.3 Water Pan Wall Failure and Associated Risks

Excessive rains or lack of maintenance could cause the water pan walls to fail, releasing large volumes of water downstream. This could Water Panage property, erode land, and pose serious risks to people and animals. Routine inspections and preventive measures are essential to minimize risk.

Mitigation Measures:

- Develop a Nyalilbuch Water Pan Crisis Action Plan (CAP).
- Conduct annual inspections by a qualified water resources professional.
- Monitor the pan before and after each rainy season.
- Conduct in-depth inspections every 3–5 years.
- Train project management committees and local teams on early risk detection.
- Maintain an Emergency Action Plan (EAP) for preventive maintenance.
- Undertake annual environmental audits per NEMA requirements.

7.10.4 Solid Waste Generation

During operation, waste may accumulate from farming and livestock activities, including agrochemical containers and household litter. Improper disposal could introduce toxins into the environment, harming both humans and livestock.

Mitigation Measures:

- Sensitize the community on proper disposal of agrochemical containers and other waste.
- Sort and segregate waste before disposal.
- Provide litter/waste bins at the site for temporary storage.
- Use NEMA-registered waste collectors for transport and disposal.

7.10.5 Risk of Drowning

The water pan presents a drowning risk to humans or animals if the perimeter fence is Water Damaged or the gate left open. This risk is significant for children and livestock without supervision.

Mitigation Measures:

- Install and maintain secure fencing with a locked gate.
- Sensitize the community on the risks of drowning.
- Encourage community involvement in maintaining the perimeter fence.
- Employ a guard through the Water Users' Association (WUA) for monitoring.

7.10.6 Impacts on River Regime and Downstream Users

The water pan collects runoff from ephemeral channels, which flow only during rainy periods. Properly managed, the pan will not adversely affect downstream water availability, as it harvests otherwise lost floodwater.

Mitigation Measures:

- Ensure the pan is operated per design to avoid disrupting downstream flow.
- Monitor water extraction and maintain balance between upstream and downstream needs.

7.11 Negative Socio-economic impacts in the operation phase.

7.11.1 Outbreak of Livestock Diseases

The concentration of animals at the water pan may increase the risk of pest and disease transmission among livestock. Without preventive measures, this can reduce livestock productivity and income for farmers. Disease outbreaks can also affect local food security.

Mitigation Measures:

- Conduct regular veterinary disease surveillance.
- Sensitize the community on disease monitoring and control.
- Implement a livestock disease management plan.

7.11.2 Human Health Impacts (Malaria, Schistosomiasis, Waterborne Diseases)

Standing water in the pan can become a breeding ground for disease vectors, particularly mosquitoes causing malaria, or schistosomes. Communities may also attempt to use untreated water for drinking. Such risks can increase disease prevalence and burden.

Mitigation Measures:

- Sensitize the community on malaria prevention (nets, indoor residual spraying, bush clearing).
- Maintain a malaria surveillance program.
- Establish a community health education committee coordinated through public health departments.
- Train the community on water purification methods.

7.11.3 Occupational Health and Safety Concerns

During operational use of water for farming, improper handling of fertilizers or chemicals may pose risks to workers and users. Exposure without proper knowledge could lead to poisoning, injury, or environmental contamination.

Mitigation Measures:

- Implement Integrated Pesticide Management Plan (IPMP).
- Train farmers on safe agrochemical application and residue management.
- Monitor agricultural chemical use through the field program.
- Promote organic manure use where possible.

7.11.4 Water Use-Related Conflicts

Limited rainfall, increased irrigation demand, and dependency on the pan may create conflicts among households, farmers, and livestock owners. Competition over water resources could escalate without regulation and community engagement.

Mitigation Measures:

- Develop a community water users' development plan with local WRUAs.
- Formulate local by-laws to guide water use.
- Sensitize the community on efficient water use.
- Raise awareness on project benefits to promote cooperation.

7.11.5 Poor Leadership and Management Problems

Mismanagement of the water pan can reduce benefits to the community, including water supply, crop irrigation, and livestock watering. Lack of transparency can reduce trust and participation in project activities.

Mitigation Measures:

- Train the Project Management Committee (PMC) on water project and financial management.
- Sensitize the community on project oversight and accountability

7.11.6 Child Labor and School Dropout

Irrigation activities may create economic opportunities that attract children to work instead of attending school. This may increase social vulnerabilities and reduce long-term human capital.

Mitigation Measures:

- Train village volunteer child monitors with the office of the chief and children's department.
- Sensitize the community on child protection issues related to the project.

7.12 *Negative Environmental impacts in the decommissioning phase.*

7.12.1 *Reduction in Land Productivity*

When the water pan is decommissioned, the land previously irrigated and supported by the water pan will lose its water supply. This may result in reduced crop yields and decreased soil moisture, affecting both agricultural output and land fertility. Without intervention, the previously productive land could become degraded and underutilized.

Mitigation Measures:

- Conduct an environmental and social impact assessment before decommissioning.
- Restore the land to its original state if the water pan is to be abandoned.
- Promote soil conservation measures such as tree planting or cover cropping after decommissioning.

7.12.2 *Increased Soil Erosion and Land Degradation*

Decommissioning can expose embankments, excavated areas, and catchment slopes, increasing runoff and the risk of soil erosion. Lack of water regulation can accelerate land degradation downstream. These effects may impact local ecosystems and reduce the resilience of the land to future climatic events.

Mitigation Measures:

- Stabilize embankments and slopes through grass planting or other bioengineering methods.
- Implement soil conservation measures such as terracing or minimal tillage.
- Monitor the site for erosion and take corrective measures if degradation occurs.

7.12.3 *Loss of Aquatic and Terrestrial Habitat*

The removal or abandonment of the water pan will destroy a habitat that supported fish, wild ducks, and other aquatic or semi-aquatic species. Local biodiversity may be negatively affected, particularly species that relied on the pan for breeding, feeding, or shelter. This could reduce ecological services such as natural pest control and local biodiversity value.

Mitigation Measures:

- Conduct habitat restoration activities, including replanting native vegetation.
- If possible, relocate fish or create alternative habitats upstream.
- Engage the community in biodiversity conservation initiatives post-decommissioning.

7.13 *Decommissioning Phase – Socio-Economic Impacts*

7.13.1 *Loss of Livelihoods and Household Income*

Communities relying on the water pan for irrigation, livestock watering, or other income-generating activities may face reduced productivity. Loss of water access may force households to spend more time fetching water or grazing livestock, lowering overall economic output. This can exacerbate poverty and reduce resilience to drought.

Mitigation Measures:

- Explore alternative water sources for the community before decommissioning.
- Implement livelihood restoration programs to offset losses.
- Engage community members in planning to transition economic activities.

7.13.2 Reduction in Employment Opportunities

Workers previously employed in operation, maintenance, or auxiliary activities may lose jobs. Local employment generated by water-based agriculture, livestock, or community services may decrease. Without planning, this could lead to increased unemployment and reduced social stability.

Mitigation Measures:

- Provide skills training for alternative livelihoods.
- Offer temporary employment in site restoration or land rehabilitation.
- Encourage community participation in restoration projects to maintain some employment.

7.13.3 Water Scarcity and Increased Burden on Women

Decommissioning the water pan reduces access to water for domestic use, livestock, and irrigation. Women, often responsible for water collection, may face increased time and physical burdens, affecting household productivity and education for children. Scarcity may also drive water-related conflicts in the community.

Mitigation Measures:

- Ensure alternative water sources are available prior to decommissioning.
- Engage the community in water management planning.
- Implement equitable water distribution mechanisms for remaining resources.

7.13.4 Increased Risk of Waterborne Diseases

Without the managed water pan, communities may rely on unsafe natural water sources. This increases exposure to waterborne diseases such as diarrhoea, typhoid, or schistosomiasis, particularly in a semi-arid area like Nyalilbuch.

Mitigation Measures:

- Promote water treatment and hygiene awareness campaigns.
- Construct alternative safe water points if possible.
- Encourage community monitoring of water quality and sanitation practices.

7.13.5 Reduced Community Resilience to Climate Change

The absence of the water pan decreases community ability to cope with drought or erratic rainfall, limiting adaptive capacity. Livelihoods, food security, and income may be more vulnerable to climate shocks.

Mitigation Measures:

- Implement integrated land and water management plans post-decommissioning.
- Explore rainwater harvesting or small-scale water storage alternatives.
- Train the community on sustainable adaptation practices.

8 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

8.1 Introduction

The project proponent recognizes that the implementation of the proposed activities will result in certain impacts on the biophysical environment, as well as on the health, safety, and socio-economic conditions of the Nyalilbuch community and other local stakeholders. Accordingly, the primary objective will be to minimize adverse effects while enhancing the project's positive contributions. To support this, an Environmental and Social Management and Monitoring Plan (ESM&MP) has been prepared to guide the mitigation and management of environmental and social impacts throughout the project's life cycle. It is important to note that project conditions and influencing factors may evolve over time; therefore, the ESM&MP has been designed to allow flexibility and adaptability. Regular reviews and updates are recommended to ensure its continued relevance and effectiveness.

