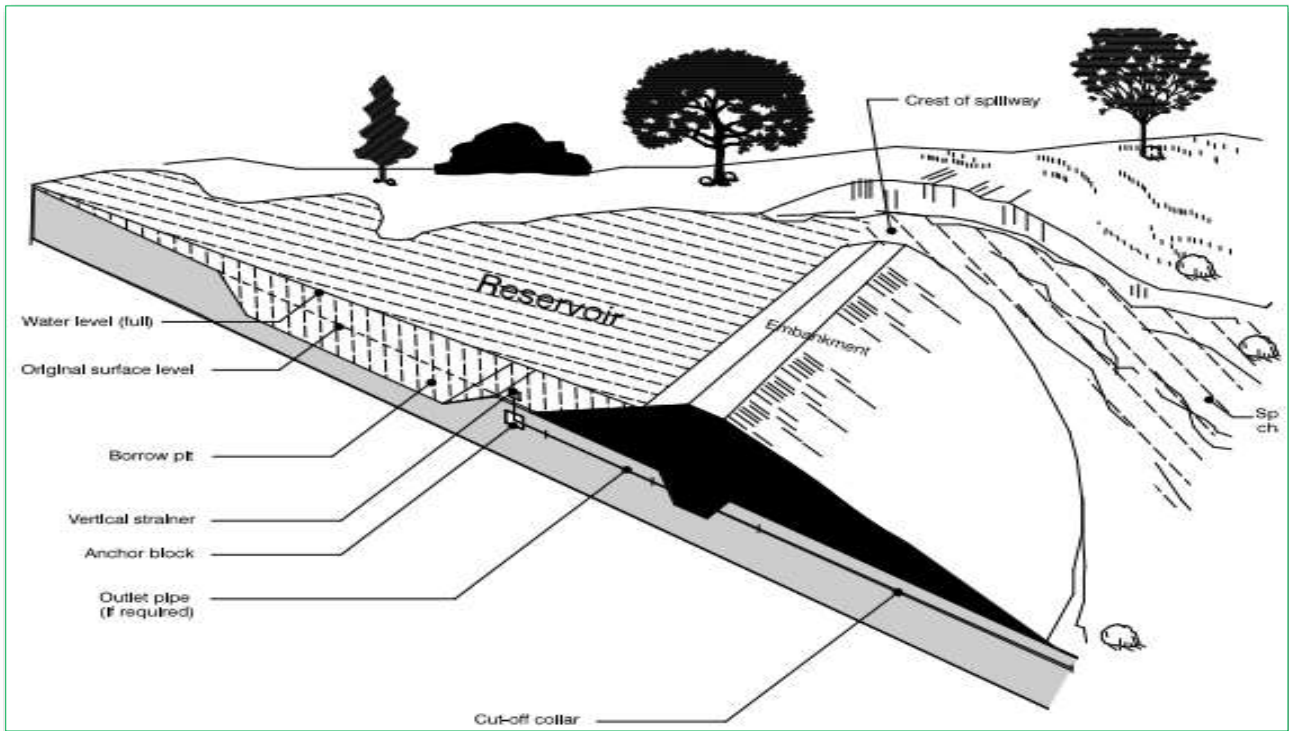




**KENYA CLIMATE SMART AGRICULTURE PROJECT, KCSAP
COMPREHENSIVE PROJECT REPORT FOR THE PROPOSED
DEVELOPMENT OF FUNAN IDHA EARTH DAM LOCATED WITHIN FUNAN
IDHA AREA ALONG MARSABIT-MOYALE ROAD, URAN WARD, MOYALE**



SUB COUNTY, AND MARSABIT COUNTY.

Cover Picture: Impression of the proposed Earth Dam (Source: Marsabit County Govt, 2021)
GPS Coordinates: Latitude 3.335666° N Longitude: 38.441222

PROPONENT:

FUNAN-IDHA PROJECT MANAGEMENT COMMITTEE
P. O. BOX 384-60500
MARSABIT

SUBMITTED TO:

THE COUNTY DIRECTOR OF ENVIRONMENT
NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY, NEMA
MARSABIT COUNTY

REPORT PREPARED AND SUBMITTED BY:

**MUGUN HOLDINGS LIMITED.
MARCH 2021**

CERTIFICATION

The following Comprehensive Project Report (CPR) has been prepared with authority from the proponent for presentation to the National Environment Management Authority (NEMA).

ASSIGNMENT: To carry out and prepare a Comprehensive Project Report (CPR) for the proposed development of Funan-Idha Earth Dam in compliance with the legal requirements.


REPORT TITLE: Comprehensive Project Report for the proposed development of Funan-Idha Earth Dam within Uran Ward, Moyale Sub-County, and Marsabit County.

PROPONENT: Funan-Idha Project Management Committee
CLIENT: Kenya Climate Smart Agriculture Project
P O Box 384-60500, Marsabit

CONTACT PERSON: Wato Denge Halake, Coordinator, KCSAP

Signed:  Date: 9.4.2021 

PREPARED BY: Mugun Holdings Limited, NEMA Registration No. 8332

Signed:  Date: 09.04.2021



Disclaimer:

This Environmental and Social Impact Assessment Comprehensive Project Report is strictly confidential to Kenya Climate Smart Agriculture Project and any use of the materials thereof should be strictly in accordance with the agreement between the KCSAP and Mugun Holdings Limited (the firm of experts). It is, however, subject to conditions in Legal Notice No. 101 section 4 of the Environmental (Impact Assessment and Audit) Regulation 2003(revised 2019

ACKNOWLEDGEMENT

We, the ESIA-CPR study Team, wish to acknowledge and express our profound gratitude to the Marsabit County Project Coordinating Unit of Kenya Climate Smart Agriculture Project (KCSAP) for commissioning this ESIA-CPR study.

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

We would also like to affirm our appreciation to the National Project Coordinating Unit, World Bank ESIA Experts, County Review Team – Orbora Thomas (Department of Environment) and Ento Juma (CESSCO) for their reviews and contributions towards the study.

Finally, we wish to appreciate the contributions made by the entire Funan-Idha community for providing us with useful information by filling out questionnaires during the field visits and their participation in Public Barazas on the project.

TABLE OF CONTENTS

CERTIFICATION	2
ACKNOWLEDGEMENT	3
ACRONYMS AND ABBREVIATION.....	7
EXECUTIVE SUMMARY	8
CHAPTER ONE.....	11
1.0 Introduction	11
1.2 Project Objectives	12
1.3 Project Justification.....	12
1.4 Terms of Reference	12
1.5 Study Approach and Methodology	12
1.6 ESIA organization and structure	15
CHAPTER TWO: PROJECT DESCRIPTION.....	16
2.1 Project Location	16
2.2 Site Description,) and Land Ownership.....	16
2.3 Project Design.....	17
2.4 Project Activities	17
2.5 Project Cost.....	18
2.6 Proposed Project Activities	18
2.7 Catchment protection.....	18
CHAPTER THREE: LEGAL, REGULATORY, INSTITUTIONAL AND POLICY FRAMEWORK	20
3.1 General Overview.	20
3.2 Environmental Policy and Legal Frameworks.....	20
3.2.1 The Public Health Act (Cap 242).....	20
3.2.2 Water Act (2016)	21
3.2.3 The Environmental Management and Coordination Act (EMCA, 1999) (amendment 2015) ...	22
3.3.4 Land Tenure and Land Use Legislation Acts.....	22

3.3.5 The Government Lands Act (Cap. 280)	23
3.3.13 Sessional Paper No. 4 of 2004 on Energy	24
3.3.14 Environmental Impact Assessment and Audit Regulations 2003 (revised 2019).....	24
(Legal Notice No. 31 & 32)	24
3.5 <i>Institutional Arrangements</i>	25
3.6 <i>World Bank Safeguard Policies</i>	26
3.7 <i>International Laws and Guidelines</i>	30
3.7.1 Ramsar Convention on Wetlands.....	30
3.7.2 Paris Agreement on Climate Change	30
3.7.3 Convention on Biological Diversity	30
3.7.4 Sustainable Development Goal 5 Targets	31
CHAPTER FOUR: BASELINE INFORMATION	32
4.1 <i>Position and Size</i>	32
4.2 <i>Position of Marsabit County</i>	32
4.3 <i>Topography, Geology & Soils</i>	32
3.4 <i>Climatic Conditions</i>	33
3.3 <i>Administrative and Political Units</i>	34
CHAPTER FIVE: PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATION	39
5.1 <i>Introduction</i>	39
5.2 <i>Objectives</i>	39
5.3 <i>Methodology</i>	39
CHAPTER SIX: ANTICIPATED IMPACTS AND MITIGATION MEASURES	42
6.1 <i>Impacts during the construction/construction phase</i>	42
6.2 <i>Impacts crosscutting construction and operation</i>	44
6.3 <i>Impacts during operation</i>	47
6.4 <i>Decommissioning phase</i>	51
CHAPTER SEVEN: ANALYSIS OF PROPOSED PROJECT ALTERNATIVES	52

CHAPTER EIGHT: ENVIRONMENTAL AND SOCIAL MANAGEMENT & MONITORING PLAN(ESMMP)	55
8.1 Environmental management	55
8.2 Annual environmental audits	55
8.3 Environmental and Social Management & Monitoring Plan	57
CHAPTER NINE: CONCLUSION AND RECOMMENDATIONS	73
9.1 Conclusion	73
9.2 Recommendations	73
ANNEX 1: PUBLIC PARTICIPATION MINUTES OF THE MEETING	75
ANNEX 2: PUBLIC PARTICIPATION ATTENDANCE LIST	77
ANNEX 3: LAND RESOLUTION CONSENT AGREEMENT FORM	79
ANNEX 4: SAMPLE QUESTIONNAIRES	82
ANNEX 6: PROJECT DESIGN	88
ANNEX 7: PHOTOS	92

ACRONYMS AND ABBREVIATION

CIDP	County Integrated Development Plan
CMS	Convention on Migratory Species
COVID	Corona Virus Disease
CPCU	County Project Coordination Unit
CSA	Climate Smart Agriculture
CSR	Corporate Social Responsibility
CPR	Comprehensive Project Report
EAs	Environmental Assessments
EMCA	Environmental Management and Coordination Act, 1999 Revised, 2015
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FGD	Focused Group Discussion
GDP	Gross Domestic Product
GHG	Greenhouse Gases
IFC	International Finance Corporation
KCSAP	Kenya Climate Smart Agriculture Project
Km	Kilometers
Km ²	Square Kilometers
M	Meters
M	Million
m ³	Cubic Meter
MEA	Multilateral Environmental Agreements
Mm	Millimeter
MOALF	Ministry of Agriculture, Livestock and Fisheries
NEAP	National Environmental Action Plan
NEMA	National Environment Management Authority
PDO	Project Development Objective
PEPB	Pest Control Products Board
PPE	Personal Protective Equipment
RCC	Reinforced Cement Concrete
SESA	Strategic Environmental and Social Assessment
TOR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization

EXECUTIVE SUMMARY

Earth fill dam, also called Earth Dam, or Embankment Dam, dam built up by compacting successive layers of earth, using the most impervious materials to form a core and placing more permeable substances on the upstream and downstream sides. A facing of crushed stone prevents erosion by wind or rain, and an ample spillway, usually of concrete, protects against catastrophic washout should the water overtop the dam.

Dams or reservoirs are widely used to preserve surplus rainfall. They can be constructed with a variety of materials and in many different ways. Usually it is reckoned to be a highly technical and expensive job, but this need not necessarily be so. However, it must be remembered that a body of water is a potential danger if the dam breaks and therefore construction should not be undertaken lightheartedly.

The ESIA for proposed development of Funan Idha Earth Dam will provide water storage to be used by the neighbouring community for domestic and agricultural purposes and is intended to provide water for 500 households, 10,000 cattle, 35,000 sheep and 7,500 camels. The proposed project will help collect water from two streams for utilization by the community for domestic and agricultural purposes. This activity is listed under Schedule II of Kenya's Environmental Management and Co-ordination Act, 1999. This Environmental Impact Assessment Project study has been undertaken by the proponent in compliance with Kenya's environmental framework legislation.

Environmental and Social Impact Assessment (ESIA) is a decision-making support instrument which aims at identifying, predicting, evaluating and mitigating the biophysical, social and other relevant environmental effects of development proposals prior to commencement of a project. It aims to:

- Ensure that environmental considerations are explicitly addressed and incorporated into the development decision-making process;
- Anticipate and minimize or offset the adverse significant biophysical, social and other relevant effects of development proposals;
- Protect the productivity and capacity of natural systems and the ecological processes which maintain their functions; and promote development that is sustainable, optimizing resource use and management opportunities.

Environmental Management and Coordination Act 1999 provides for legal and institutional framework for environmental management in Kenya. Under this Act the National Environmental Management Authority (NEMA) and mandated to oversee and coordinate environmental management in Kenya. Among its duties NEMA reviews all environmental impact assessment reports of projects listed under the second schedule of the Act and issues an EIA license approving the projects.

Section 58 (1) of EMCA 1999 states “*Notwithstanding any approval, permit or license granted under this Act or any other law in force in Kenya, any person, being a proponent of a project, shall before for an financing, commencing, proceeding with, carrying out, executing or conducting or causing to be financed, commenced, proceeded with, carried out, executed or conducted by another person any undertaking specified in the Second Schedule to this Act, submit a project report to the Authority, in the prescribed form and giving the prescribed information*”.

In compliance the project proponent has engaged a team of experts to carry out an Environmental Impact Assessment prepare the report and submit project report to NEMA for approval and licensing.