Tables 8-1 form the core of this ESM&MP for the desilting construction, operational and decommissioning phases of the proposed desilting and construction of Nyalilbuch Water Pan. 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 Plan

Environment/ Social Impact	Proposed Mitigation Measure	Indicator	Responsibility	Means of Verification	Time Frame	Estimated cost (Kshs)
NEGATIVE ENVIRONMENTAL IMPACTS IN THE DESILTING PHASE						
Increased turbidity and sediment discharge during desilting	<p>Install geotextile silt curtains around active excavation zones to contain suspended solids within the work area.</p> <p>Construct temporary downstream earth bunds ($\geq 0.5\text{m}$ height) to slow runoff velocity and allow sediment settlement before discharge.</p> <p>Adopt sectional desilting (max 30% surface area at a time) to prevent complete disturbance of the water body.</p> <p>Immediately compact and stabilize exposed banks after excavation using manual compaction and light roller to reduce loose sediment mobility.</p> <p>Create temporary sedimentation sump pits to trap fine particles before water re-enters the pan.</p>	<p>Turbidity levels within acceptable range</p> <p>No visible sediment plume $>10\text{m}$ downstream</p> <p>No siltation complaints from downstream users</p>	Contractor / Environmental Officer	Water quality tests; inspection reports; photo documentation	Throughout desilting	300,000
NEGATIVE SOCIO-ECONOMIC IMPACTS IN THE DESILTING PHASE						
Temporary interruption of community access to water	<p>Install 5,000–10,000L temporary plastic storage tanks at accessible locations within 200m of settlement clusters.</p> <p>Arrange controlled water trucking (if needed) during peak construction days.</p> <p>Provide 14-day prior written and verbal notice through barazas and posters.</p> <p>Create temporary safe access ramp to a partially retained water section.</p> <p>Establish temporary water access committee to oversee fair distribution during works.</p> <p>Prioritize rapid desilting schedule at least every month to reduce disruption period.</p>	<p>Continuous minimum water supply is maintained</p> <p>Less than 3 recorded access complaints</p> <p>Public notice evidence available</p>	Proponent / Contractor	Meeting minutes; grievance log; photo records	Throughout desilting	50,000

Environment/ Social Impact	Proposed Mitigation Measure	Indicator	Responsibility	Means of Verification	Time Frame	Estimated cost (Kshs)
NEGATIVE ENVIRONMENTAL IMPACTS IN THE CONSTRUCTION PHASE						
Vegetation clearance & habitat loss	Demarcate construction footprint Restrict clearing beyond marked zone Replant indigenous trees (3:1 ratio) Transplant salvageable shrubs Monitor tree survival quarterly Protect buffer vegetation strip	Tree survival of up to 75% or more No clearing outside boundary Buffer vegetation intact	Contractor / Proponent	Vegetation monitoring report	During & after	150,000
Fuel, oil & chemical contamination	Designated refueling area 50m from water body Concrete refueling pad with oil trap Spill kits at all machinery points Staff training on spill response Prohibit servicing near water body Maintain spill incident reporting	Zero major spills Spill kits present & stocked Spill log maintained	Contractor	Spill register; inspection checklist	Continuous	40,0000
Wastewater discharge (cement wash, sanitary wastewater)	Provide portable toilets (1 per 20 workers) Engage licensed desludging service Temporary lined pit for cement wash water Neutralize cement wash water before disposal Handwashing stations with soap Sanitation inspection checklist	No wastewater discharged into pan Desludging receipts available Clean toilets; no odor complaints	Contractor	Inspection reports/cleaning records	During construction	30,000
Dust emissions from site works	Water spraying twice daily Cover haul trucks Stabilize temporary stockpiles Restrict works during high wind Limit vehicle speed to reduce dust from raising	Reduced visible dust Little to no complaints Speed compliance logs	Contractor	Community complaint log; inspection	Throughout construction	15,000

Embankment erosion & slope instability	Compact fill in 300mm layers $\geq 95\%$ Proctor density Maintain slope $\leq 1:2$ Stone pitching on high-stress zones Diversion drains upslope Hydro-seed embankments within 7 days Install biodegradable erosion mats	No gully formation vegetation covers in 2 months of at least 70% Stable slope after rainfall	Contractor / Engineer	Inspection reports; vegetation monitoring	During & post-construction	100,000
Toilet seepage & groundwater contamination	Septic tanks lined with reinforced concrete Site toilets 30m from pan Soak pits designed based on soil test Install vent pipes Periodic inspection Seal joints watertight	No seepage Acceptable water quality Odor controlled	Contractor / Engineer	Engineering inspection; water tests	During & post construction	20,000
Surface water alteration & drainage blockage	Maintain natural flow paths Install culverts at access roads Grade site to prevent pooling Inspect after rainfall Avoid debris blockage	No localized flooding Drainage channels clear No stagnant water	Contractor	Inspection reports	Throughout construction	70,000
Noise pollution	Restrict works to 8am–5pm Maintain machinery Inform community of noisy operations Avoid simultaneous heavy equipment Provide ear protection	Noise is at acceptable limits Little to no complaints Work schedule compliance	Contractor	Complaint register; site inspection	During works	5000
Water usage inefficiency	Develop daily water usage plan Abstract water only during approved hours Use water-efficient equipment Reuse treated wastewater for dust suppression Monitor daily consumption	Daily abstraction log No visible water wastage Water use within limits	Contractor / Proponent	Water usage records; inspection	Throughout construction	3,000

	Prevent leaks/ quick repairs in case of leaks					
Increased traffic accidents	Enforce a speed limit Install warning signage Use trained drivers Avoid night transport Community awareness campaign	Zero accidents Speed logs maintained Signs installed	Contractor	traffic monitoring log	During construction	30,000

Environment/ Social Impact	Proposed Mitigation Measure	Indicator	Responsibility	Means of Verification	Time Frame	Estimated cost (Kshs)
NEGATIVE SOCIO-ECONOMIC IMPACTS IN THE CONSTRUCTION PHASE						
Occupational Health & Safety (OHS) risks	Site-specific OHS plan Daily toolbox talks Mandatory PPE Temporary fencing around excavation Safety officer on-site First aid kit & trained personnel Certified machinery operators Display emergency contacts Zero alcohol/drug policy	Zero fatalities PPE compliance incident register maintained	Contractor / Safety Officer	Safety audit; PPE checklist; incident log	Throughout construction	100,00
Conflict over fencing & access	Public consultation forums Agree gate placement Separate pedestrian & livestock gates Develop by-laws Grievance mechanism Display access rules	Signed consultation records resolved grievances Functional gates installed	Proponent / Local Admin	Meeting records; grievance log	Before & during	30,000

Temporary disruption of livestock watering	Schedule works outside peak hours Provide temporary troughs Community coordination meetings Rapid completion schedule Maintain livestock corridor	Watering schedule adhered Less than 2 complaints Continuous livestock access maintained	Proponent	Community meeting minutes	During works	50,000
Disruption of community traffic & access	Schedule material deliveries off-peak Warning signs Use trained drivers Enforce speed limits Community awareness	No accidents Traffic flow maintained Little to no complaints (Less than 2)	Contractor	Traffic monitoring log; complaint register	During works	20,000
Noise & nuisance to residents	Schedule material deliveries off-peak Warning signs Use trained drivers Enforce speed limits Community awareness	No accident Traffic flow maintained	Contractor	Traffic monitoring log; complaint register	During works	30,000
Labor influx tensions & GBV risk	≥70% local hiring Worker code of conduct GBV awareness training Separate worker accommodation Zero tolerance disciplinary policy Collaborate with local leaders	Signed conduct forms No GBV complaints Majority local workforce	Contractor	HR records; grievance log	During works	15,000

Environment/ Social Impact	Proposed Mitigation Measure	Indicator	Responsibility	Means of Verification	Time Frame	Estimated cost (Kshs)
NEGATIVE ENVIRONMENTAL IMPACTS IN THE OPERATIONAL PHASE						
Eutrophication & algal blooms	Control nutrient inflow via vegetative buffer strips Remove accumulated organic debris monthly Prevent fertilizer runoff from nearby farms Community awareness on waste disposal Periodic desludging plan	Absence of visible algal bloom Vegetative buffer intact Nutrient levels controlled	Proponent / Committee	Monitoring report; photos	Continuously	45,000
Soil erosion around troughs & access paths	Gravel high-traffic areas Construct drainage channels Routine compaction of pathways Grass re-seeding Install erosion control stones	No gully formation Stabilized livestock routes Vegetation cover up to 80%	Proponent	Inspection checklist	Bi-annually	60,000
Water quality deterioration (livestock waste, runoff)	Designate separate livestock & human access points Construct raised troughs away from pan edge Install silt traps at inlets Routine water testing (quarterly) Prohibit direct livestock entry Community water-use by-laws enforcement	Water test results within standards No livestock entering pan Reduced turbidity levels	Water Users Committee	Lab reports; site inspections	Quarterly	30,000
Groundwater contamination from toilets	Regular septic tank inspection Desludge every 6–12 months Monitor nearby borehole/well quality Maintain watertight seals Immediate repair of cracks	Desludging records Water quality compliant No odor complaints	Proponent / Public Health Officer	Service receipts; lab tests	Annual	70,000

Solid waste accumulation (plastics, litter)	Install labeled waste bins Weekly waste collection Partner with licensed waste handler Display anti-litter signage Community cleanup days	Clean surroundings Waste collection log Reduced litter presence	Water Committee	Waste disposal receipts	Weekly	10,000
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Environment/ Social Impact	Proposed Mitigation Measure	Indicator	Responsibility	Means of Verification	Time Frame	Estimated cost (Kshs)
NEGATIVE SOCIO-ECONOMIC IMPACTS IN THE OPERATIONAL PHASE						
Vandalism & theft of infrastructure	Employ a caretaker/security Community ownership sensitization Install lockable gates Proper lighting (solar) Report vandalism promptly	Reduced vandalism incidents Functional fencing Security attendance log	Proponent	Incident reports	Continuously	50,000
Public health risks (waterborne diseases)	Promote boiling/treatment for domestic use Hygiene awareness campaigns Regular water testing Maintain clean trough separation Handwashing facilities at toilets	Reduced illness reports Hygiene campaign attendance Water tests compliant	Public Health Officer	Health records; reports	Bi-annual	100,000
Gender inequity in water access	Ensure women represented in committee Design separate sanitation facilities Schedule equitable watering times Conduct gender inclusion training Monitor participation levels	Have at least a third women in committee Equal access observed Gender complaints reduced	Water Committee	Committee records	Annual	40,000
Livestock congestion & injury risk	Stagger watering times Provide multiple trough points Maintain clear livestock corridors Repair Water Damaged fencing Train herders on safe watering	Reduced livestock injuries Smooth watering flow No congestion observed	Committee	Inspection log	Continuous	75,000

Economic inequality from restricted access	Community consultation before restrictions Subsidized access for vulnerable groups Transparent financial reporting Alternative watering points during drought Regular review of tariff structure	Transparent financial reports No exclusion complaints Stakeholder satisfaction	Proponent	Financial statements	Annual	55,000
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Environment/ Social Impact	Proposed Mitigation Measure	Indicator	Responsibility	Means of Verification	Time Frame	Estimated cost (Kshs)
NEGATIVE ENVIRONMENTAL IMPACTS IN DECOMMISSIONING PHASE						
Land degradation after removal of structures	Backfill excavations Re-contour land to natural slope Compact soil layers Plant indigenous vegetation Install erosion control measures	Land stabilized Vegetation survival 90% No erosion gullies	Contractor / Proponent	Site inspection report	Post-decommission	200,000
Waste generation (demolition debris)	Segregate recyclable materials Engage licensed waste transporter Reuse metal/wood where possible Avoid open burning Maintain disposal records	Disposal receipts available No illegal dumping Clean site post-removal	Contractor	Waste transfer notes	During works	120,000
oil contamination from septic removal	Pump out septic tanks safely Use licensed sludge handler Test soil post-removal Line temporary sludge holding area Decontaminate affected soil	Sludge disposal receipts Soil tests compliant No foul odor	Contractor / Public Health	Lab tests; inspection	During	150,000
Habitat disturbance	Schedule works outside breeding seasons Replant native species Avoid clearing buffer zones Restore natural drainage Monitor biodiversity recovery	Vegetation regrowth Wildlife return observed Drainage restored	Proponent	Environmental monitoring report	Post-removal	100,000

Alteration of drainage patterns	Reconstruct natural flow paths Install temporary diversion drains Prevent blockage with debris Inspect during rainy season Stabilize slopes	No flooding observed Drainage functional Stable slopes	Contractor	Inspection records	During & after	80,000
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Environment/ Social Impact	Proposed Mitigation Measure	Indicator	Responsibility	Means of Verification	Time Frame	Estimated cost (Kshs)
NEGATIVE ENVIRONMENTAL IMPACTS IN DECOMMISSIONING PHASE						
Public safety hazards from abandoned structures	Fence off demolition area Install warning signs Backfill pits immediately Conduct final safety audit	No injuries reported Site cleared Safety audit report	Contractor	Safety inspection report	During	90,000
Social dissatisfaction & mistrust	Transparent financial disclosure Clear closure rationale Complete documentation Engage elders & leaders Keep open grievance channel	Community acceptance Signed consultation records Minimal disputes	Proponent	Consultation minutes	Before & during	60,000
Loss of income for caretakers/vendors	Provide notice period Offer alternative employment support Provide recommendation letters Link affected persons to other projects Compensation where applicable	Affected persons documented Compensation records Reduced grievances	Proponent	Payment records	Pre-closure	150,000
Loss of water source for community	Provide alternative water supply plan Coordinate with county authorities Inform community in advance Phase closure gradually	Alternative source operational Community informed No acute shortages	Proponent / County Gov't	Meeting minutes; inspection	Before closure	300,000
TOTAL						1,263,000

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 Environmental and Social Monitoring Programme

8.2.1 Monitoring and Management

The project will establish both compliance and effects monitoring plans. The compliance monitoring mechanisms will ensure that the various project organizations are implementing the provisions of the ESMMP effectively and on time. The effects monitoring mechanisms will check on the impacts which the project is having on the physical, biological and social environment, by regular measuring of indicators. The results will be fed back to project management for evaluation.

During the project preparatory stages, the proponent, Nyalilbuch Water pan PMC and the CPCU would ensure that the measures outlined in the ESMMP are complied with. When the construction phase commences, it is expected that a supervising consultant (Engineer) be appointed to ensure compliance of the construction contractor. The project Management Unit through the CESSCO and the Monitoring & Evaluation Officer (MEO) will prepare periodic project compliance reports to the BREFONS CPCU & NPCU and other relevant stakeholders.

8.2.2 Compliance Monitoring -Pre-construction and Construction phase

During the project preparatory stages, the proponent and the CPCU would ensure that the measures outlined in the ESMMP are complied with. When the construction phase commences, it is expected that a supervising consultant (Engineer) be appointed to ensure compliance of the construction contractor.

The project Management Unit will prepare periodic project compliance reports

8.2.3 Compliance Monitoring - Operation Phase Monitoring

Periodic preparation of Project Compliance reports will be prepared by the proponent and the SEA, through review of reports and regular site inspections will ensure that the project is implemented in compliance with the ESMP.

The financing partner will mount periodic supervision missions.

8.2.4 Effects Monitoring

Environmental effects monitoring is done to determine the environmental impacts that arise as a result of implementation of the project. In each aspect of the environment, indicators are determined and compliance is measured against those indicators. Main monitoring indicators are as shown in table 12 below.

Table 8:2: Monitoring Indicators

Area	Activity	Indicators	Monitoring Frequency
Surface & Ground Water	Sampling and analysis of water quality in the channels & project area	Turbidity	Quarterly
		pH	Quarterly
		Total dissolved Solids	Quarterly
		Total Suspended Solids	Quarterly
		Nitrates	Quarterly
		Sulphates	Quarterly
		Phosphates	Quarterly
		Chemical Oxygen Demand	Quarterly
		Metals	6-monthly
	Water usage data to be tracked to ensure sustainable water use	Volume of Water use (rate of water uptake).	Weekly
Socio-Economic	Gender Human impact monitoring and rights (GBV/SEA), Child labour	Number of women and disadvantaged groups with income. NO. of GBV/SEA incidences reported and addressed NO. of children involved in child labour reported	Annually
	Public health: Determination of disease prevalence in project area health institutions.	Number of cases in each health facility.	Annually
	Social interactions	Number of project related conflicts	Annually
Ecology	Audit on alien species invasion (AIS) control	Extent of alien species invasion (ha coverage)	Every 2 years

8.2.5 Audits and Reviews

Annual environmental and social audits and reviews will be conducted to assess the performance on environmental, health and safety guidelines and to monitor progress in implementation of the ESMMP. This follows the Environmental (Impact Assessment and Audit) Regulations, 2003 which requires an environmental audit to be conducted annually to determine unforeseen environmental and social issues which can then be incorporated in the ESMMP. The quarterly monitoring reports on ESMMP implementation will form the basis for effective auditing and review of the ESMMP of the proposed sub project.

8.3 Water Pan Crisis Action Plan (CAP)

A crisis action plan for Nyalilbuch Water pan should be developed and would consist of:

- Contact names and telephone numbers (owner of the pan, authorities downstream, police and emergency services and others) to call if the pan is Water Damaged, develops problems or is considered unstable.
- Information on possible areas likely to be affected downstream (estimated area of inundation) should the pan 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 pan 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/ pan failure. Immediate evacuation should take priority over any other action should the stability of the water pan 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.

8.3.1 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 XIII).

8.3.2 Community Training

As the water pan will be owned by the community at least two members of the water pan committee should receive basic training in operation and maintenance aspects of the water pan. 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 (water pan committee) and the responsible organization or administration at county level.

8.4 Risk Assessment

Water pans are considered to be a hazard as it may cause inundation, physical and environmental Water 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 water pan is a low to medium risk hence a crisis action plan is very necessary.

Table 8.3: Class of Water Structures

Class of water structure/Water Pan/water pan	Maximum Depth of Water at NWL (m)	Impoundment and NWL (m3)	Catchment Area (km ²)
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 Water Pans, Pans and Other Water Conservation Structures in Kenya)

Based on the above criterion, Nyalilbuch 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.