The following is a summary of environmental impacts associated with the construction and operation of the proposed dam and a brief description of their mitigation measures:

Area of concern	Proposed mitigation measures
Impact on terrestrial and aquatic ecosystems	<ul style="list-style-type: none"> • Maintain the demarcation line, and ensure that no personnel or construction materials move outside the designated site • Water quality and aquatic ecosystem monitoring • Any plants or trees of value, close to the construction area must not be disturbed, defaced, destroyed or removed for the duration
Influx of people and social problems during construction	<ul style="list-style-type: none"> • Coordinate and monitor labour and social issues • Carry out initial stakeholder analysis and conduct socio-environmental survey • Ensure that final design does not disadvantage downstream communities. • Educate workers on the cultural sensitivities in the host communities.
Dust and noise	<ul style="list-style-type: none"> • Regular maintenance of vehicles and machinery used for construction • Limit working to daytime
Landscaping	<ul style="list-style-type: none"> • Make safe all borrow pits, quarries and dangerous excavations by backfilling, grading • Monitor backfilled areas for subsidence (as the backfill settles) and fill depressions using available material • Shape all disturbed areas to blend in with the surrounding landscape.
Soil conservation	<ul style="list-style-type: none"> • Do not strip topsoil when it is wet • Co-ordinate Works to limit unnecessarily prolonged exposure of stripped areas and stockpiles • Excavate and backfill trenches on a progressive basis • Do not stockpile topsoil in drainage lines • Do not stockpile topsoil in heaps exceeding 2 m in height

Area of concern	Proposed mitigation measures
Creation of habitats for disease vectors	<ul style="list-style-type: none"> • Monitor the presence of disease vectors • Install a spillway to ensures continuous flows, hence reduced likelihood of creation of habitats for bilharzias is remote
Siltation and sedimentation	<ul style="list-style-type: none"> • Ensure proper drainage • Establish grass plantation, creepers and trees to prevent washing away of materials from sloped surfaces and along canal banks • Periodic monitoring and clearing silts and sediments • Install sediment traps in fields and canals

This report provides an assessment of both benefits and potential negative impacts anticipated as a result of the proposed construction of a dam. The findings of the assessment conclude that the identified significant impacts can be addressed with relevant proposed mitigation measures, therefore, no environmental concerns should prevent the proposed project from proceeding.

The ESMMP should be included in the contract of the contractor(s) appointed to construct the proposed dam. The ESMMP will be used to monitor compliance with environmental legislations and management guidelines. The implementation of the ESMMP is crucial for the life cycle of the project and is fundamental in achieving the environmental management standards as set out in this report. In order to maintain involvement of the community in the implementation of the project, it is recommended that communication with the local community and adjacent landowners be maintained during the construction and operational phases through the management committee.

CHAPTER ONE

1.0 Introduction

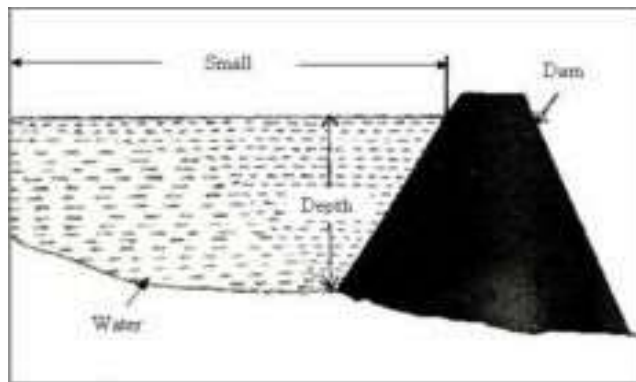
The County Government of Marsabit, through the Kenya Climate Smart Agriculture Project, a World Bank-funded project, intends to construct an Earth Dam at Funan-Idha in Uran ward to increase surface water storage for both domestic and livestock consumption and to increase agricultural productivity and build resilience to climate change risks in the targeted smallholder pastoral communities in Marsabit county. The proponent for the proposed project is Funan-Idha pastoral community and neighboring areas and managed through established project management committee.

Small-dams are structures that are constructed across streams/rivers to create artificial lake or reservoir behind themselves. The purposes which these reservoirs are meant to serve may be either for flood control or conservation purposes. Conservation of water may be required for any one or more of the following purposes-domestic water supply and livestock water supply.

Selection of a suitable dam site

In order to get a suitable area for construction of the dam, the following factors have to be considered: a) The catchment area must contain few residents and livestock in order to avoid the possibility of soil erosion and siltation. Alternatively, where cultivation is taking place, soil and water conservation measures must be implemented. The measures include: construction of stone barriers, strip-cultivation, construction of contour bunds etc.

b) A good earth-dam should have a high depth to length ratio. That is, the surface area should be small but the water depth should be very deep to ensure that more water is stored, as shown below.



This CPR project report provides relevant baseline information of the project anticipated impacts on the environment and social aspects, appropriate mitigation measures necessary for incorporation into the project implementation, as well as a comprehensive

environmental and social management and monitoring plan.

provides area, aspects, measures into the well as a

Approval will, therefore, be sought because environmental performance will be assured throughout the project phases by implementing the environmental and social management actions and monitoring programs recommended in this report as well as undertaking subsequent environmental audits.

1.2 Project Objectives

The main objective of the proposed project is to develop an Earth Dam in Funan Idha area for storage of water for use by the local community for both domestic and Livestock and small-scale irrigation to increase livestock and agricultural production as well as income generation. This will promote livestock and meat value chains for Uran ward beneficiaries. This will effectively contribute to the regional and national socio-economic development in line with the KCSAP objectives. The proposed project will serve approximately 500 households, 35,000 herds of cattle, 30,000 goats and 7,500 camels.

1.3 Project Justification

The screening process was undertaken to assess whether the proposed Funan-Idha Earth Dam sub-project needed to be subjected to an ESIA study or not. Based on the literature review and Legal Notice 31 of 30th April 2019, it is categorized as a Medium-risk project, hence Comprehensive Project Report (CPR) development was recommended.

Lack of water is the largest constraint to sustainable livelihoods within the proposed project area. Rapid runoff during the rainy season frequently results in a high proportion going to waste or even becoming destructive. Soil erosion and decreases in soil fertility are severe problems associated with surface runoff. Harvesting rainwater presents opportunities to address both water scarcity and soil degradation at the proposed project area. The harvested water may be used for many purposes but reliable water storage facilities are required.

The proposed dam construction project may trigger activities which may significantly impact on the environment. The project activities in its entirety will consist of various works, including the site marking, site clearing, excavation of soil and site fencing.

The most significant environmental issues concerning dam construction include changes in stream morphology, changes in local hydrological conditions, sedimentation, loss of ecological corridors and fragmentation of habitats, creation of income generating opportunities, social pathologies arising from population influx, and waste generation. These calls for an environmental impact assessment since the scale of impacts require mitigation measures to be planned and implemented.

1.4 Terms of Reference

The CPR was undertaken in accordance with the requirements of the Government of Kenya in conformity with the National Environment Management Authority (NEMA) guidelines following the requirements of the Environmental Management and Coordination Act (EMCA), 1999 (Revised 2015) which makes it mandatory for such projects to undergo ESIA CPR process.

1.5 Study Approach and Methodology

The study approach and methodology for this exercise were structured such as to cover the requirements under EMCA, 1999 (Revised 2015) as well as the ESIA/Audit regulations as stipulated under the Gazette Notice No. 56 of 13th June 2003.

This largely involved an understanding of the project background, the preliminary designs, and the implementation plan as well as commissioning. Besides, baseline information was obtained through physical investigation of the site and the surrounding areas, public

consultation (which included local administration, community opinion leaders, youth's representatives, and VMGs; Minutes of Meeting Held at Walda Location: During Public Participation, Attendance List and filled in questionnaires, as well as photos were obtained. A total of 15 questionnaires were administered and all were filled and returned. Due to observation of Covid protocols a total number of 20 participants who include key community opinion leaders encompassing of 17 males and 3 Females participated in the community public sensitization forum.

The key activities undertaken during the assessment included:

- a) Literature Review: A detailed review of available documentation;
- b) Consultations with the Proponent regarding the proposed project details, the site planning and implementation plan;
- c) Interviews and consultations with the local community surrounding the water pan as well as representatives of various organizations;
- d) Physical inspections of the proposed site;
- e) Evaluation of the activities around the site and the environmental setting of the wider area through physical observations as well as from existing information in literature; and
- f) Reporting, review and submissions.

Below is a typical outline of the basic ESIA steps that were followed during this assessment:

Step 1: Environmental Screening

This is the first stage when the proposed project was evaluated guided by EMCA 1999(Revised 2015). In screening, we tried to confirm whether or not a particular project falls within a category that requires an ESIA before commencement. Water Pans are listed under schedule 2 of EMCA, 1999 (Revised 2015) and *in legal notice no. 31 of April 30, 2019, that categorized water pans as low risks projects among projects requiring an ESIA.*

In addition, the World Bank provided a checklist used for screening of the project as attached in Annex 9 of this report. Other considerations during the screening process included physical site location, environmental sensitivity of the areas surrounding the proposed site, nature of community and social activities in the project area.

Step 2: Environmental Scoping

Scoping, a result of a preliminary physical assessment of the site and its surroundings helps to narrow down to the most critical environmental and social issues requiring attention for detailed evaluation. The ESIA team conducted a reconnaissance survey accompanied by officials from the Kenya Climate Smart Agriculture Project KCSAP Marsabit County whereby the latter provided an overview of the proposed project and took the team on a tour of the site. The scoping exercise concluded with a review of the Terms of Reference (TOR) that had been developed.

Step 3: Desk Study

Documentation review is a continuous exercise that involves a review of available documents on the project, including approved plans/designs, land ownership documentation, project plans and designs, environmental legislation and regulations, etc. The review provided an understanding of the terms of reference, environmental and social status, demographic trends, land-use practices, development strategies and plans as well as the policy and legal documents.

Step 4: Field Assessment

With the background obtained from preliminary visits, discussions and documentation, the proposed project site was comprehensively evaluated and the administration and community interviewed. The proposed development was evaluated with a view to establishing the physical environment status, social and economic trends. The field assessment was also designed to establish potential positive and negative impacts through interviews, discussions and physical observation

Step 5: Baseline Conditions

Physical inspections and observations constitute the exercise for collecting baseline information. Household Questionnaires were also administered.

Step 6: Consultations

Three approaches were used for the public consultation process: personal interviews with the local administration; public meetings with the local community; and a stakeholder workshop (see Annex 2). Meetings with relevant government offices and consultations with the local community were undertaken to establish the general public opinion with respect to the project. Among the major issues addressed included social, economic benefits, values of the project and compatibility with other undertakings in the area as well as any other perceived impacts of the project to the welfare of the people.

The scope of activities for this assessment entailed;

- ✓ Description of the proposed project
- ✓ Description of the physical, biological and social environment
- ✓ Description of pertinent Legislative and Regulatory Considerations:
- ✓ Determination of the Potential Environmental Impacts of the Proposed Project:
- ✓ Analysis of the occupational health and safety concerns
- ✓ Development of environmental and social management plan to mitigate negative impacts
- ✓ Development of the ESIA monitoring plan.

1.6 ESIA organization and structure

The CPR was carried out to full completion within a period of twenty (21) days from the date of undertaking. The Consultant (Lead Expert) coordinated the day-to-day functions and any related institutional support matters. Otherwise, all formal communications were directed to NEMA through the proponent.

This CPR is organized under various sections that encompass;

- ✓ Executive Summary
- ✓ Introduction
- ✓ Project Description
- ✓ Legal, Regulatory, Institutional and Policy Framework
- ✓ Baseline Information
- ✓ Public Participation and Stakeholder Consultation
- ✓ Anticipated impacts and mitigation measures
- ✓ Analysis of proposed sub-projects alternatives
- ✓ Environmental and Social Management, and Monitoring Plan, and;
- ✓ Conclusions and Recommendations

CHAPTER TWO: PROJECT DESCRIPTION

2.1 Project Location

The project is located in Marsabit County, Moyale Sub County, Uran Ward in Funan-Idha location. The project site is accessed through the paved A2 Marsabit-Moyale Road, 6km North East of the road.

The project site is located at GPS Coordinates of Latitude **3.335666** and Longitude **38.441222**



Figure 1: Sketch map, source Google Earth

2.2 Site Description,) and Land Ownership

The site selected for the project had the following desirable characteristics;

A presence of a natural depression where water collects during the rainy seasons. This showed that with the excavation of reservoir water could collect in it with little effort.

Presence of Soils, sandy clay to clay loam and indication of substantially high water holding capacity for retention by an excavated Earth Dam. The soils also showed the presence of organic matter that could support fodder production.

A fairly large catchment area (about 2.0km²) able provide enough runoff (about 80,330m³) that could fill the targeted Earth Dam meant to serve as water source for the project.

Adequate land was set aside by the community for Earth Dam excavation, fodder production, watering point for domestic and livestock use, and placement of other necessary accessories e.g. toilets for both genders. The community land consent/agreement was met between KCSAP and the beneficiary community, in the presence of area local leadership.

2.3 Project Design

The proposed reservoir area falls within a pastoral setting. The estimated capacity of the proposed dam is about 48, 670m³. The reservoir will be used to provide water for domestic and Livestock uses. The dam will be fenced and gated to control access and for security and safety reasons.

2.4 Project Activities

The activities associated with the proposed project have been categorized under three phases of project implementation viz a vis planning, excavation & embankment construction, auxiliary works construction, operation, closure/decommissioning as discussed below.

Planning Phase

The main activities considered during this phase are: Dam sitting, and production of site layout drawing. The Dam sitting involved reviewing and survey of the project area, identification of suitable Dam site, and determination of the required Dam configuration so as to achieve the desired results.

This was done by engineers from the relevant ministries to include Agriculture, Livestock & Fisheries, and Water & Sanitation, and Public Works.

Construction Phase

Construction phase entails the following activities:

- a) Equipment mobilization
- b) Establishment of the project management committee
- c) Transportation and delivery of materials to the site
- d) Excavation
- e) Embankment construction
- f) Construction of Axillary works– (fence, Water tank, water trough, draw tap and toilets)

Operation Phase

After the successful construction of the Earth Dam and runoff collection in the Dam, the community will be allowed to access the water through the community tap access point and livestock through the water troughs. The activities will be managed by a Project management committee which is already in place.