8.5 Water Pan Inspection

To ensure the safety of Nyalilbuch water pan 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 pan 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 XI 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 XI).

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 *Conclusion*

The Nyalilbuch Water Pan project has raised issues of importance to the environment, social, health and also economic wellbeing through and an in-depth assessment and evaluation of the environmental and social impacts. Additionally, mitigation measures have been proposed for adverse environmental and social impacts identified as detailed in the ESMMP. Subject to full resourcing and effective implementation of the measures identified in the ESIA CPR, & the ESMMP, the project is considered to be in compliance with the AfDB environmental and social policy guidelines, EMCA Act 1999 and other legislations, policy and regulatory framework. It therefore concluded that the positive impact outweighs the negative impacts raised and the project should be allowed to proceed.

9.2 *Recommendations*

9.2.1 *Implementation*

- ✓ It is recommended to construct a concrete or steel weir at Nyalilbuch Water Pan to stabilize the embankment and safely retain water from high-speed seasonal flows. While the weir helps control water, it cannot fully trap sediments, so complementary measures such as periodic desilting, upstream slope stabilization, vegetative buffers, and mini-settling areas are necessary to reduce silt inflow and ensure long-term pan functionality.
- ✓ It is recommended that the proposed project proponent be allowed to go ahead provided the outlined mitigation measures are implemented as outlined in the ESMMP. The ESMMP will be shared with the Contractor who will implement the Contractor-Specific Environmental and Social Management and monitoring Plan (C-ESMMP).
- ✓ On approval, it is recommended that the proponent should implement the proposed project based on the proposed plans and if alterations are necessary, advice should be sought from the CESSCO and subsequently environmental expert.
- ✓ 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 ESM&MP should be followed fully by the contractor with the supervision from the proponent. A report on the findings from the monitoring of the ESM&MP right from implementation all through to decommissioning phase submitted quarterly.
- ✓ The mitigation measures proposed should be followed by the proponent as it is highlighted in this ESIA report.
- ✓ The design, construction and operation should be carried out in accordance to the specific report for the proposed project.
- ✓ The proponent to undertake Environmental Impact Assessment Studies for all

the proposed borrow pits and areas of construction materials

- ✓ An Environmental Audit be undertaken and submitted to NEMA every year after commissioning of the project to ensure that all the proposed mitigation measures have been complied with. The social impacts raised during community participation should be followed.

In conclusion, the positive impact outweighs the negative impacts raised. Mitigation measures for the negative impacts have been given and, in the end, it is economically viable and therefore it should be allowed to proceed.

9.2.2 Compliance with the Water Quality Regulations

The proponent will comply with the standards set out in the Fourth Schedule of Water Act 2016 by applying for the WRA water permit.

9.2.3 Water Pan Crisis Action Plan and Emergency Response Plan (ERP)

The established water pan CAP should be adhered to by the proponent. The proponent should ensure regular monitoring of the water pan particularly the water pan walls, before and after the rains. The PMC should be trained on detecting and responding to any risk situation and be part of the ERP team together with the local administration. The proponent should establish proper channel of information and communication of ER situation including capacity building of the community and members of the water pan committee.

It is thus recommended that on submission of this report NEMA to consider it and give its approval for the proposed work to commence and as according to the guiding regulations on ESIA and Environmental Audits (EA) issue the ESIA license for the project.

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APPENDICES

Appendix i	Minutes of the Public Participation Meeting
Appendix ii	List of the Public Participation Attendance
Appendix iii	Sample of filled Questionnaires
Appendix iv	Land Resolution Form / Consent
Appendix v	NEMA Practicing License (Lead and Associate Expert)
Appendix vi	Photo Gallery
Appendix Vii	Chance Find Procedure
Appendix viii	ESIA Inspection form
Appendix ix	Water Pan Crisis Action Plan (CAP)
Appendix x	Overview of Emergency Action Plan
Appendix xi	Nyalilbuch Water Pan Drawings and Design

Appendix I: Minutes of Public Consultation Meetings



MINUTES OF THE PUBLIC PARTICIPATION FOR THE PROPOSED DESILTING OF NYALILBUCH COMMUNITY WATER AT NYALILBUCH VILLAGE, IN NYALILBUCH LOCATION, TIATY WEST SUB COUNTY, BARINGO COUNTY HELD ON 24th FEBRUARY, 2026.

MEMBERS PRESENT

See Attached:

AGENDA

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

PRELIMINARY

A community member opened the gathering with a prayer at 12:27 PM. Following this, the County Project Coordinator (CPC), Mr. Elphas Rutto, formally convened the session. The assembly took place on the site of the proposed Nyalilbuch water pan in Nyalilbuch Village on February 24th, 2026. Attendance for the ESIA public forum comprised 25 local residents (8 women, 17 men, of which 8 were youth). A translator from the community facilitated communication throughout the proceedings.

MIN. 1 – 24/02/2026: INTRODUCTION & OPENING REMARKS

The ESIA Consultant 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 rehabilitation of the Nyalilbuch water pan. 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 - 24/02/2026: 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 Nyalilbuch water pan, 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 Summary 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 Summary Project Report (SPR).
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 in regard to the proposed earth dam project.

MIN. 3 – 24/02/2026: PROJECT BRIEF AND BACKGROUND

The County Project Coordinator started by briefing the community members about the proposed project, he explained the project was part of the **BREFONS** program which aims at building resilience for food and nutrition; he further expounded on the 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 to support the efforts of the program to ensure cooperation during the construction phase and sustainability during the operation phase.

A community representative then provided the historical background of the Nyalilbuch water pan, highlighting that the water pan has been the main source of water for the region, however its capacity has kept on reducing due to continued siltation further limiting accessibility to clean and safe water. During dry spells they are forced to walk long distances in search of clean water for livestock and domestic use.

MIN. 4 - 24/02/2026: 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 desilting of the Nyalilbuch water pan:

1. **Improved Water Security:** Restoration of the dam will ensure reliable access to water for domestic use, livestock watering, and small-scale irrigation, particularly during prolonged dry seasons.
2. **Enhanced Agricultural Productivity:** Availability of water for irrigation is expected to

support increased production of Orange-Fleshed Sweet Potato (OFSP) and other crops, leading to improved household food security and nutrition.

3. **Improved Livelihoods and Income:** Increased agricultural output and livestock productivity will enhance household incomes and reduce vulnerability to climate-related shocks.
4. **Reduced Water Collection Burden:** The project will significantly reduce the distance and time spent, especially by women and children, in fetching water, allowing more time for productive and educational activities.
5. **Improved Livestock Health:** Reliable water supply will reduce livestock mortality and improve animal health and productivity, particularly during drought periods.
6. **Strengthened Climate Resilience:** Increased water storage capacity will enhance the community's resilience to recurrent droughts and erratic rainfall patterns experienced in the area.
7. **Community Empowerment and Ownership:** Community involvement in operation and maintenance will strengthen local capacity, ownership, and long-term sustainability of the water infrastructure.
8. **Environmental Improvement:** Proper management of runoff and controlled abstraction will reduce soil erosion and environmental degradation around the dam area.
9. **Support to Vulnerable Groups:** Improved access to water and enhanced food production will positively impact vulnerable households, including women-headed households and youth.

MIN 5 - 24/02/2026: CONCERNS, QUESTION & ANSWER SESSION AND RESPONSES

The ESIA Consultant invited community members to raise questions, concerns, and comments regarding the proposed desilting of the Nyalilbuch water pan 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.

The presentation from the project expert team was followed by a plenary session of question and answer as follows;

Table 1.1 Concerns by ESIA meeting attendants and Responses by Consultants

KEY ISSUE	QUESTIONS FROM THE COMMUNITY	RESPONSE FROM THE CONSULTANT TEAM
Risk of increased human-wildlife conflict	Community members living near the wildlife corridor raised fears that expanded water during dry spells would attract more wild animals (e.g. monkeys, crocodiles) closer to their homes and farms, increasing the risk of crop	The ESIA expert acknowledged this risk and committed to recommending the installation of appropriate wildlife-friendly barriers (e.g., a buffer zone with deterrent vegetation).

	raiding and danger.	
Influx of Non-Local Workers and Social Strains	Concerns were raised that an influx of external construction workers could lead to increased pressure on local resources, potential for communicable disease spread (e.g., HIV/AIDS), and social tensions with the host community	The Consultant assured the community that they will recommend enforcing of Worker's Code of Conduct to the contractor prioritizing local hiring to minimize influx. Additionally, will advise a community health and safety awareness program to be implemented, and regular engagement with local leaders be held to address any emerging social issues promptly.
Water contamination during construction	Community members raised concerns water being contaminated during the construction process from fuel leaks from the heavy machinery used due to possible poorly maintained machinery, fueling or possible machinery servicing while on site.	The ESIA Consultant acknowledged the concern and assured that the site will have designated fueling areas away from the pan, the construction team will have spill kits on site, machinery will be regularly serviced and inspected and servicing will be prohibited within 50m of the pan.
Occupational health and safety risks	Community members raised concerns in exposure to hazardous materials such as fumes from the machines during operations that could lead to long term health issues	The ESIA consultant was in agreement with the issue raised but assured strong recommendations that involved the construction team to provide the needed PPEs, install warning signages, fencing of deep excavations, conduct toolbox safety talks also have trained personnel on Fire safety, first aid and occupational health and safety while on site.
Increased risk of conflicts	Concerns were raised about possible conflicts over water use for domestic, livestock, and irrigation purposes.	The Client emphasized that a community-based water management committee should be formed after the project has been handed over to the community to help oversee equitable water allocation and develop simple water-use rules to minimize conflicts.