Decommissioning Phase

Decommissioning of the constructed Funan-Idha Earth Dam will become necessary if or when the Dam attains its end of life i.e. when it is no longer in use or when the need arises. Once this occurs, the affected Dam will be deactivated according to the Dam closure procedure. Non-reusable pipes will be sold to licensed scrap metal dealers. The closure of the Dam will involve removing the piping system and backfilling of the depression left behind as necessary. The Dam site will be landscaped and replanted with suitable indigenous grass and trees.

2.5 Project Cost

Capital costs for the **Proposed Funan-Idha Earth Dam** are based on the following unit costs; Mobilization & Excavation Works, Construction of Embankment, Draw-Off Works with a Cattle Trough and Watering Points & Reticulation Works. The proposed project is estimated to cost a sum of **Kenya Shillings Sixty Million, (KSh. 60,000,000) Only.**

2.6 Proposed Project Activities

2.6.1 Site Clearing

The Contractor shall undertake remove of trees, hedges, bushes and shrubs and clear the site of the works at such time and to the extent required by the Engineer but not otherwise, subject to the provisions of the Conditions of Contract: the materials so obtained shall so far as suitable be reserved and stacked for further use; all rubbish and materials for use shall be destroyed or removed from the site, as directed by the Engineer. Site clearing will include top soil removal to a minimum depth of 20cm. part of the swampy land will be reclaimed for use as agricultural land.

Where top soil will be excavated it shall be removed and stacked on site. After completion of construction, it shall be spread over the disturbed ground, any surplus being disposed of as is discussed in this report.

2.6.2 Excavation

The contractor shall, wherever the engineer considers it practicable, carry out the excavation in such a manner that the suitable materials are placed separately for use in the works without contamination by the unsuitable materials. All excavations shall be kept free from water, from whatever source, at all times during construction of works.

2.6.3 Earthworks and embankment construction

This includes placement and compaction of embankment fill, grading, and all ancillary items required to prepare the embankment to the design elevations and limits indicated on the drawings.

2.6.4 Dam crest

The Contractor shall provide embankment crest with unseived gravel for the movement of pedestrians and animals without causing erosion of embankment crest.

2.6.5 Spillway

Spillway is a dam safety valve. A spillway will be sited at a distance of the dam wall to avoid flood water eroding the embankment. Further protection from erosion will be achieved by building a low wall of large stones set in mortar along the side of the spillway next to the embankment.

2.7 Catchment protection

2.7.1 Soil conservation

Catchment protection is important in reducing soil erosion and siltation of dam reservoirs. The protection can consist of digging trenches, making terraces and planting of grasses or trees in rows along the contours. It also includes the building of check dams and silt traps in gullies. All land-users in a catchment area should be encouraged to participate in all the soil conservation activities, including the maintenance of structures and vegetation cover.

The silt traps will reduce the speed of the inflow water thereby giving soil particles time to settle in and above the silt traps. After flooding, most of the accumulated silt will be removed and used for fertilizing adjacent farmland if possible.

2.8 Reservoir protection/hygiene and sanitation components

2.8.1 Fencing the reservoir

The proposed reservoir will be fenced to keep off livestock. This will help to maintain better quality water and avoids the risk of livestock drowning/polluting the water.

2.9 Project materials, storage and equipment

2.9.1 Materials and equipment

Earth moving equipment including excavators, tractors, trucks, Graders, Dozer/ excavator Loader, Tractor/Dump, Truck, Water truck among others will be used. All materials and equipment furnished under the contract shall be constructed and finished in a workman like manner. Materials shall be suitable for the service intended and selected and fabricated in accordance with the best engineering practice. Material shall be environmentally clean and free of refuse, debris, organic matter, frozen material, and miscellaneous or deleterious materials

2.9.2 Material Storage and Job Sites

The Contractor shall construct secure fences and provide guards to ensure the security of the materials storage yards and all fixed job sites. Open trenches shall have barricades around them to prevent people or cars from accidentally falling in at night.

2.10 Proposed project products

The proposed construction project will result in a viable dam for water harvesting and storage, a protected spring for clean water supply for domestic use and agricultural purposes. The site will also be fenced and gated to regulate access.

2.10.1 Water Usage

The proposed dam will be used for water supply for livestock and domestic use by the local community.

CHAPTER THREE: LEGAL, REGULATORY, INSTITUTIONAL AND POLICY FRAMEWORK

Legal and Institutional Issues

3.1 General Overview.

The social pillar of the National Vision 2030 takes cognizance of the need to achieve macro and sectoral objectives without compromising the good status of the environment. This is because of the fact that Kenya faces environmental challenges due to deforestation, soil erosion, siltation of water reservoirs, pollution of river systems from industrial effluents and raw sewage discharge and this causes the eutrophication of the lacustrine and riverine systems.

In the above regard the Government has been in the process of addressing the environmental pollution problems through the development of the National Environmental Action Plan (GoK, 1994), the Sessional Paper No. 6 of 1999 on Environment and Development (GoK, 1999), and the enactment of the Environmental Management and Coordination Act (EMCA, 1999) which provides for Environmental Impact Assessment (EIA) and Environmental Audits (EA) of proposed and existing projects respectively.

Further, Kenya is committed to implement recommendations from global initiatives on environmentally sustainable development, such as those based on the UN Conference on Human Environment held in 1972 in Stockholm, Sweden, the Earth Summit held in 1993 in Rio de Janeiro, Brazil, the World Summit for Sustainable Development (WSSD) held in Johannesburg 2002 and the United Nations Millennium Summit held in 2000, wherein nearly all world leaders endorsed a set of eight time-bound and measurable goals, namely; “The Millennium Development Goals”, or MDG’s so as to combat environmental degradation, amongst other global problems. The 7th Goal of the New Millennium is particularly poignant in this respect.

3.2 Environmental Policy and Legal Frameworks

Kenya has about 77 statutes dealing with environmental issues. The most pertinent legislative instruments on environmental management in this regard are: The Agriculture Act, the Factories Act, the Public Health Act and the Water Act, 2002. Others are the Radiation Protection Act, the Employment Act (Cap. 226), the Regulation of Wages and Conditions of Employment Act (Cap. 229), the Penal Code and the Environmental Management and Co-ordination Act (EMCA), 1999 as administered by the National Environment Management Authority (NEMA). These statutes are essentially Sectoral and a selected set are briefly discussed here.

3.2.1 The Public Health Act (Cap 242)

The Public Health Act borrows heavily from the common law of nuisance of the English law, where nuisance is broadly understood to mean:

- Obstruction,
- Smell/ odours
- Accumulation of waste or refuse,
- Smokey chimneys,
- Dirty dwellings
- Premises used without sanitation,

- Factories emitting smoke or smell
- Crowded or unkempt cemetery,

The law therefore makes it an offence for the land/ premise owner or occupier to allow nuisance or any other predisposing condition injurious to health in his premise. As regards, a medical officer or a Public Health Officer notified and convinced that there exists a danger in the premises can issue a notice for the nuisance to be removed, failure of which the MoH can take the matter to Court. In this regard, the Court shall summon the proponent and may order that the nuisance be removed or that the proponent puts up structures that would lead to the permanent removal of the nuisance. In extreme cases the Court may order that the activities in the environment be suspended until satisfactory corrective measures are affected and approved or that such structure are demolished completely.

This Act also empowers every local authority now the devolved units to make by-laws with regard to the above, in addition to and or consistent with standards like those of buildings, waste and sanitation including effluent discharge standards from factories within its jurisdiction. The protection of water supplies is also bestowed on local authorities or Water Supply Providers that are licensed as regards. In this regard, the Act empowers the Minister of Health to make rules that compel local authorities to prohibit the following: bathing, washing clothes, watering animals, erection of dwellings, sanitary conveniences, stables and cattle kraals, dipping tanks, factories and other works that may pollute water supply. The haphazard disposal of manure, and filth or noxious offensive matter is also covered by the Act. Environmental Health is part of the duties of the Local Authority and they have a responsibility through the Local Authority Act Cap 256 to maintain sanitary services, sewerage and drainage facilities and take measures for the control and destruction of rats, vermin etc.

3.2.2 Water Act (2016)

The Water Act 2016 vests the rights of all water to the state and the power to control all water bodies is with the Minister in charge of water resources who acts as a custodian on behalf of the state. The said powers are exercised through the Minister and the Director of Water Resources in consultation with the Water Resources Management Authority (WRMA) and the various regional water catchments areas/ Boards. The Act aims at among others:

- i. Provision for conservation of water
- ii. Apportionment and use of water resources
- iii. Prevention of water pollution
- iv. Water Supply Provision

To actualize the Water Act to realize its aims, the Minister is given the power to appoint catchment area management agents or undertakers of water supply, which in most cases are Water User Associations (WUAs) or Water Supply Providers (WSPs) respectively unless they are otherwise incapacitated. Further, in order to provide water security and adequacy in supply, the Minister may declare particular water catchment areas as protected areas and restrict activities in those areas.

Pollution of any water course is an offence under the Act, and it thus prohibits the throwing, conveying, causing to or permitting to throw rubbish, dirt, refuse, effluents and wastes to any body of water. The Act enhances the Ministry's capacity for enforcement of the same by allowing for the review of the water user fees and polluter payer penalties.

This Act empowers the Water Service Providers as well as local authorities to provide and maintain sanitation and sewerage services and to take measures to control or prohibit factories and industries or other infrastructures from emitting smoke, fumes, chemicals, gases, dust, smell, noise, vibrations or any danger, discomfort or annoyance to the neighbourhood. The Act also allows the local Authority/ WSP the power to control public infections by particularly using cyanide as well as empower them to punish the disruption of sanitation or sewerage lines. It also compels developers to construct internal sewage lines to empty into the Local Authority's sewer systems and drainages.

3.2.3 The Environmental Management and Coordination Act (EMCA, 1999) (amendment 2015)

The Environmental Management and Coordination Act (EMCA, 1999) is the most recent environmental law. Its formulation started in 1993, when the National Environmental Action Plan (NEAP) was finalized and ratified under the Ministry of Environment and Natural Resources. The major objective of the NEAP was to address environmental and conservation challenges through appropriate legislative and institutional measures. In 1996, NEAP guided the drafting of the Environmental Management and Coordination Bill, which was enacted by Parliament into law in 1999 as the Environmental Management and Coordination Act.

The main objective of this Act is the establishment of an appropriate legal and institutional framework for the management of the environment in Kenya. The Act further aims to improve the legal and administrative coordination of the diverse sectoral initiatives in the field of environment so as to enhance the national capacity for its effective management. In addition, the Act seeks to harmonize all the 77 sector specific legislations touching on the environment in a manner designed to ensure greater protection of the environment. This is in line with national objectives and sustainable development goals enunciated in the Agenda 21 of the Earth Summit held in Rio de Janeiro in 1992. The ultimate objective is to provide a framework for integrating environmental considerations into the country's overall economic and social development.

In terms of environmental management, the EMCA Act, 1999, provides a comprehensive and an appropriately harmonized legal and institutional framework for the handling of all environmental issues in Kenya and covers all sectoral laws. Part VI (Section 68) of the Act makes it mandatory for an Environmental Impact Assessment (EIA) to be conducted for proposed projects. Specific water related project requiring EIA include, water transfer projects, dam construction and flood control schemes. In addition to the said provision in law, Section 3 of the EMCA Act gives the Kenyan public the authority to bring into legal action whether or not a person has directly suffered personal loss or injury from action or omission of the defendant with respect to the environment.

It is in the above regard, that due care has to be taken by the project proponents to check against any risks to the populace whether directly or indirectly and this is very well achieved by way of a sustained EIA whereby impacts are identified and mitigation measures proposed.

3.3.4 Land Tenure and Land Use Legislation Acts

The Kenyan constitution provides for the protection of private property from deprivation without lawful compensation. The constitution also provides that such property may be "acquired if it is necessary in the public interest of; defence, security, and morality". In this regard, it is noteworthy

to mention that land is a crucial national resource that is basic to the livelihood and well-being of Kenyans and its tenure and use should be explicit. The following are some of the essential statutes that regulate land ownership and land use in Kenya:

3.3.5 The Government Lands Act (Cap. 280)

Under this Act, the President through the Commissioner of Lands may allocate any un-alienated land to any person he so wishes. Once allocated, such land is held as a grant from the government on payment of such rents as the government may announce. However, the government may recall the land at any time for its own use. The Act covers both agricultural land and town plots within local authorities, which are allocated on application by interested persons. Presently, such land is held for a maximum period of ninety-nine years, subject to renewal. Such allocations have often disregarded social and environmental imperatives, leading to degradation, inequity and other undesirable impacts on the land.

3.3.6 The Registered Land Act (Cap. 300)

Under this Act, any person may acquire absolute ownership of any land once he has been registered as the absolute owner. On registration, such a person acquires freehold interests on the land. A subsequent buyer of the same land acquires the same rights as enjoyed by the previous owner.

3.3.7 The Trust Land Act (Cap 285)

The Kenya Constitution vests all land which is not registered under any Act of Parliament under the ownership of relevant Local Authorities as “Trust Land”. Under the Act, a person may acquire leasehold interest for a specific number of years subject to renewals, normally 99 years under the provisions of the new constitution. However, the local authorities retain the powers to repossess such land for their own use should any need arise.

3.3.8 The Land Acquisition Act (Cap. 295)

This Act gives powers to the government to acquire any person’s land for public utilities. The Act however stipulates that once such land is acquired, prompt and full compensation shall be paid to the owner.

3.7.9 Land Planning Act 2019

The operative clauses of this Act are contained in the Development and Use of Land (Planning) Regulations, which provides that land be dealt with either under an area plan or town plan and superintended by an interim planning authority.

Under this Act, all developments or any form of land use in the designated areas are subject to approval by the interim planning authority or the Central Authority (the overall governing body under the Act) in the absence of an interim planning authority. The Central Authority shall decide instances under which the proposal is to be referred to the relevant Local Authority. As regards, any change of use or actual development without authority is prohibited. Similarly, deposition of refuse, scrap or waste materials in a designated area without the consent of the planning authority or the relevant local authority is prohibited under this Act.

3.3.10 The Forest Act 2016

This act ratified in 2007 embraces the concept of participatory forest management. Communities are encouraged to form and register community forest associations. These registered associations can apply to participate in the conservation and management of forest resources and reserve. It is noteworthy that the communities managing the forests are also allowed to access the resources.

3.3.11 The Forest Rules 2009

The Forests (Participation in Sustainable Forest Management) Rules of 2009 are a comprehensive set of rules that govern both the private sector and community participation in the management of the forest reserves. It also outlines the structure for Community Forest Management Agreements.

3.3.12 The Wild Life (Conservation and Management) Act of 2013

The Wild Life (Conservation and Management) Act No 16 of 1985 is the main legal force behind the management and administration of national parks in Kenya. Apart from setting out the mandate of for KWS, the act also sets the parameters for hunting, developments inside parks, general regulations, offences and punishments. The day to day management of national parks and reserves are governed by Part III (National parks, national reserves, and local sanctuaries) and Part IV (Control of hunting).

3.3.13 Sessional Paper No. 4 of 2004 on Energy

The proponent should incorporate some conservation measures on electricity consumption as espoused by this Sessional Paper. The paper refers to measures on energy conservation and efficiency and aims at reducing energy consumption without sacrificing productivity or increasing costs. Energy conservation and efficiencies measures have the potential to scale down capital investments needed to provide additional supplies and reduce overall response use. The facility shall be operated with this policy in mind.

3.3.14 Environmental Impact Assessment and Audit Regulations 2003 (revised 2019).

(Legal Notice No. 31 & 32)

Regulation 24 on EIA licensing states that environmental Impact License shall be issued after the authority approves the study report under regulations 23, and shall be issued in form and accompanied by the prescribed fee of 0.1% of the total cost of the project. Section 87 provides for the proponent to adhere to the disposal of wastes requirement in such a manner as not to cause pollution to the environment or ill health.

3.3.15 The National Environmental Action Plan (NEAP).

The NEAP was a deliberate policy effort to integrate environmental considerations into the country's economic and social development. The integration process was to be achieved through a multi-sectoral approach to develop a comprehensive framework to ensure that environmental management and conservation of natural resources are an integral part of societal decision making. Issues of environmental integrity have been addressed by this project as part of a wider approach to respond to the goals of the National Environmental Action plan (NEAP).

3.4 The National Biodiversity Strategy

The overall objective of the National Biodiversity Strategy and Action Plan is to address the national and international undertakings elaborated in article 6 of the Convention on Biological Diversity. It is the national framework of action for the implementation of the convention to ensure that the present rate of biodiversity loss is reversed and the present levels of biodiversity resources are maintained at sustainable levels for posterity. The strategy recognizes the important role played by protected areas in the conservation of biological resources. This includes strengthening marketing wild life tourism while developing mechanisms of sharing benefits accruing from these activities.

3.5 Institutional Arrangements

At present, there are over 20 institutions and departments that deal with environmental issues in Kenya. Some of the key institutions include: The Ministry of Health; the Ministry of Labour, Department of Occupational Health and Safety; the Ministry of livestock and Fisheries Development, Fisheries Department; the Kenya Agricultural Research Institute (KARI)); the Ministry of Water and Irrigation and the Ministry of Tourism and Wildlife, Kenya Wildlife Service (KWS).

Others are the Ministry of Environment and Natural Resources, Forestry Department; Kenya Marine and Fisheries Research Institute (KMFRI); the Kenya Forestry Research Institute (KEFRI); the National Museums of Kenya (NMK); the Regional Development Authorities and the Public Universities. In addition to the said departments, the Ministry of Environment and Natural Resources through the National Environment Management Authority (NEMA) is responsible for the overall environmental management and coordination.

There are also local and International NGOs involved in environmental issues in Kenya. Some of the main international agencies involved in environmental issues in the Country include: The United Nations Environment Programmes (UNEP), the International Union for the Conservation of Nature and Natural Resources (IUCN) and the Environmental Liaison Centre International (ELCI). The regional and local NGOs actively involved in environmental matters in the Kenyan Country include: The East African Wildlife society (EAWS), the Green Belt Movement, the Forest Action Network (FAN), the African Water Network (AWN) and the Wildlife Clubs of Kenya (WCK) among others.

The water sector is governed by an elaborate institutional structure as spelt out in the Water Act of 2002. The apex body in the sector is Water Resources Management Authority (WRMA). It administers the sector through various decentralized water services boards and water utility providers. The act provides a role to the communities to participate in the management of the through water resources through the community Water Resources Users Associations (WRUAs). The project promoters have taken cognizance of all the above initiatives by the central government. They have taken a pledge to abide by all the legislative and institutional governance that have a bearing on the proposed project.

3.6 World Bank Safeguard Policies

The World Bank and IFC has well set safeguard policies aimed at ensuring the organization's funded projects adhere to environmental and social protection. These safeguards include;

3.6.1 World Bank Safeguard Policy 4.01 – Environmental Assessment

This policy is applied to any country undertaking a project that is world Bank funded should ensure that development projects are sustainable and environmentally sound. Although its operational policies and requirements vary in certain respects, the World Bank follows a relatively standard procedure for the preparation and approval of an environmental assessment study

The World Bank considers environmental and social impact assessment (ESIA) as one among a range of instruments for environmental assessment. Other instruments used by the World Bank include regional or sectoral environmental assessment, strategic environmental and social assessment (SESA), environmental audit, hazard or risk assessment, environmental management plan (EMP) and environmental and social management framework (ESMF). The Bank undertakes environmental screening of each proposed project to determine the appropriate extent and type of environmental assessment. Proposed projects are classified into one of three categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

The proposed project falls under:

- Category B: the proposed project is likely to have minimal or no adverse environmental impacts. beyond screening, no further environmental assessment action is required for a Category B project

Environmental Assessment is used in the World Bank to identify, avoid, and mitigate the potential negative environmental associated with Bank lending operations. Screening was done for the proposed project and fell under category B and this triggered the ESIA process and this conforms with the requirement of OP. 4.01 for world bank operational guidelines.

The project screened the project for environmental and social risks and on the basis prepared an ESIA which is the subject of this report. The report has established all the significant impacts that need to be addressed and proposed appropriate measures to prevent or reduce any risk that may be posed to the environment (physical, biological and social). The adverse impacts and their mitigation measures are well outlined in the ESMP including responsible parties, duration and cost in the whole project cycle. The project has also consulted the public on this ESIA report as required by the policy.

3.6.2 Bank Safeguard Policy 4.04 – Natural Habitats

The natural habitats policy is meant to enhance environmentally sustainable development through protection, conservation, maintenance and rehabilitation of natural habitat and their functions. World Bank supported developments are required to take considers and ensures

conservation of biodiversity as well as the diverse environmental services and products that the natural habitats present to the communities

The policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water area where most of the native plant and animal species are still present).

To ensure conservation and project sustainability, the policy requires that:

- i. Project alternative be sought when working in fragile environment areas;
- ii. Key stakeholders are engaged in project design, implementation, monitoring and evaluation including mitigation planning.

The project is an Excavation of an Earth Dam and is already allocated in a settled area which is not naturally sensitive. This project has no notable interaction with notable natural habitats apart from limited localized Riverine aquatic systems.

3.6.3 Bank Safeguard Policy 4.11 – Physical Cultural Resources

This policy assists in preserving physical cultural resources and helps reduce chances of their destruction. The policy considers Physical Cultural Resources (PCR) to be resources of archaeological, paleontological, historical, architectural, and religious (including graveyards and burial sites), aesthetic or other cultural significance.

There were no recorded physical cultural resources within the project location but in case during excavations they get into contact with such scenarios, the project should be halted temporarily and the National Museums of Kenya be consulted before further developments. Therefore, the contractor will be provided with the chance finds guidelines.

3.6.4 Bank Safeguard Policy OP/BP 4.12 – Involuntary Resettlement

The objective of this policy to avoid where feasible, or minimize, exploring all viable alternative Project designs, to avoid resettlement. This policy is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts.

The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Project appraisal of proposed projects. The objective of this policy to avoid where feasible, or minimize, exploring all viable alternative Project designs, to avoid resettlement. This policy is triggered when a Project activity causes the involuntary taking of land and other assets resulting in: Relocation or loss of shelter, loss of assets or access to assets, loss of income sources or means of livelihood, whether or not the affected persons must move to another location, and loss of land

This safeguard is not triggered by the project as the proposed project site does not affect or displace any PAP, nor anticipated to cause any livelihood or economic loss for it is in a public land set aside for such a utility.

3.6.3 Banks Operational Policy OP/BP 4.09 (Pests Control Management)

The policy is meant to minimize and manage the environmental and health risks associated with pesticides use and promote and support safe, effective and environmentally sound pest management. To ensure conservation and project sustainability, the policy requires that:

- iii. Project alternative be sought when working in fragile environment areas;
- iv. . Key stakeholders are engaged in project design, implementation, monitoring and evaluation including mitigation planning.

The project is an Excavation of an Earth Dam and is already allocated in a settled area which is not naturally sensitive. This project has no notable interaction with notable natural habitats apart from limited localized Riverine aquatic systems.

3.6.4 Bank Safeguard Policy 4.11 – Physical Cultural Resources

This policy assists in preserving physical cultural resources and helps reduce chances of their destruction. The policy considers Physical Cultural Resources (PCR) to be resources of archaeological, paleontological, historical, architectural, and religious (including graveyards and burial sites), aesthetic or other cultural significance.

There were no recorded physical cultural resources within the project location but in case during excavations they get into contact with such scenarios, the project should be halted temporarily and the National Museums of Kenya be consulted before further developments. Therefore, the contractor will be provided with the chance finds guidelines.

3.6.5 Bank Safeguard Policy 4.12 – Involuntary Resettlement

The objective of this policy to avoid where feasible, or minimize, exploring all viable alternative Project designs, to avoid resettlement. This policy is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts.

The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Project appraisal of proposed projects. The objective of this policy to avoid where feasible, or minimize, exploring all viable alternative Project designs, to avoid resettlement. This policy is triggered when a Project activity causes the involuntary taking of land and other assets resulting

in: Relocation or loss of shelter, loss of assets or access to assets, loss of income sources or means of livelihood, whether or not the affected persons must move to another location, and loss of land

This safeguard is not triggered by the project as the proposed project site does not affect or displace any PAP, nor anticipated to cause any livelihood or economic loss for it is in a public land set aside for such a utility.

3.6.6 Banks Operational Policy OP/BP 4.09 (Pests Control Management)

The policy is meant to minimize and manage the environmental and health risks associated with pesticides use and promote and support safe, effective and environmentally sound pest management.

Activities triggering World Bank Safeguards

The matrix below presents the extent to which the World Bank safeguards apply to the implementation of the Funan-Idha Earth Dam Project. The safeguards triggering matrix is presented in Table 4.2.

Table 4.2: World Bank Safeguards Triggering Matrix

Policy	Triggered	Discussions
Environmental Assessment (OP/BP 4.01)	Yes	The project components will trigger EA safeguards and is Category B due to the localized nature of the impacts.
OP/BP 4.04 (Natural Habitats)	No	There are no notable natural habitats as per the definition of the Bank
Involuntary Resettlement (OP4.12)	No	The project is to be rehabilitated and therefore no resettlement.
Physical Cultural Resources (OP/BP4.11)	No	Investigations during the ESIA showed that there are no known cultural resources on the site. However, shall precautionary provide chance finds guidelines.
OP/BP 4.09 (Pests Control Management)	Yes	During project operation in the case of crop production, there will be minimal use of chemicals for pest and disease control on crops planted.

3.7 International Laws and Guidelines

This section gives an additional guidelines /international laws/multilateral environmental agreement to be adhered to in the proposed project.

3.7.1 Ramsar Convention on Wetlands

This is an inter-governmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Ramsar Convention is the only global environmental treaty that deals with a particular ecosystem. The treaty was adopted in the Iranian city of Ramsar in 1971 and the Convention's member countries cover all geographic regions of the planet.

Unlike the other global environmental conventions, Ramsar is not affiliated with the United Nations system of Multilateral Environmental Agreements (MEA), but it works very closely with the other MEAs and is a full partner among the "biodiversity-related cluster" of treaties and agreements.

The subproject is located in an area which is not considered a wet land moreover the project through internal seepage may contribute toward underground water

3.7.2 Paris Agreement on Climate Change

The **Paris Agreement** deals with greenhouse-gas-emissions mitigation, adaptation, and finance, signed in 2016. The Paris Agreement's long-term temperature goal is to keep the increase in global average temperature to well below 2 °C above pre-industrial levels; and to pursue efforts to limit the increase to

1.5 °C, recognizing that this would substantially reduce the risks and impacts of climate change. This should be done by reducing emissions as soon as possible, in order to "achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases" in the second half of the 21st century. It also aims to increase the ability of parties to adapt to the adverse impacts of climate change, and make "finance flows consistent with a pathway towards low greenhouse gas emissions and climate- resilient development." Under the Paris Agreement, each country must determine, plan, and regularly report on the contribution that it undertakes to mitigate global warming.

The contractor will be required to use efficient machineries at the same time solar water pumping system will be encouraged to avoid carbon-based fuels. Tree planting will also be encouraged in the project area for uptake of carbon. The Earth Dam is itself an adaptation measure and its implementation will contribute to realizing Adaptation Goal of the Agreement

3.7.3 Convention on Biological Diversity

In response to the growing threat posed by human activity to biodiversity and inspired by the world community's growing commitment to sustainable development, during the 1992 Earth

Summit in Rio de Janeiro world leaders adopted the Convention on Biological Diversity (CBD). It is the most important Convention dealing with biodiversity conservation.