Land Encroachment	Some members sought clarification on land encroachment and whether the desilting works would affect private land nearby	It was clarified that the dam is located on voluntarily donated land and no additional land acquisition is anticipated.
Construction Impacts (Dust, Noise, Access)	Members expressed concern about dust, noise, and temporary disruption during construction.	The Contractor will implement mitigation measures including controlled working hours, watering of access roads to suppress dust, and adherence to occupational health and safety standards.
Employment Opportunities	Youth and women asked whether they would be given priority for employment during construction.	The Consultant promised to recommend that priority be given to the locals for unskilled and semi-skilled labor opportunities.
Environmental Degradation	Participants raised concerns about destruction of vegetation and disturbance to wildlife.	The Consultant explained that vegetation clearance will be minimized, disturbed areas rehabilitated after construction, and no protected or endangered species will be affected.
Operation and Maintenance	Members asked who would be responsible for maintaining the water pan after desilting and expansion.	It was explained that the community, through a registered management committee, will be trained on operation and maintenance, with support from the County Government and project partners.
Project Timeline	Community members asked how long the desilting works would take.	The Project coordinator stated that they are yet to get clarification on the project timelines and will give feedback as soon as possible. However, he stated that the usual timeline is 4 months

MIN 6 - 24/02/2026: SUGGESTIONS FROM MEMBERS IN ATTENDANCE

- . It was suggested that the contractor facilitate awareness sessions for both workers and the community on HIV/AIDS and other communicable diseases, potentially distributing condoms, to mitigate risks associated with the influx of workers.
- Members proposed the formation of a small CLC comprising community elders, youth, and women representatives to meet regularly with the contractor to discuss progress and resolve issues collaboratively.
- The community advised that when selecting local people for jobs, special consideration should be given to vulnerable households, such as those headed by women, persons with disabilities, or the youth.
- The community recommended the installation of clear safety signage, controlled access to the construction site, and community sensitization, particularly to safeguard children and livestock from potential construction-related hazards.
- If applicable in the area, members recommended that the fence design include specific gaps or passages (e.g., raised bottom wires or specific gates) to allow for the safe movement of small to medium-sized wildlife.
- Members advised that a strict zero-tolerance policy for alcohol and drugs on site be enforced, with visible signage and consequences for breach, to prevent accidents and anti-social behavior

MIN 7 – 24/02/2026: A.O.B AND ADJOURNMENT

There being no other business, the meeting ended with a word of prayer from one of the community members at 13:40hrs.

Signed by:



Mr. Erick O. Orwa

Environmental and Social
Safeguards Consultant



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)

PROJECT SPECIFIC SITE: ESIA FOR THE PROPOSED CONSTRUCTION OF NYALI BUCH WATER PAN

Date: 24/02/2026

Venue: RAMOR VILLAGE, BARINGO COUNTY



PUBLIC PARTICIPATION ATTENDANCE LIST

NO	NAME	DESIGNATION / VILLAGE	Gender M/F	Below 35 Years	Above 35 Years	TELEPHONE NUMBER	SIGNATURE / THUMB PRINT
1	Hesbon N. Monda	Director NEMA Baringo	M		✓	0727561832	
2	Elphas K. Ruttoh	ADA	M		✓	0726519150	
3	JACKSON KERTANY	CHIEF	M		✓	0726603561	
4	Vincent Abuje	ADA	M		✓	0725670000	
5	William Anaalo	Li	M		✓	0792434384	
6	Emuel O. Ounda	ESIA EXPERT	M	✓		0700033598	
7	Siti Altman	ESIA EXPERT	F	✓		0796247461	
8	JAMES K. SIRIKWO	SAMBORUWA	M		✓	0721475156	
9	Sammel Kimeru	Samborowa	M	✓		072074988	



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)

PROJECT SPECIFIC SITE: ESIA FOR THE PROPOSED CONSTRUCTION OF NYALIBUCH WATER PUMP

Date: 24/02/2026

Venue: RAMOR, VILLAGE, BARISSA COUNTY



PUBLIC PARTICIPATION ATTENDANCE LIST

NO	NAME	DESIGNATION / VILLAGE	Gender M/F	Below 35 Years	Above 35 Years	TELEPHONE NUMBER	SIGNATURE / THUMB PRINT
10	Richard Gogorek	Ramor	M		✓	0712645421	
11	Jonathan Kandauiwa	Ramor	M		✓	0714658490	
12	Dina Cheptoo	Ramor	F		✓	0700854526	
13	Phyllis Kangogo	Ramor	F	✓		0727793048	
14	Sammy KIPKOROR	Samborowa	M		✓	0715582105	
15	Peter Miningwa	Samborowa	M	✓		0705695655	
16	David Yegut	Ramor	M		✓	0726043868	
17	JOSEPH TERUTOI	Ramor	M		✓	0728562490	
18	Vina Jelimo	Ramor	F	✓		0716848333	



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)

PROJECT SPECIFIC SITE: ESIA FOR THE PROPOSED CONSTRUCTION OF NYALIBUCHI WATER PUMP

Date: 24/02/2026

Venue: RAMOR VILLAGE, BARINGO COUNTY

[Signature]
THE CHIEF
YATIA LOCATION
Date: *[Signature]*

PUBLIC PARTICIPATION ATTENDANCE LIST

NO	NAME	DESIGNATION / VILLAGE	Gender M/F	Below 35 Years	Above 35 Years	TELEPHONE NUMBER	SIGNATURE / THUMB PRINT
19	Arian Moses B.	Ramor	M	✓		0726 995162	<i>[Signature]</i>
20	Christine Chemose	Gamborowa	F		✓	0716 380599	<i>[Signature]</i>
21	Wilson Chelagat	RAMOR	M		✓	0728728422	<i>[Signature]</i>
22	Haron Kiboiwa	Samborowa	M	✓		0113613228	<i>[Signature]</i>
23	Eric O. Onda	LEAD EXPERT	M		✓	0721178524	<i>[Signature]</i>

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 Nyalibuch waterpan 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: Sammy KIPKORAR

Phone Number: 0715582105

Village: Sambarino Sub-County: Baringo North

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?
 - (i) Planting of trees and avail of water to livestock and wildlife.
 - (ii) Lead to development of the area, schools, hospitals and roads.
4. What Potential Negative Environmental and Socio-Economic impacts do you anticipate the project's implementation will generate?
 - (i) Very minimal negative effect, may be cutting of fire trees only.
 - (ii)
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 will benefit the community largely, about 5000 people.

Signature/ Thumb Print: [Signature]

Date:

24/02/2026.



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

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Respondent

Name: Silas Kang'o

Phone Number: 0726117824

Village: Samborwa Sub-County: Baringo North

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?

(i) Distance of water will be reduced makes people to access water easily

(ii) Development to the community like irrigation e.g. the planting of vegetables and etc.

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

(i) It can bring diseases like typhoid and cholera to the people

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.

To plant trees within the area

Signature/ Thumb Print: [Signature]

Date: 24/02/2020

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

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

Respondent

Name: Edward Chepsergon

Phone Number: 0718818357

Village: Samborowa Sub-County: Baringo North

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?
- Provide water for livestock
- Avail water for irrigation
4. What Potential Negative Environmental and Socio-Economic impacts do you anticipate the project's implementation will generate?
- loss of biodiversity
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.

Request the donor to expand the project

Signature/ Thumb Print: [Signature]

Date: 24/02/2026



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

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Respondent

Name: HILLARY KIPTOON

Phone Number: 0799848768

Village: RAMOR Sub-County: BARINGO NORTH

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. Irrigation

2. domestic use

3. livestock

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

1. Waterborn diseases

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/ Thumb Print:

Date: 24/02/2026

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

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Respondent

Name: *Richard Cheserek*

Phone Number: *0712645421*

Village: *Romor* Sub-County: *BARINGO NORTH*

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 is able for human consumption for drinking
- water is available for farming
- less time will be spent accessing water
- Businesses will be boosted during construction phase
4. What Potential Negative Environmental and Socio-Economic impacts do you anticipate the project's implementation will generate?
- Soil erosion
- Water-borne diseases
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/ Thumb Print: 

Date: *24/2/2026*

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 Nyalibuch water pan in Baringo County

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Respondent

Name: WKA TUNDO

Phone Number: 071530730

Village: Ramos Sub-County: Baringo North

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?
- Availability of water for livestock and farming
- It will assist in promoting economic status of the village
- It will assist in protecting the environment and promoting co-habitation in the village.
4. What Potential Negative Environmental and Socio-Economic impacts do you anticipate the project's implementation will generate?
→ There might be human transmitted disease
→ There might be conflict due to thefts of animals or construction tools by locals
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/ Thumb Print [Signature]

Date: 24/02/2026



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 Nyatibuch water pan 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.

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Respondent

Name: Samuel Kimani

Phone Number: 0720749869

Village: Samborowo Sub-County: Baringo North

- Do you support the proposed project in the area Yes (✓) No ()
- Within the area are there similar projects Yes () No (✓)
- What Potential Positive Environmental and Socio-Economic impacts do you anticipate the project's implementation will generate?
 - water will be easily available
 - Clean water for drinking
 - more social networks during construction
- What Potential Negative Environmental and Socio-Economic impacts do you anticipate the project's implementation will generate?
 - Theft
 - conflicts amongst communities
 - lack of access road
- In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ()
- Kindly give any other comments or suggestions you may have about the project.

Signature/ Thumb Print: [Signature]

Date: 24/6/2026



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 Nyalibuch waterpan 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.

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Respondent

Name: Peter Mwangi

Phone Number: 07 05095655

Village: Gamboruwo Sub-County: Baringo North

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?

- Availability of water for fish farming.
- Water for animals.
- Water for growing plants.

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

- Spread of HIV-Aids during construction period.

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 to start soon.

Signature/ Thumb Print: [Signature]

Date:

24/02/2026



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:

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Respondent

Name: Phyllis Kang'o

Phone Number: 0727793048

Village: Sub-County: Baringo North

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

1) Sufficient water for domestic use.
2) for farming
3) Livestock

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

1) Population increase, conflicts
2) Accidents, drowning
3)

- In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ()

- Kindly give any other comments or suggestions you may have about the project.

Signature/ Thumb Print: [Signature]

Date: 24/02/2020

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

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ESIA for the proposed construction of Nyalibouch watershed in Baringo County

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Respondent

Name: Christine Chemase

Phone Number: 0716390599

Village: Samborowa Sub-County: Baringo North

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?

mafi ya mbuzi, ng'mbe

mafi ya kufika uosaza na

mafi ya kupanda mboga

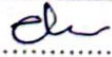
4. What Potential Negative Environmental and Socio-Economic impacts do you anticipate the project's implementation will generate?

nihaleta mbugu

watoto wataoza kuikaya ndani

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/ Thumb Print: 

Date: 24/2/2026

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

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Respondent

Name: Jonathan Kandekuru

Phone Number: 0714658490

Village: Ramor Sub-County: Baringo North

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 the distance travelling for water.
- Water is used for irrigation.
- Increase the livestock.
- Clean water for drinking.

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

- Soil erosion
- Water-borne disease will spread

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/ Thumb Print: [Signature]

Date: 24/02/2026



MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

STATE DEPARTMENT FOR AGRICULTURE

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Respondent

Name: Lina Jelimo

Phone Number: 0716684833

Village: Ramor

Sub-County: Baringo North

- Do you support the proposed project in the area Yes (✓) No ()
- Within the area are there similar projects Yes () No (✓)
- What Potential Positive Environmental and Socio-Economic impacts do you anticipate the project's implementation will generate?
1) Farming
2) Domestic
3) Livestock
- What Potential Negative Environmental and Socio-Economic impacts do you anticipate the project's implementation will generate?
1) Mosquito breeding
2) Drowning
- In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ()
- Kindly give any other comments or suggestions you may have about the project.

Signature/ Thumb Print:

Date: 24/02/2026

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 Nyalibuch waterpen 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

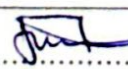
Respondent

Name: James Romen Sirikwo

Phone Number: 0721 475 186

Village: SAMBOROWA Sub-County: BARINGO NORTH

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) less time used to collect water
(2) used for irrigation
(3) used for human consumption
4. What Potential Negative Environmental and Socio-Economic impacts do you anticipate the project's implementation will generate?
(1) cause soil erosion within the surrounding area
(2) water-borne 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/ Thumb Print: 

Date: 24/02/2021

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 Nyalibuchi water pan 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.

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Respondent

Name: WILSON CHEALAT

Phone Number: 0728728422

Village: RAMOR Sub-County: BARINGO NORTH

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?

- Reduced distance in search of the vital commodity - water

- Accessibility to clean water in the areas - Ramor, Sambowod and Kapkomon villages

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

- Risking of people's - growing cases if not fenced and protected

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.

- Introduction of piping infrastructure to reach homesteads.

Signature/ Thumb Print: [Signature]

Date: 24/02/2026.

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 Nyalibush waterpaw 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: Allan Moses Barichire

Phone Number: 0726 995162

Village: Romor Sub-County: Baringo North

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 fish farming.

- Easy access to water.

- Animals will have available water for drinking.

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

- HIV/AIDS spread during construction process.

- Delay of construction by the government.

- Lack of water during construction period.

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.

Start the project soon.

Signature/ Thumb Print: [Signature]

Date: 24/02/2026

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 Nyalibandi waterpan 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: Dina Cheptoo

Phone Number: 0700854526

Village: Ramor

Sub-County: Baringo North

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) Sufficient water for domestic use
2) Livestock use
3) Farming / crop farming
4) Control erosion
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/ Thumb Print: 

Date: 24/02/2026

Appendix V: Lead Expert and Associate Expert NEMA Licenses

	
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
M/S Erick Odhiambo Orwa (individual or firm) of (address) P.O.BOX 46213, 00100,Nairobi General Post Office is licensed to practice in the capacity of a Lead Expert registration number NEMA/ENVIS/EL/0491 in accordance with the provision of the Environmental Management and Coordination Act cap 387. Issued Date: 15th January 2026 Expiry Date: 31st December 2026	
 David Ongare For DIRECTOR GENERAL National Environment Management Authority	
 ISO 9001 : 2015 Certified	



NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

ENVIRONMENT MANAGEMENT AND COORDINATION ACT, Cap 387

Experts License - Associate/Lead Experts

License No.: **NEMA/ENVIS/EL/0249**

Application Reference No: **NEMA/ENVIS/ELA/03086**

M/S Siti Athuman Mwarora

(individual or firm) of (address) **P.O.BOX 96542, 80110, Likoni**

is licensed to practice in the capacity of a **Associate Expert** registration number **NEMA/ENVIS/EL/0249** in accordance with the provision of the Environmental Management and Coordination Act cap 387.

Issued Date: **5th January 2026**

Expiry Date: **31st December 2026**

David Ongare

For DIRECTOR GENERAL

National Environment Management Authority

P.T.O.



ISO 9001 : 2015 Certified

Appendix VI: Photo Gallery



The Area Assistant Chief calling the public baraza to order at Ramor Village.



Biophysical surrounding of the water pan.



Vegetation cover in the area. Being mostly the desert date.



Access roads to the proposed project site



Soil Structure of the proposed project site showing evidence of soil erosion.



Rocky terrain of the proposed project site.



Village elder of Ramor Village explaining to the community members the importance of the project in the vernacular language



Community members engaging in public participation showing consent to the anticipated project

Appendix VII: 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 heritage¹

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 heritage²

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.

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 VIII: ESIA Inspection form

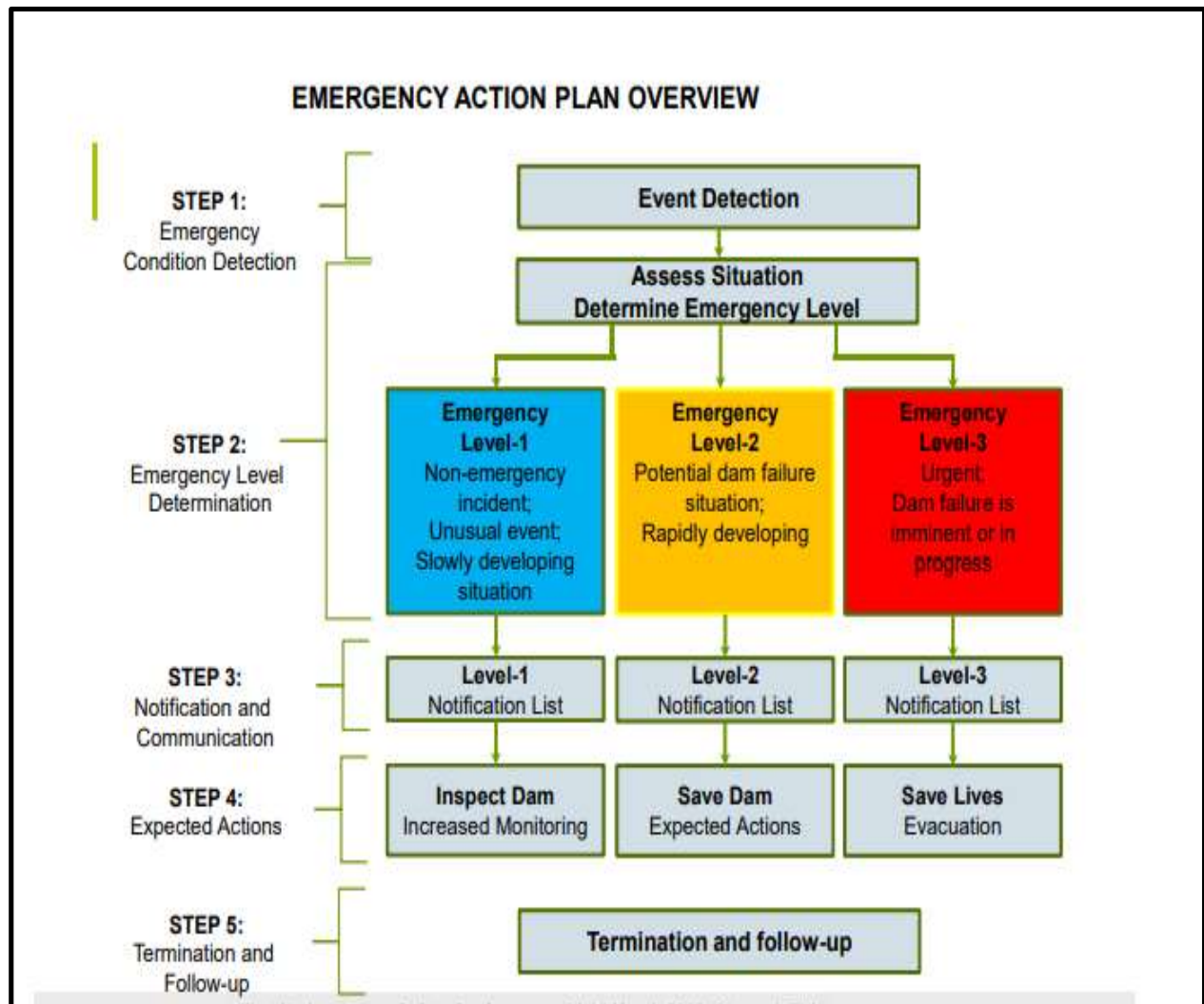
WATER PAN NAME:		DATE	
MONITORED BY:		WATER LEVEL:	
ITEM	CONDITION	ACTION REQUIRED	BY WHOM
CATCHMENT AREA			
Erosion			
EMBANKMENT (cracks, vegetation, erosion, slumps, leaks, animals)			
Crest			
Downstream slope			
Upstream slope			
Lining Material			
SPILLWAY (debris, vegetation, erosion)			
Sill 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 Pan			
SIGNED BY			