The Convention has three main objectives:

- To conserve biological diversity
- To use biological diversity in a sustainable way

To share the benefits of biological diversity fairly and equitably.

3.7.4 Sustainable Development Goal 5 Targets

Table 4.3: Sustainable Development Goal 5 Targets

GOAL 5: Achieve gender equality and empower all women and girls	
Target 5.1	End all forms of discrimination against women and girls everywhere
Target 5.2	Eliminate all forms of violence against women and girls in the public and private spheres, including trafficking, sexual and other types of exploitation
Target 5.3	Eliminate harmful practices, such as child, early and forced marriage and Female Genital Mutilation
Target 5.4	Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate
Target 5.5	Ensure women’s full and effective participation and equal opportunities for leadership at all levels of decision-making including political, economic and public life
Target 5.6	Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development, the Beijing Platform for Action and the outcome documents of their review conferences

- Goal 6: Ensure availability and sustainable management of water and sanitation for all;
- Goal 9: Build resilient infrastructure, promote inclusive sustainable industrialization, and foster innovation;

Public participation during the undertaking of this CPR included women and children. Women will also be considered for equal employment opportunities once the project commences. The project will provide water to the community with access points for both people and livestock as well as sanitary facilities at the site.

CHAPTER FOUR: BASELINE INFORMATION

4.1 Position and Size

The County of Marsabit in Kenya has a total area of 70,961.2Km² and occupies the extreme part of Northern Kenya. It has an international boundary with Ethiopia to the North, borders Lake Turkana to the West, Samburu County to the South and Wajir and Isiolo Counties to the East. It lies between latitude 02° 45° North and 04° 27° North and longitude 37° 57° East and 39° 21° East. The map in Figure 1 shows the location of Marsabit County within the map of Kenya.

4.2 Position of Marsabit County

Moyale Sub-county covers an area of 9,390.3 km². It borders the Republic of Ethiopia to the North, Chalbi District to the South West and Wajir North District to the Southeast. It lies between latitude 02°11' North and 02°04' North and longitude 38°16' East and 39°21' East.



Figure 2: map showing Marsabit County

4.3 Topography, Geology & Soils

Marsabit County generally lies in four main ecological zones: The Ecological Zone II (Forest Zone, Sub-Humid) is characterized by high rainfall amounts of up to 1000mm per annum, low evapo-transpiration and high suitability for agricultural activities. The soils are suitable for agricultural production. The zone includes parts of Mt. Marsabit above 1500m and Mt. Kulal above 1700m which supports dense evergreen forests. It's an important water catchment area covering an area of just about one percent of the county. The Ecological Zone IV (Woodland, Semi-Arid) is semi-arid with medium potential. The zone has become an area of sedentarized agro-pastoral activities. It constitutes the lower slopes of Mt Marsabit, the middle slopes of Mt Kulal and the top of Huri hills. Also included are areas of Sololo and Moyale. The Ecological Zone V (Bushland – Arid) includes the lower slopes of volcanic and basement piles lying between 700 and 1000m. The soils are shallow and stony with rock outcrops as well as clay loams. The flatter areas are covered by grass. The zone consists of the plains of Dida Galgallo, Bure Dera, Milgis

and parts of the slope of Mt Marsabit and Huri hills. These areas are characterized by steeper slopes which may favor greater surface runoff and hence may experience greater sheet wash erosion. The Ecological Zone VI (Dwarf Scrubland, Very Arid) is the most extensive zone in the county. The typical vegetation is dwarf-shrub grassland or a very dry form of bushed grassland. In the very dry areas it may be properly termed as "bushed stone land". It includes all the hills and plains below 700m. Grazing season in these areas is extremely short, lasting not more than two months after the rains. When the rain fails, the only vegetation available in this area is dwarf-shrub which supports goats and camel but not cattle. There are varied geological soil forms, texture and moisture holding capacity, salinity and fertility. This variation in soils means that saline soils are barren while others support vegetation ranging from grass and bush land to evergreen tropical mountain forests.

The soils in Moyale Sub-county can be divided into two major categories. These are the black cotton soils and the rocky stony lava soils. The Sololo-Moyale escarpments mainly consist of black cotton soils which are rich in organic and inorganic materials and have alluvial accumulations which are ideal for crops like maize, millet, fruits and vegetables. The rest of the district consists of rocky and stony lava plains which cannot support agricultural production. These areas have scattered shrubs and bushes which are suitable for livestock especially sheep, goats and camels

3.4 Climatic Conditions

The project area is generally hot with temperatures varying from 20⁰C to 36⁰C. The project area is fairly hot between September and March, while the months of June to July have the lowest temperatures averaging 24⁰C. Moyale and Sololo towns are the wettest points in the district, these areas receive much rains due to proximity to the Ethiopian Highlands.

This low rainfall in most of the parts of the sub-county coupled with high vapour-transpiration rates reduces crop productivity thus making the sub-county vulnerable to drought leading to reliance on relief food throughout the year. However, high potential areas like Moyale-Sololo escarpment receive about 700mm of rainfall. This is sufficient to support appropriate agricultural activities in the respective areas. On average rainfall is less than 50mm and is unreliable making Moyale sub-county one of the dry regions in Kenya.

The sub-county has inadequate water for domestic, livestock, crop and industrial use. The rainfall is inadequate and unreliable. The ground water resources are low and saline because of the basement rock systems. The degree of salinity ranges from low to high depending on the rock type. Where the rocks are deeply weathered, the ground water tends to be more saline. This has greatly affected agricultural and livestock production since most farmers depends on the rains for production. The majority of the populations depend on surface and sub-surface dams for water, which often do not hold sufficient water due to high evaporation rates during the dry seasons.

The project area has harsh climatic condition with low rainfall patterns, high temperatures and sporadic prolonged droughts only favorable for camel and goat rearing. The communities are mainly nomadic and sedentary pastoralists, keeping camels, cattle, goats and sheep both for milk and meat which are their main sources of livelihood.

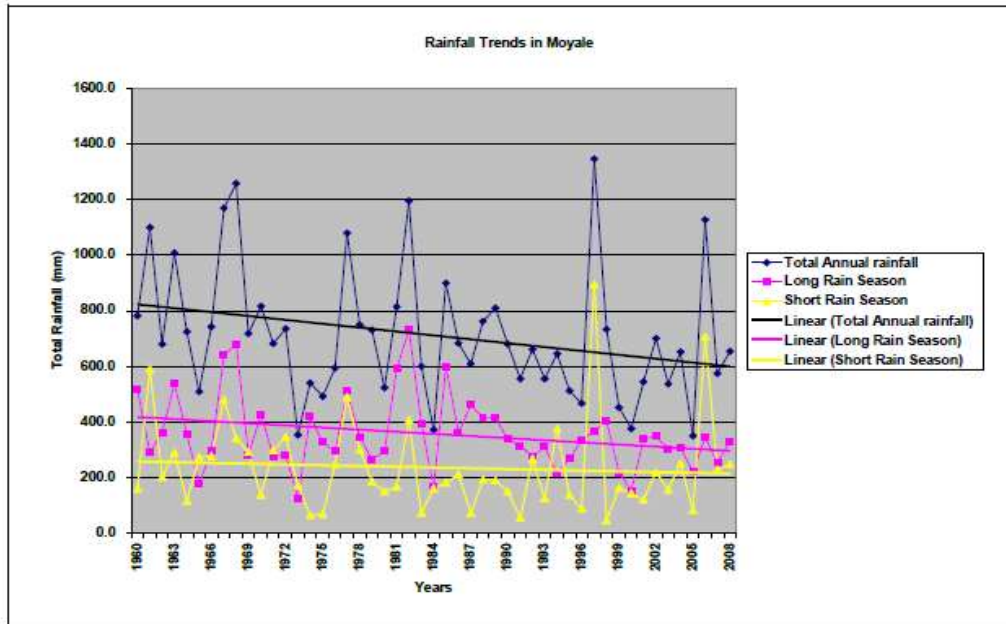


Figure 3: source Kenya Meteorological Department

3.3 Administrative and Political Units

3.3.1 Administrative Sub-Divisions

Administratively, the county is divided into four sub counties namely: Marsabit Central, Laisamis, North Horr, and Moyale. Sub-counties are further divided into 20 wards and administrative villages.

3.3.2 Political Units

The county has four constituencies namely: Saku Constituency which covers the entire Marsabit Central sub-counties, Laisamis Constituency which covers Marsabit South (Laisamis) and Loiyangalani sub-counties, North Horr Constituency consisting of North Horr and Marsabit North (Chalbi) sub-counties and Moyale Constituency covers Moyale and Sololo sub-counties. Moyale Constituency has seven county assembly wards, which is the largest in the county due to its large population while Saku has the least. The county had a total number of 144,131 eligible voters which represents 45.6 per cent of the county 's population in 2012. The total number of registered voters in the county was 104,408 in 2012 representing 72.4 per cent of the eligible voters.

3.4 Social Economic Factors

3.4.1 Population Livelihood, and Poverty

According to the **2019 census**, the county has a **population** of 459,785. This comprised of 243,548 males and 216,219 females and 18 intersex persons. The population is quite youthful with 46.7 percent of the population below age 15 and has therefore a high dependency ratio. There are 77,495 households with an average household size of 5.8 persons per household and a population density 6 people per square kilometre

Poverty incidence is particularly high, at 56% of the County population (KIHBS 2005/2006). The region has been food insecure and majority of the population have perpetually depended on food aid to meet their nutrition need. The segment of population mostly affected by poverty include the women, youth, disabled, the sick especially HIV/AIDS victims, minority and marginalized groups and vulnerable group such as orphaned children.

The livestock population in the project just like other parts of Moyale sub-county is characterized by seasonal migrations along the cross border of Moyale-Sololo escarpment in search of water and pasture. This is due to frequent drought and unreliable rainfall pattern aggravated by climate change. The table below shows livestock population in the broader Moyale-Sub-County where the project area falls.

No	Livestock Species	Total Number in Moyale Sub-county
1	Cattle	73,160
2	Camels	185,045
3	Sheep	1,876,500
4	Goats	906,468
5	Donkeys	30,800
6	Poultry	19,550

Figure 4: Source: Department of Livestock Production, County Government of Marsabit, 2016

3.6 Infrastructure and Access

3.6.1 Road and Airstrips

The total road network in the county is 2,431 Km which consist of 397 Km gravel surface and 2,034 Km earth surface. Most of the roads are however impassable during rainy seasons. The county has no single tarmac road but the construction of Merille-Moyale road is underway and Marsabit –Turbi and Turbi- Moyale phases already in progress.

The county has five airstrips located at Marsabit, North Horr, Sololo, Turbi and Moyale. The Marsabit airstrip is undergoing renovation but the others are in good condition and in use. There is no rail line, port or jetty in the county.

3.6.2 Posts and Telecommunication

The county has two post offices located in Marsabit and Moyale towns. There are 557 landline connections while the mobile phone coverage is 20 per cent. However mobile coverage is only confined in a few urban centres. All major towns have television services and the whole county has radio signals.

3.6.3 Financial Institutions

There are four banks in the county and one Micro Finance Institutions (MFI). The banks are based in Marsabit and Moyale towns. These are Kenya Commercial Bank, Equity Bank, Co-operative Bank and First Community Bank while Kenya Women Finance Trust is the only MFI. The county has only one SACCO situated at Marsabit which only serves teachers.

3.6.4 Education Institutions

There are 277 Early Childhood Development (ECD) centers, 209 primary schools, 31 secondary schools and 4 youth polytechnics in the county. There are however no commercial or public colleges and universities in the county. The proportion of primary schools that are situated within a radius of less than one kilometre from the community is 79 per cent, less than five kilometres is 7.7 per cent while more than five kilometres is 84.4 per cent. This implies that majority of schools are located at distances that are more than five kilometres posing a challenge of accessibility to educational facilities. The number of teachers currently providing basic education in Marsabit county is 1,912, consisting of 492 ECDE teachers, 1,147 primary and 283 secondary school teachers.

3.6.5 Energy Access

Main source of energy is fire wood while the electricity coverage is only found in urban centres of Marsabit and Moyale towns. The county is not served by electricity from the national grid but by diesel generator and a small wind plant to supplement it. Moyale town is connected with electricity from Ethiopia and plans are at an advanced stage to connect Sololo and neighbouring market from the same grid.

The total numbers of households with electricity connection are 1,273. The proportion of households using firewood as main source of cooking fuel is 92.6 per cent, charcoal is 5.6 per cent, paraffin is 1.4 per cent, and biomass residue is 0.2 per cent.

Household using firewood for lighting comprises 57.2 per cent, paraffin 27.5 per cent and those using electricity stands at 3.6 per cent.

3.6.6 Markets and Urban Centres

Main traded goods in the urban centres and local markets are: livestock, fruits, vegetables, maize, beans, wheat, teff and millets. Majority of maize and beans come from other counties whereas some fruits and vegetables come from Ethiopia through Moyale, which is the border town.

3.6.7 Housing

The proportion of household living in mud/wood walled houses stand at 34.2 per cent. Mud/cement 5.7 per cent, wood only 5.7 per cent, corrugated iron sheets 0.5 per cent, grass straw 22.8 per cent, tin 0.5 per cent and others 26 per cent. The proportion of households with cement

floored houses is 8.3 per cent, those with tiles accounts for 0.4 per cent while earth floor is the majority at 91.3 per cent. The household with roofing materials as corrugated iron sheets are 31 per cent, tiles 0.1 per cent, concrete 1.1 per cent, grass 37.5 per cent, Makuti 1.3 per cent and others comprises of 29 per cent.

3.7 Land and Land Use

3.7.1 Mean Holding Size

Most of the land in the county is owned communally except few adjudication sections in Saku constituency. The mean holding size of adjudicated sections is 0.8 Ha but plans are underway to adjudicate land in Moyale constituency.