Appendix IX: Nyalilbuch Water Pan Crisis Action Plan (CAP)

A crisis action plan for Nyalilbuch Water Pan should be developed and should consist of:

1. Contact names and telephone numbers (owner of the Nyalilbuch Water Pan, 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.

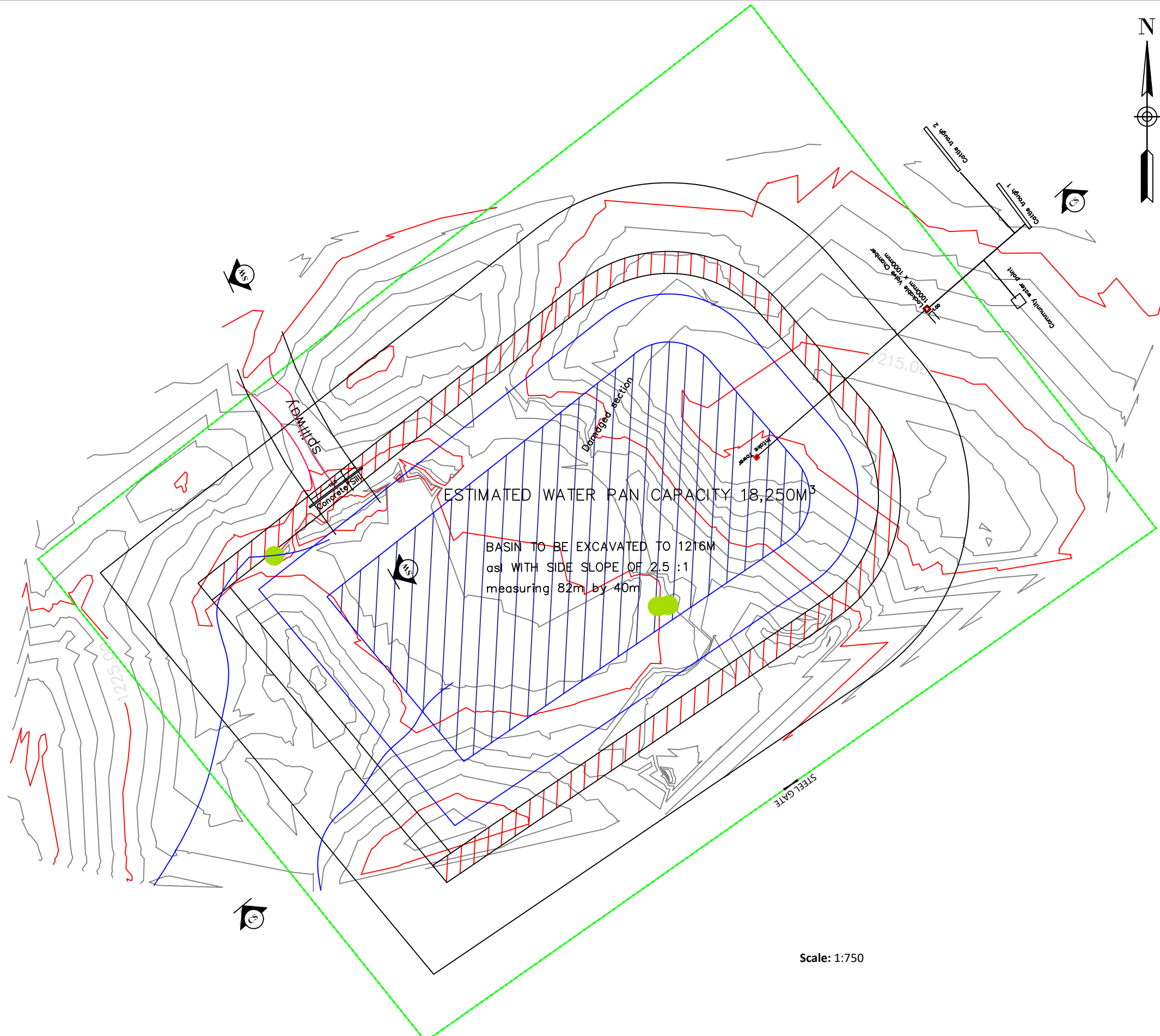
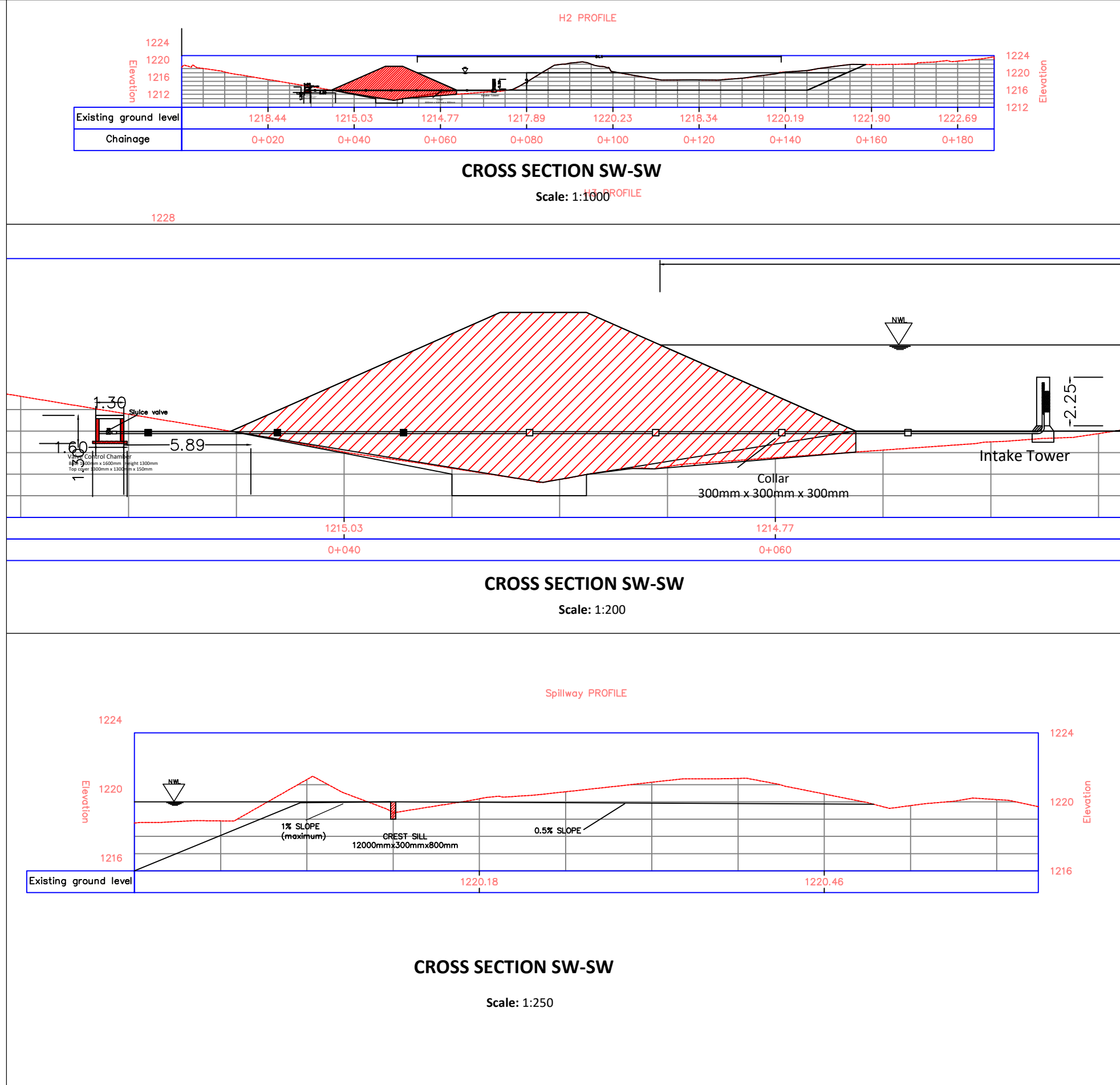
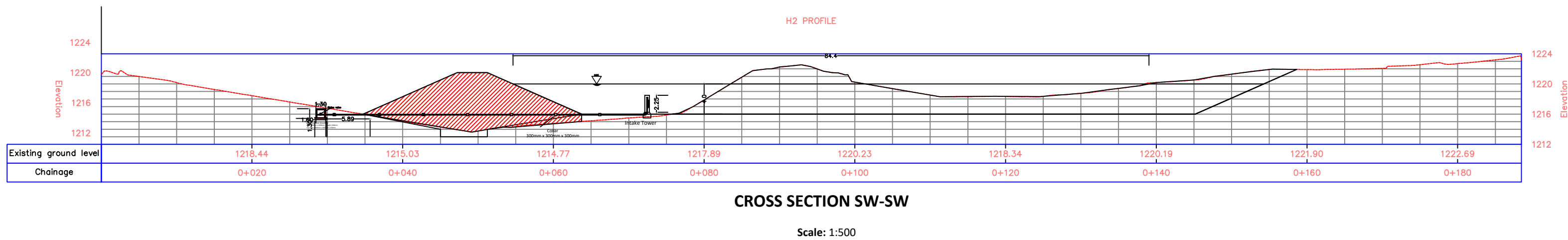
Appendix X: Overview of Emergency Action Plan that will apply to the Water Pan