3.7.2 Percentage of Land with Title Deeds

Less than one per cent of land is registered in the county. Among the registered sections are those in the mountains, Marsabit Township and Dakabaricha in Saku Constituency, where 1,200 title deeds have been issued.

3.7.3 Incidences of Landlessness

Landlessness is not a common issue in the county as people generally reside on communal land. Due to frequent conflict, communities get displaced but normally resume to their land after the situation calms.

3.7.4 Rural Developments

Agriculture and rural development contribute to approximately 60 % of the county 's economy. It employs 70% of the rural population with food security and poverty being major development challenges. Over 65% of the population is food secure with an average poverty levels estimated at 68%. The subsector attracts NGO's, CBO's, FBO's and self-help groups. Prolonged drought, poor infrastructure, insecurity, environmental degradation and underdeveloped markets inhibit the success of rural development initiatives.

3.8 Health

There is a total of 111 health facilities, hospital beds in the county. County has 457 health personnel of different cadre. HIV prevalence is at 1% below the national 5.3% (Kenya HIV Estimates 2011)

3.9 Environment, Water and Sanitation.

Key environmental issues in the entire County include: erratic and poorly distributed rainfall and frequent rainfall failure leading to recurrent droughts. Overstocking by the pastoral communities' results in rangeland degradation through compaction, soil pulverization and soil erosion. Other environmental issues in the County include forest and woodland degradation, poor sanitation, solid waste pollution and loss of biodiversity. Moyale town is served by one dumpsite, however the County contracted solid waste handler regularly collects waste at the project site. Wild birds such as ostriches, guinea fowls, smaller flamingoes, humming birds and several others use the flood plain as their foraging grounds as it is an areas of high productivity and more efficient nutrient cycles. Disadvantages associated with flood plain areas include emergency of diseases such as typhoid, malaria, cholera, amoebic dysentery and bilharzias. Besides, several people may be displaced by floods and turned into internal refugees. Other environmental risks associated

with flooding include damage to water and sanitation facilities, damage to health facilities leading to disruption of the delivery of quality health care services. Siltation of dams and pans along the project area during the flooding season show that siltation is an expensive problem than can be shown. Disruption of road communication during flooding events result in increased cost of living.

There is no sewerage system for larger project area, and most households; 88.24% use pit latrines (CIDP 2016), while facilities such as hotels, lounges and other modern developments use septic systems for onsite waste water treatment. The average distance to a water point in Moyale sub-county is 2km; this is after heavy investment on water infrastructure development by the county government through county allocation fund and other non-governmental organizations. The number of households connected to piped water in Moyale town is 900HHs with 40% access to safe drinking water in the entire sub-county (source; Moyale water office).

CHAPTER FIVE: PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATION

5.1 Introduction

The welfare of societies and the quality of life is directly linked to the sustainable use of our natural resources. This has been duly recognized in Agenda 21, where it is stated that: "Special attention should be paid to the demand for natural resources generated by unsustainable consumption and to the efficient use of those resources consistent with the goal of minimizing depletion and reducing pollution."

Public participation and stakeholder's consultation is a very important aspect of the CPR process and community development. Public participation helps seek the views of the stakeholders/ public on the expected positive and negative impacts and ways of mitigating these issues. It also helps to bring out the contentious issues and gives a chance to those who may be affected by the proposed sub-project to give their views. This report has provided a comprehensive list of those consulted in Annex 3.

The Kenya government has enshrined the need for public involvement in sub-project development in the Constitution of 2010. This has been set out in the *EMCA, CAP 387 and Environmental (Impact and Audit) Regulations, 2003*.

The purpose of the meetings with the interested and affected parties (IAP) was to explain to them about the sub-project and its effects and to receive their oral or written comments. The public participation and stakeholder's consultation helped to disclose all the components of the project to the community and be able understand what the project meant in terms of benefit and any adverse effect.

5.2 Objectives

The main objectives of the public consultation process were to:

- Inform the public of the details of the proposed Project construction;
- Collect views on the positive and negative impacts anticipated by the local residents and how these can be overcome; and
- Build community consensus and acceptance of the proposed project.

5.3 Methodology

Public participation for the proposed Funan-Idha Earth Dam construction project was conducted through the admission of questionnaires to allow for systematic understanding and interaction of the Potentially Affected Persons (PAP's) and the Client.

Over ten (20) questionnaires were issued to relevant stakeholders of the proposed development. A sample of these questionnaires has been attached to the report for ease of reference.

A second stage whose findings are incorporated into this report involved holding of stakeholders public Baraza on site. During the Baraza, stakeholders had a chance to interact with the proponent represented by the Lead expert and design Engineers. (See attendance list Annexes-annex 3)

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.

Public participation and consultations comprising of local administration leader's area chief and MCA and ward administrators, community opinion leaders, youth's representatives, and VMGs; Minutes of Meeting Held at Walda Location on the 18th March, 2021 During Public Participation, Attendance List and filled in questionnaires, as well as photos were obtained. A total of 15 questionnaires were administered and all were filled and returned. Due to observation of Covid protocols a total number of 20 participants who include key community opinion leaders encompassing of 17 males and 3 Females participated in the community public sensitization forum.

It has been demonstrated successfully that sub-projects that undergo public participation will acquire a high level of acceptance and accrue benefits to a wider section of society.

Summary of Key Environmental and Social issues highlighted during public and stakeholder's consultations;

No	Impact	Mitigation Measures
1	Catchment erosion and siltation of the dam	On-farm construction of terraces for farmers near farms to control soil erosion
2	Dust and air pollution	Catchment conservation and protection of livestock and Waterways
3	Loss of some biodiversity	
4	Increased waterborne diseases	Training on water treatment for community members Community to be enlightened on use of toilets and chief to follow on the use of the same.
5	Community conflicts	Train water management committee on conflict resolutions
6	Drowning	Fencing the dam
7	Overgrazing	Encourage on farm water drinking through zero grazing
8	Mosquito increase	Using nets to control mosquitos
9	Increase of disease vector due to concentration of livestock	Disease surveillance and quarantine during outbreaks
10	Water Pollution	Proper waste disposal during construction and adequate instructions to operators on waste disposal Training on proper disposal of chemicals through the safe use of pesticides
11	Accidents from construction	Close supervision by qualified personnel
12	Substandard works leading to collapse of pan	The management committee and resident engineer to guide through the construction
13	Spread of sexually transmitted diseases	Sensitization on the control of HIV/AIDs and other STDs
14	Spread of COVID19	Adhere to the Public health act; 242 legal notice 54 of April 2020, on COVID 19 regulations thorough provision of social distancing and wearing PPEs

All community members including vulnerable groups i.e. the youth, women and persons with disability were involved in making decisions.

CHAPTER SIX: ANTICIPATED IMPACTS AND MITIGATION MEASURES

This chapter presents forth the identified potential impacts of the proposed earth dam construction, assessment findings and proposes appropriate mitigation measures. The benefits of small dams/reservoirs can be obvious and impressive but the adverse environmental effects can be significant, long-term, and perhaps permanent.

6.1 Impacts during the construction/construction phase

During the construction phase, the following operations and processes are likely to result into significant impacts: biodiversity loss; excavation; movement of machinery; water and energy resource-use and solid and liquid waste management.

6.1.1 Biodiversity loss

Assessment

Vegetation at the proposed site consists mainly of short grasses. There is a rich diversity of fauna mainly arthropods whose life is depended on the water that is at the proposed dam site for shelter and food. Most of the plants must be cleared during excavation to pave way for construction works. With the removal of flora and fauna, several species of plants and animals will be threatened with local-scale extinction and/or displacement. Habitats of these animals will be altered or destroyed by the di-siltation process. Loss of vegetation from the site also means loss of valuable food for these animals leading to eventual death and/or displacement. Moving vehicles, machines and people used for the work will create additional damage to vegetation. Pressure will be exerted on the plants by the heavy vehicles, machines and people and this pressure may interfere with biological processes in the plants alongside leading to death of the plants.

Mitigation

It is impossible to totally avoid plant and animal removal and disturbance during the construction phase. It is however important to ensure that any removal and/or disturbance is restricted to particular areas to avoid spill-over effects to other areas and that the same areas are restored later by:

- a) Ensuring proper demarcation of the project area to be affected by the construction works.
- b) Strictly controlling storage of construction materials over designated areas to minimize destruction of vegetation.
- c) Re-establishing vegetation (ornamental plants and hedges) in whole or part of the disturbed areas through implementation of a well-designed landscaping programme. Part of the topsoil excavated from the site can be re-spread in areas to be landscaped to enhance plant health.
- d) Ensure clearing of vegetation is restricted to only marked areas
- e) If native fauna species are discovered contact wild life department for further instructions
- f) Any unexpected finds of potential archaeological significance shall be reported to the Kenya National Museum, and construction works will be ceased until permission is granted to proceed

6.1.2 Soil erosion

Assessment Findings

Mobilization of heavy machinery to site for earth movement and leveling will cause instability of the soil in the area and as a result cause soil erosion mainly of top soil. During operation of heavy machinery for earth movement and leveling, soil in the area will be disturbed and as a result cause soil erosion mainly of top soil. Consequently, this may lead to siltation and sedimentation of rivers/reservoirs in the Catchment if not controlled.

Mitigation Measures

Soil erosion mainly of top soil may lead to sedimentation of reservoir if not checked could reduce the storage capacity of the dam. To avoid this, the proponent needs to;

- i. Ensure a buffer zone is created between the water front and occupied areas of human settlement and agricultural activities.
- ii. Avoid unnecessary clearing of the vegetation
- iii. Limit use of heavy machinery to designated areas
- iv. Construct heavily disturbed areas
- v. Install silt fences, sandbags and/or hay bales where required down gradient of disturbed areas, base of embankments, existing drainage lines, earthworks and stockpiles
- vi. Plant indigenous trees 2-3m apart around the dam to stabilize the sides/banks within the shortest time possible after completion of construction works
- vii. Heavy plant and vehicle movements will be restricted to hard surfaces after significant rain events
- viii. Conduct daily inspection of erosion & sedimentation control measures including after rainfall.

6.1.3 Hazardous waste management

Assessment Findings

Use of machinery which is not well maintained or serviced may lead to leakages thus polluting soils and consequently water resources.

Mitigation Measures

Not well maintained or serviced machinery usage may lead to leakages thus polluting soils and consequently water resources. To minimize this;

- i. Ensure all machinery and equipment is regularly maintained
- ii. No vehicle maintenance, and non-operational/routine plant or equipment maintenance, will be conducted on-site
- iii. Dispose any used oil at a designated place in accordance with the law
- iv. Keep an inventory of oil spills during road construction period
- v. Monitor water sources in close proximity dam for oil spills once every month

6.1.4 Land dereliction

Assessment Findings

Since the dam to be constructed is an embankment dam, gravel may be obtained within the project area for the embankment. Barrow pits may also lead to instability of the soil in the area and as a result cause soil erosion mainly of top soil. Borrow pits may lead to limited loss of some wildlife habitat for small fauna and flora. As a result, loss of vegetation due to land clearance, land degradation due to excavation works and dust are expected.

Mitigation Measures

No historical or cultural sites are expected to be lost. However, agricultural land will be affected though relatively of low significance. Mitigation measures will include;

- i. Construction of affected areas through reforestation
- ii. Restrict movement of vehicles and equipment to designated areas
- iii. Restrict clearance of vegetation to critical areas
- iv. Remove all stockpiles and overburden
- v. Stabilize all slopes and unstable areas.
- vi. Maintain drainage at the dam site

6.1.5 Embankment wall

Assessment Findings

The proposed earth dam has a dam wall height of 4m. No households are expected to be relocated due to inundation resulting from dam and spillway construction. No mitigation is required for loss of historical and cultural sites since none are located within the impoundment area. The project area has been subjected to years of human agricultural activities and as such not much wildlife habitat, flora and fauna is left. Therefore, this impact will be low.

Mitigation Measures

Measures to be put in place include;

- i. Limit clearance of vegetation only to critical areas
- ii. Conduct awareness campaigns among staff and community on the need to conserve nature
- iii. Adopt strict good conservation practices

6.2 Impacts crosscutting construction and operation

There are some impacts that will cross cut construction and operation phases of the proposed dam project. They are discussed as follows.

6.2.1 Waste management

Assessment Findings

During the construction and operation stage solid waste is expected resulting from land clearance and leveling and excavation. However much of the earth and rubble will still be used in the erection of the dam wall. In addition, human activity involving workers will also result into waste being generated. Water pollution due to indiscriminate disposal of waste may lead to water borne diseases.

Mitigation Measures

Solid waste in form of rubble and litter is expected during construction. The proponent should ensure that;

- i. Waste should be collected at selected points for proper disposal at a designated area
- ii. Some of the rubble should be used for compaction in the construction of the dam wall
- iii. Encourage the community to have their own household pit latrines
- iv. Conduct awareness campaigns among the staff and the community
- v. Discourage open air incineration of solid wastes;
- vi. Put in place an efficient waste management system that will prevent the accumulation of uncontrolled wastes, as well as an efficient collection system and off-site disposal; and
- vii. Ensure the collection and disposal of the wastes is done regularly and appropriately
- viii. Put in place an efficient waste management system that will prevent the accumulation of uncontrolled wastes, as well as an efficient collection system and off-site disposal

6.2.2 Creation of habitats for disease vectors

Assessment Findings

The most common vector disease within the proposed project site is Malaria. Construction of the proposed dam will create conducive habitats for disease carriers such as mosquitoes and snails responsible for spreading diseases such as malaria and schistosomiasis (bilharzia).