Source EGIS

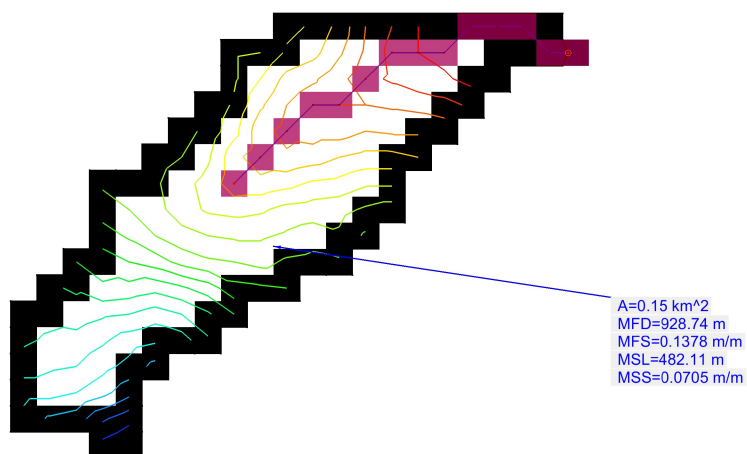
Appendix XI: Nyalilbuch Water Pan Drawings and Design

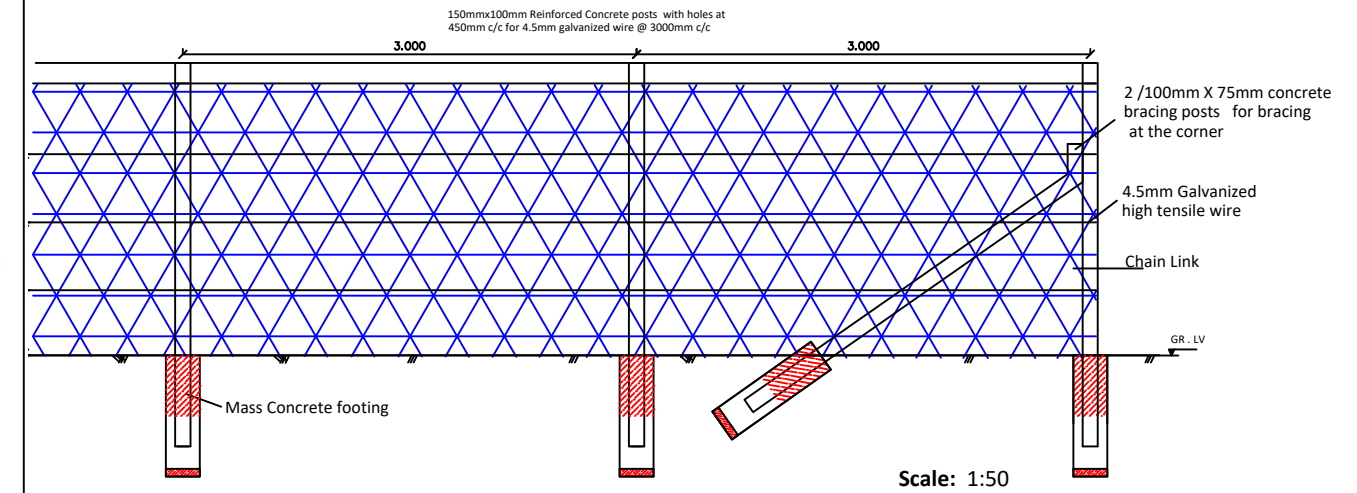
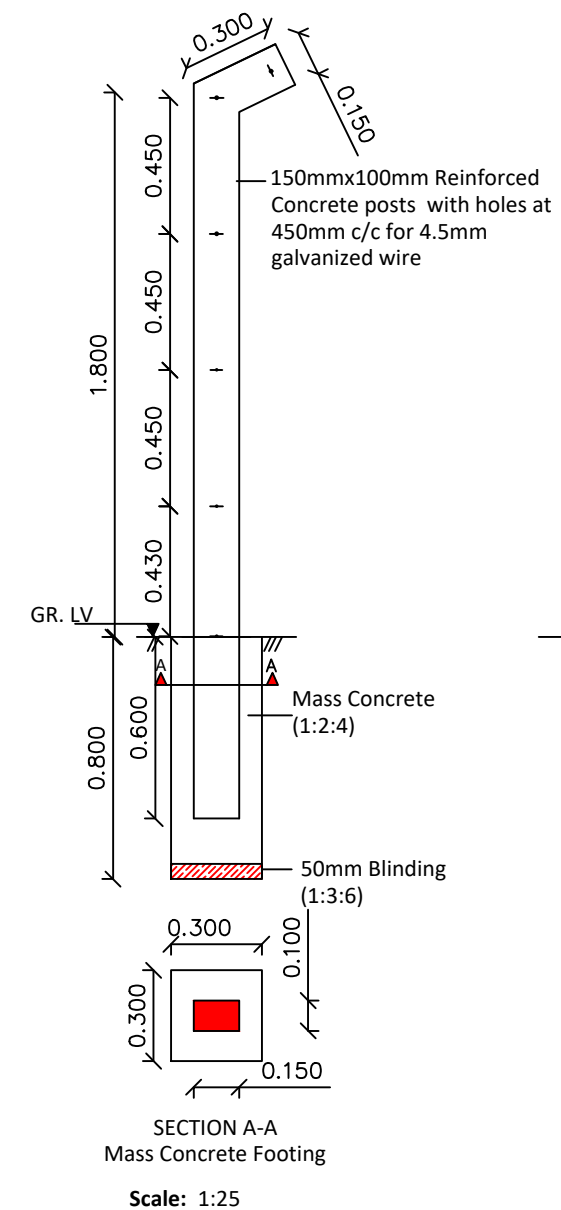
ATTACHED



- NOTES:**
1. Depth of the embankment is 5.5m
 2. All the materials removed from the pan will be used to build the pan embankment
 3. Add 5% of soil to the centre of the embankment crest to allow for settlement.
 4. Materials for building the embankment will be excavated from the identified borrow area within and next to the pan

CLIENT: PROJECT COORDINATOR BUILDING RESILIENCE FOR FOOD AND NUTRITION SECURITY (BREFONS) P.O.BOX 30028-00100, NAIROBI	COUNTY: BARINGO	PROJECT NAME: NYALILPUGH WATER PAN CAPACITY : 18,250 CUBIC METRES	Surveyed by: Alphonce .K.		Date: March, 2025
	SUB COUNTY: BARINGO NRTH		Designed and drawn by: Eng Tonui W.K		Checked by: Eng Kebeney J.
	WARD: SAIMO SOI	DRAWING TITLE: TOPOMAP & PAN PROFILES	Scale: As shown	Date drawn: March, 2025	
			DRWG NO: 01	Rev. 0	Sheet No. 1





- | | | |
|-------------|--------|--------------|
| DRWG NO: 01 | Rev. 0 | Sheet No. 01 |
|-------------|--------|--------------|