Mitigation Measures

Assess ecology of disease carriers in the project area, and employ suitable prevention and mitigation measures, e.g.:

- i. Monitor the presence of disease vectors
- ii. Install a spillway to ensures continuous flows, hence reduced likelihood of creation of habitats for bilharziasis is remote
- iii. Encourage people in the vicinity of the proposed site to use mosquito nets

6.2.3 Change in stream flow regime, morphological features and water quality

Assessment Findings

Construction of the proposed dam may affect variations in discharges and water levels. The discharge regime may become more regular compared to the conditions without dam and both low and high discharges may occur less frequently. Hydrological changes in the river system may lead to greater area of influenced both upstream and downstream. The stream morphological features may also change with time. During construction, waste in form of rubble and other forms may cause pollution to water quality that can affect downstream users. Therefore, construction of the proposed dam (reservoir) implies creation of a new environment, developing its own typical water quality problems that may affect the downstream section to some extent.

Mitigation Measures

To mitigate changes in stream flow regime, morphological features and water quality, the proponents may consider the following mitigation options;

- i. Ensure that the design has adequate design provisions to allow flow downstream even in times of dry months.
- ii. Apply standard dam operational rules
- iii. Observe water right permit regulations and requirements for the sake of downstream users
- iv. Avoid discharge of any waste effluent into the dam
- v. Conduct awareness on invasive alien's aquatic weeds

6.2.4 Socio-economic and cultural Assessment Findings

Construction and operation of a dam will create opportunities for jobs mainly for the local communities. At preparatory and construction stage, local people will be engaged and consequently livelihood for family members will be guaranteed. During the construction, skilled personnel will add on to the local population. There is also a possibility that the community will receive an influx of laborers looking for employment which will further add on to the local population. The operation of the dam may result in increased economic activity in the area consequently more people will be attracted to the area. This may expose the community to foreign people who may lead to the spread of HIV/AIDS and other STIs.

Mitigation Measures

The will consider the following mitigation measures;

- i. Take a precautionary measure i.e. should any effect of historical nature be discovered during construction; relevant authorities will be notified immediately.
- ii. Local people should be given priority for employment particularly as casual laborers
- iii. Ensure adequate facilities are provided for staff such as sanitation facilities
- iv. Promote formation of small holder schemes to be run by small scale farmers within the community
- v. Sensitize staff and community on the dangers of HIV/AIDS and STIs

6.2.5 Impacts related to occupational health and safety

Assessment

There are three main types of occupational health and safety hazards that may be of concern in any proposed development namely physical, chemical and biological. Potential physical hazards at the proposed development during the construction and operational phases will ordinarily include noise and accidents among others. Chemical hazards will involve exposure to hazardous materials either by inhalation, ingestion or by skin contact. Biological hazards involve exposure to pathogenic organisms, which may cause diseases. Other impacts related to occupational health and safety include environmental pollution, congestion and poor sanitation. Environmental pollutants may result from poor disposal of wastes; frequent overflows from latrines and improperly placed dumping sites. Accidental cuts, pricks and bruises are common among construction workers as a result of the use of machinery and hand tools.

Mitigation to occupational health and safety impacts

Below are mitigation measures to the occupational health and safety impacts.

- a) Taking precautions: Every person at the proposed spring site should take precaution not to cause any effect on his/ her own health or to the health of any other person.
- b) Border fencing: The site should be fenced to control access through a centralized gate.
- c) Provision of personal protective equipment to workers: PPE include: masks, goggles, scarfs, footwear especially boots and overalls among other protective clothing as spelt out under section 101 (1) of OSHA, 2007. Protective clothing must be worn in all situations where the body and skin are potentially exposed to hazards such as chemicals, harmful dusts, sharp objects, burns and extreme temperature or are working in areas that present threatening experiences.
- d) Provision of first aid facilities and services: Ensure there is a fully equipped first aid kit at the site during construction. A typical first aid kit contains a first aid manual and is equipped with sterile adhesive bandages, safety pins, cleansing agent/soap, latex gloves; sterile gauze pads triangular bandages, non-prescription drugs, scissors, tweezers and antiseptic amongst others.
- e) General employee welfare: Employee welfare issues include free medical attendance if injured on work. The contractor should also have provisions for sick leaves and offs for employees

6.3 Impacts during operation

During the operation the following impacts may arise: change in flow regime, morphological features and water quality; change in ground water quality; water resource-use and risk of flooding and embracement failure.

6.3.1 Change in groundwater level and quality

Assessment Findings

Groundwater levels are liable to be impacted by the creation of an impoundment. Raised water levels upstream may result in a localized change to the water table. These changes to water levels may impact on groundwater upstream and downstream, resulting in water logging of soils or wells, and changes to catchments Infiltration. Since impoundment of a stream may lead to increased percolation of water to deeper levels, the percolating water if contaminated may lead to groundwater quality deterioration depending on soil type and condition.

Mitigation Measures

Impoundment may increase or decrease (dilution) the pollutant load of receiving waters while withdraws may indirectly lead to an increase of the pollutant loads affecting water quality. Measures will include;

- i. Impounding the unnamed stream to promoting percolation of water to deeper levels
- ii. Ensure that the dam is constructed to standard design ensuring that there is no dam wall seepage thus minimizing losses while increasing retention time for percolation
- iii. Regulate use of agro chemicals to maintain water quality in the reservoir
- iv. Use only authorized agro-chemicals

6.3.2 Risk of dam failure

Assessment findings

Floods are a major cause of dam failure and therefore monitoring the dam during high water level conditions is critical. However, failure may also occur during normal conditions, and this failure tends to be the most dangerous because the resulting flood would be sudden. Indicators of a potential dam failure which include;

- i. Settlement or cracking in the embankment.
- ii. New sinkhole in reservoir area or on embankment
- iii. Sudden or rapidly proceeding slides of the embankment slope
- iv. Excessive erosion on the embankment, below the spillway, or at the abutments.
- v. Excessive seepage or cloudy seepage through the abutments or embankments.
- vi. Overtopping flow eroding the embankment slope
- vii. Damage to dam or appurtenances that has resulted in uncontrolled water release

Mitigation measures

The proponent may consider the following measures;

- i. Open principal spillway gate to lower the reservoir level as rapidly as possible to a non-erosive velocity. If the gate is damaged or blocked, pumping or siphoning will be employed instead
- ii. Prevent vehicles and equipment from driving between the seepage exit points and the embankment to avoid potential loss from the collapse of an underground void.
- iii. Construct sandbag or other types of ring dikes around the seepage exit areas to retain a pool of water, providing backpressure and reducing the erosive nature of the seepage.
- iv. Place sandbags along the low areas of the top of the dam to reduce the likelihood of overtopping and to safely direct more water through the spillway.

6.3.2 Water quality management

Assessment

The rainwater runoff which will fill the reservoir flows over ground that is usually contaminated. The ground on catchment areas can have animal droppings, human excreta (especially from young children) and other rubbish on it that will pollute the water. While this water is suitable for livestock domestic use. However, water processing and purification shall be required for safe for drinking. Reservoirs need to be maintained in a hygienic state to assure quality of the water. Silt, leaves, dead animals and other things can collect in the in the water and result in contamination. Spring water should be tested before and after heavy rains each year for bacteria. If water levels change frequently when it rains, the water may be very susceptible to contamination.

Mitigation

To ensure quality of water at the reservoir and particularly at the spring, the proponent needs to;

- a) Carry out bacterial tests and other tests before and after heavy rains each year to detect presence of bacteria, giardia, cryptosporidium and other microorganisms, pH, turbidity, and conductivity to determine if surface-water contamination is a problem.
- b) Put a wire screen on the pipe leading into the spring box to prevent unsafe things from entering pipes. This screen will be cleaned every now and again to ensure a steady flow of water.

- c) Disinfect the spring water with chlorine

6.3.3 Conflicting water use demands

Assessment

During assessment there were no conflicting water demands within the proposed project area. Within the proposed project areas, many households are relying on protected natural spring water sources because of they are reliable and affordable. Most households at the proposed project site use water for domestic purposes and watering of animals.

Mitigation

To prevent problems associated with conflicting water demands, the following mitigation measures can be applied;

- i. Ensure other water uses such as livestock water supply from the reservoir do not conflict with existing human, livestock, wildlife or aquatic water uses
- ii. Ensure withdrawals are reliable from reservoir especially during dry seasons
- iii. Encourage planting of crops/trees with lower water demands within the dam catchment
- iv. Ensure effective community organization for equitable access to the proposed dam

6.3.4 Spring water contamination

Assessment

During assessment, there were no reports/complaints of contamination of the water by the beneficiaries. Pathogenic contamination will be unlikely because the soil type and its thickness permit the required velocity of infiltration of the surface water to allow for natural filtration and biological action to remove pathogenic organisms before the water enters the aquifer feeding the spring. Waste water treatment plant and pit latrines are located away from the proposed spring site. However, crop farming activities on the slopes surrounding the proposed spring will permit poorly drained storm water into the proposed site exposing the spring to agro-chemical contamination.

Mitigation

To minimize the impacts associated with contamination of the spring and dam water, the developer can consider applying the following measures:

- i. Encourage integrated pest management within the dam catchment
- ii. Embrace organic agriculture within the dam catchment
- iii. Regularly conduct water quality analysis to ascertain quality of the water from the spring
- iv. Integrate on-site disinfection/chlorination of the spring water
- v. Fence the site to prevent intrusion by animals
- vi. Avoid locating latrines and other waste water treatment systems in the immediate upstream of the proposed reservoir
- vii. Ensure plants planted upstream that do not interfere with the water quality of the at the dam and the spring
- viii. Discourage washing activities within the proposed dam site

ix. Provide alternative facilities for washing and watering of animals.

6.3.5 Risk of flooding/back flow

Assessment

The proposed dam has never experienced flooding during heavy rains. Flooding can occur during heavy rains which may in turn result in damage to the embankment and downstream of the dam. Backflow waters may temporarily interrupt with activities upstream of the reservoir. Back flow and flooding risk can occur due to poor spillway construction and poor design of storm water drainage.

Mitigation

Back flow and flooding risks can be mitigated by the following measures at the proposed site;

- i. Avoid spring tapping at sites that may be prone to flooding/back flows
- ii. Design the spring to prevent backflow of water from outlets
- iii. Keep the spillways clear of obstacles
- iv. Appropriately manage storm water at the proposed site.
- v. Provide alternative facilities for washing and watering of animals

6.3.6 Drowning of livestock and children

Assessment findings

During the public consultation process respondents expressed fears in drowning incidents of children and livestock that they foresaw with the implementation of the project. However, the project design includes a silt-trap and live fencing which will take care of these fears effectively. The proponent also plans to protect a water source for drinking water outside the main reservoir area. The study revealed that households within the project site had not experienced incidences of drowning for humans or livestock

Mitigation

The proponent should consider the following mitigation measures;

- i. Undertake education and awareness of the local communities and making them aware of the hazards related to unrestricted entry into the dam reservoir.
- ii. Fence the reservoir area, erect warning signs and control access of the dam while efforts should be put on teaching local people proper safety behavior and swimming.
- iii. Construct water drinking points for the local communities as a strategy and a way for reducing increased access to the dam reservoir to get water which causes incidents.

6.3.7 Record keeping, documentation and environmental policy

In accordance with the EMCA (1999), records of environmental issues and operational licenses and permits need to be kept and available to the Authority when necessary to prove compliance. These include waste disposal permits, accident registers and a list of all hazardous materials on site. In addition, inspection records; training records; waste disposal records; discharge-monitoring reports and local authority licenses amongst others are to be documented and kept safely. For

efficient management of the proposed project; to facilitate further assessments and to comply with the law, it is recommended that the following records be kept always in addition to those mentioned above:

- a) Training records in environmental issues and periodic review notes;
- b) Records of violations and notification of authorities' correspondence in relation to the environment; and
- c) Situational reports made to NEMA in accordance with Section 68(3) of the EMCA 1999.

6.4 Decommissioning phase

Assessment findings

The proposed reservoirs may be decommissioned when it no longer serves the purpose for which it was constructed. After significantly deterioration, the costs of repair may exceed the expected benefits, and dam removal may be a less expensive alternative.

Mitigation

- i. Decommission the reservoir in phases (continued operation, partial reservoir removal, and full reservoir removal).
- ii. Determine the reservoir sediment characteristics including volume, spatial distribution, particle-size distribution, unit weight, and chemical composition.
- iii. Establish an inventory of the existing infrastructure around the reservoir, along the downstream river channel, influenced by the reservoir.

CHAPTER SEVEN: ANALYSIS OF PROPOSED PROJECT ALTERNATIVES

This section evaluates feasible alternatives to the proposed project. The underlying principle involved in identifying alternative option(s) to a proposed development is to ensure that the option chosen, which indeed may be the ‘non-development/no-action’ or ‘relocation’ or alternative land-use’ option would result in optimal social, environmental and capital benefits. In effect the option chosen should bode well not only for the developer, but also for the environment and stakeholders in the area. Feasible land-use options are compared in terms of lowest costs and most benefits criteria: environmental impacts, social acceptability, economics (including productivity of land-use) and design feasibility.

7.1 “No-action” alternative

The selection of the “No-action” alternative would mean the discontinuation of the proposed dam construction project. Thus, the site is retained in its existing form. This option is based on the premise that the proposed project will have severe implications to the environment if implemented. The implication is that the site is unlikely to undergo any major changes from its present condition while biologically; the vegetation present at the site will not be affected.

7.1.1 Findings

The proposed project is set to assist local community members within its vicinity in terms of enhancing food and water security and will have impacts that can be mitigated if implemented.

7.1.2 Implications of selecting the “No-action” alternative

If this option is selected by the Authority, then:

- a) There would be loss of livelihoods that the project is envisioned to create;
- b) The proponent would be at a loss in terms of financial commitments already made in designing and planning for the project: professional fees to the project managers, land surveyors, EIA lead experts, public health officers and physical planners and application for EIA approval; and
- c) It would discourage the proponent and any other local and international investors from investing in similar projects in the area resulting in a zero development.
- d) The beneficiary community would continue incurring losses due to reliance on the unpredictable and unreliable rain fed agriculture

7.2 Relocation Alternative

This option would mean transfer of the proposed development to another site. It may be based on the criteria that the proposed site is in a zone planned for other developments that are not compatible with the proposed project or the project will be an impediment to future development in the area or it is a hindrance to an existing development or is not compatible with other developments in the area or the site is environmentally sensitive such as: having one or more threatened, rare, endangered, endemic or key stone plant or animal species or any other flora or fauna that is considered for preservation under law or is or is in an archaeological or historical area or is found to have a historically or archaeologically important material. If this option is selected the proponent is required to look for an alternative site either within or outside the zone.

7.2.1 Findings

There are no physical, biological, cultural and socio-economic features of special concern at the site. At the moment, the proponent does not have an alternative site within the same beneficiary community.

7.2.3 Implications

If this option is selected by the authority, then:

- a) As in the ‘no-action’ option, the proponent would be at a loss in terms of financial commitments already made in designing and planning for the project;
- b) It might take a very long time looking for and finding a similar sized land and completing all official transactions relating to change of land ownership;
- c) There is also no guarantee that the land would be available, and if such land is available, its cost might be beyond affordable means for the proponent; and
- d) Even if such land is found its cost might be beyond affordable means for the proponent.
- e) The beneficiary community would be at loss

7.3 Alternative land-uses

The option allows the developer to explore other alternative land uses for the site other than the proposed project. This selection is based on the principle that the proposed development is not compatible with the existing land-uses or as in the ‘no-development’ option, the project has severe implications to the environment if implemented. This option requires application for change or extension of use to allow for the alternative development.

7.3.1 Findings

The products of the proposed project will not have severe implications on the environment if the proposed mitigation measures will be implemented.

7.3.2 Implications

If this option is selected by the authority, then:

- a) Change of use of land might take a long time to mature since it requires relevant authorities to approve the change of land-use;
- b) Any other commercial or industrial land-use may mean user incompatibility with current neighborhood land-uses;
- c) The change might also be massively objected by the inhabitants and/or residents in the proposed project area

By settling on the “relocation” and “alternative land-use” options, the processes of designing and planning will have to be started over again. This means that the proponent will have to undergo an extra expense by: applying again to relevant authorities; re-engaging professionals like project managers, land surveyors, EIA lead experts, public health officers and physical planners and applying for EIA approval and licensing from NEMA at 0.1% of total project cost. In addition, with the changing demand and supply at the market, the prices and availability of materials to be

used may not be promising to the proponent at the time the proposal is finally approved by the authorities.

7.4 The Proposed Development as Described in the CPR Report

The impacts and mitigation measures for this alternative are discussed in detail throughout this report. The positive impacts have also been identified. The Merits of this alternative are as follows:

- a) The property (land) value will appreciate and the investment made in the project will be productive from the optimal economic and spatial land-use.
- b) Visual and aesthetic amenities will be improved.
- c) The community will have a potential source of income through the supply of water during dry season livestock and therefore employment opportunities to be created by the proposed project.
- d) The inhabitants will undertake sustainable livestock farming.

CHAPTER EIGHT: ENVIRONMENTAL AND SOCIAL MANAGEMENT & MONITORING PLAN(ESMMP)

8.1 Environmental management

This section provides a concise structure of actions with specific priority level of action for the management of the environment in all phases of the proposed project. Environmental management is best achieved by preparation and implementation of an Environmental and Social Management and Monitoring Plan (ESMP). As the project commences and scheduling plans are developed and changed, components of the ESMP might require amending. This is therefore a working document, which can be updated whenever new information is received or site conditions change. The ESMP is generally prepared in accordance with rules and requirements of the EMCA, 1999.

8.2 Annual environmental audits

Environmental monitoring and audits will be conducted to establish if the proposed project implementation complies with established environmental management standards. Environmental monitoring and audits will be conducted to ensure that identified potential negative impacts are mitigated. EA will be conducted annually and will be based on the ESMP. EA reports will be submitted to the NEMA.

8.3 Environmental and Social Management & Monitoring Plan

Table: *Environmental and Social Management & Monitoring Plan*

Potential Impact	Mitigation/Enhancement Measures	Responsibility	Monitoring means / Frequency	Verifiable Indicators	Estimated Costs (KShs.)
Construction Phase					
Loss of Flora and Fauna	<ul style="list-style-type: none"> • Cutting of trees should be done only where necessary. • The contractor shall ensure that clearing of vegetation clearing is limited to the dam site • Avoidance of vegetation clearing along riparian land • Sensitization of construction work-force on environmental conservation and ecological Protection 	KCSAP and Contractor	Routine inspections	<ul style="list-style-type: none"> • No. and type of vegetation cleared • Size of area cleared 	50,000
Water Seepage	<ul style="list-style-type: none"> • Excavations should not go beyond the compact zone below which no further seepage/percolation is expected. Rock and soil layers above the compact zone may be weathered and permeable which will necessitate sufficient compaction to minimize seepage. 	Contractor	During operational phase	<ul style="list-style-type: none"> • High Water Retention Capacity 	No Cost

Potential Impact	Mitigation/ Enhancement Measures	Responsibility	Monitoring means / Frequency	Verifiable Indicators	Estimated Costs (KShs.)
	<ul style="list-style-type: none"> • There is need to compact all the identified low resistivity areas to reduce the porosity of the subsurface to enhance water storage, especially at down-slope embankment. The major points to consider are the lineaments and the weathered zones during excavation • Since it is not possible to eliminate seepage with the current embankment material, it is recommended that the pan be lined with a clay blanket up to the spillway level. • Continual maintenance should be instituted for erosion control and any damage which may initiate seepage. 				

Potential Impact	Mitigation/ Enhancement Measures	Responsibility	Monitoring means / Frequency	Verifiable Indicators	Estimated Costs (KShs.)
Noise pollution and vibration	<ul style="list-style-type: none"> • The Project Contractor to use the best available practices on-site to minimize occupational noise levels; Machines with minimal vibrations to be used • The Project Contractor to regularly inspect all construction equipment to ensure they are maintained in good working condition; • The Project Contractor to provide ear muffs for those working with noise producing equipment; • Combine noisy operations so that they occur at the same time. • Equipment Operators to wear PPEs to prevent direct noise from the machinery • Time restrictions for high vibrating machines (avoid working during the night for such machines)/ restricting blasting • The contractor should get noise permits from NEMA before the start of construction phase 	Contractor	During construction	<ul style="list-style-type: none"> • State of machines used • Type of machines used for compaction 	10,000

Potential Impact	Mitigation/ Enhancement Measures	Responsibility	Monitoring means / Frequency	Verifiable Indicators	Estimated Costs (KShs.)
Influx of workers from other areas	<ul style="list-style-type: none"> Ensure preference is given to local residents for skilled and unskilled jobs where necessary. 	Contractor	At least 70% of the laborers are locals	<ul style="list-style-type: none"> Staff registry reports 	-
Encroachment into the Catchment Environment	<ul style="list-style-type: none"> Ensure that no new houses are constructed near the Dam. Ensure that the required amount of water abstracted is observed 	WRA	Regular Monitoring	<ul style="list-style-type: none"> Volume of water flow 	Proponent Cost
Air Quality and Dust Emission i. Gaseous Emission ii. Dust Emissions	<ul style="list-style-type: none"> Dust masks to be used to mitigate against occupational health risks of inhaling exhaust gases and dust Engine maintenance plans to prevent leakages and adverse emissions; Decrease the travelling distance thus reducing emissions from vehicular traffic. Construction vehicles will only use the designated transport routes and stick to prescribed speed limits to avoid dust Proper repair and maintenance of vehicles and equipment to minimize exhaust gases 	Contractor	Regular Monitoring	<ul style="list-style-type: none"> Records of speed limits signs erected Records of machine and vehicle service Evidence of use of dust masks by workers on site 	10,000

Potential Impact	Mitigation/ Enhancement Measures	Responsibility	Monitoring means / Frequency	Verifiable Indicators	Estimated Costs (KShs.)
Workers Accidents and Hazards during Construction	<ul style="list-style-type: none"> Observe Occupational Health and Safety rules and regulations as stipulated in the OHSA, 2007; The Project Contractor will be required to provide appropriate personal protective equipment There should be a crisis management team to administer First Aid to injured persons; The Project Contractor should train workers on how to use various PPE and safe use of machines 	Contractor	Regular Monitoring	<ul style="list-style-type: none"> No of persons injured Type of injury experienced 	20,000
Generation of Liquid and Solid Waste	<ul style="list-style-type: none"> Adequate measures taken on the spilled substance on land since it will affect the subsurface waters. Minimal to no spillage should be encouraged and if it is more, then scooping and adequate dumping done. Faecal waste disposed by use of temporary latrines erected on the site. 	Contractor	Regular Inspection	<ul style="list-style-type: none"> Presence/ absence of scattered solid wastes at sites Availability of waste receptors No. of sensitization meetings held with workers 	30,000 part of the Contractors cost

Potential Impact	Mitigation/ Enhancement Measures	Responsibility	Monitoring means / Frequency	Verifiable Indicators	Estimated Costs (KShs.)
	<ul style="list-style-type: none"> Provision of solid waste collection facilities (waste bins) Sensitization of construction workers on proper disposal of wastes. 				
Socially unacceptable relationships between construction workers and community that may lead to Gender based violence (GBV) and increase in Drug Abuse and HIV/AIDS transmission	<ul style="list-style-type: none"> Awareness creation for both workers and community Establishment of a grievance address mechanism Code of conduct for employees making it clear that sexual relations with underage children, GBV and SEA are not allowed. 	MOA, KCSAP, Contractor and Health Department	Routine monitoring	<ul style="list-style-type: none"> Number of GBV, Drug and substance abuse and HIV/AIDS cases reported 	100,000
Occupation Health and Safety	<ul style="list-style-type: none"> Continuous supervision of occupational, health and safety management to ensure Compliance 	MOA, DOSH, KCSAP	Routine Inspection	<ul style="list-style-type: none"> HSE inspection reports 	100,000 for awareness
	<ul style="list-style-type: none"> Occupational Safety and Health Training for contractor's staff 	Contractor	Throughout construction phase	<ul style="list-style-type: none"> Training reports Training attendance sheets 	50,000 part of contractors cost
	<ul style="list-style-type: none"> Conduct orientation talks and visits 	Contractor	At employment of new staff	<ul style="list-style-type: none"> Orientation report 	5,000

	<ul style="list-style-type: none"> Train all workers on Health Safety and Environment (HSE) including Covid19 safety measures with an aim of improving awareness 		On a need basis	<ul style="list-style-type: none"> No. of trainings on HSE conducted 	10,000
	<ul style="list-style-type: none"> The proponent will erect appropriate safety signage during repair and maintenance activities 		On a need basis	<ul style="list-style-type: none"> No. of Prominently erected safety signage during R&M work 	30,000
	<ul style="list-style-type: none"> The proponent shall provide first- aid facilities for staff 		On a need basis	<ul style="list-style-type: none"> Availability of first-aid kit during R&M work 	10,000
	<ul style="list-style-type: none"> fencing or planting trees around them which will help in avoiding contamination while at the same time minimize likely accidents; 	Contractor	During operation entire	<ul style="list-style-type: none"> No. of accidents reported 	20,000
	<ul style="list-style-type: none"> Conduct toolbox talks (safety meetings) 	Contractor	On a daily basis	<ul style="list-style-type: none"> No. of toolbox talks conducted 	5,000
Physical Cultural Resources	<ul style="list-style-type: none"> Continuous inspection of archeological activities in the area 	Contractor	Routine Inspection	<ul style="list-style-type: none"> Presence of archaeological findings 	10,000
Sub Total Cost for Construction Phase					Kshs590,000
Operation Phase					

Potential Impact	Mitigation/Enhancement Measures	Responsibility	Monitoring means / Frequency	Verifiable Indicators	Estimated Costs (KShs.)
Increase in Waterborne Diseases	<ul style="list-style-type: none"> • Training on efficient home-based irrigation system that is efficient in water use • Removal of any stagnant water • Community members should also be encouraged to use preventive measures such as sleeping under treated mosquito nets; • Use of gumboots in the irrigation field • Ensure new houses are not constructed very near the Dam • The communities should be educated and made aware of such dangers, particularly of waterborne diseases. 	KCSAP / Farmers	On need basis	<ul style="list-style-type: none"> • Number of stagnant waters pools 	100,000

Potential Impact	Mitigation/Enhancement Measures	Responsibility	Monitoring means / Frequency	Verifiable Indicators	Estimated Costs (KShs.)
Poor water quality of the impounded reservoir	<ul style="list-style-type: none"> • Continuous use of the reservoir and regular distillation • Promoting good agricultural practices in the catchment area 	MOA, KCSAP	During operation	<ul style="list-style-type: none"> • Change of water color/ eutrophication • Sediment load 	30,000

<p>Ground Water Pollution and Water Contamination</p>	<ul style="list-style-type: none"> • The community should be trained on safe disposal of faecal waste • The Dam should be constructed in a manner to avoid direct runoff from the upper side of the dam avoid contamination • Soil compaction at the base of the pond line the ponds with high density polyethylene (HDPE) 	<p>WRA / Farmers</p>	<p>During dam compaction and operation</p>	<ul style="list-style-type: none"> • Water quantity loss • Dam water pollution • Direct runoff experience 	<p>20,000</p>
<p>Water use conflicts</p>	<ul style="list-style-type: none"> • Farmers training on water use and develop by laws • Water abstraction laws followed • Enforcement of water Act, 2016 	<p>WRA IWUA Farmers</p>	<p>During water abstraction and use</p>	<ul style="list-style-type: none"> • Amount of water abstracted • Number of farmers farms • Irrigation frequency per farm • Reduced frequency of water related conflicts 	<p>50,000</p>
<p>Soil erosion and Siltation of Surface water resources</p>	<ul style="list-style-type: none"> • Farmers will be expected to implement improved land management practices and soil and water conservation measures • Use excavated earth materials for backfilling • Sprinkling of backfilled trenches with water • Compaction of backfilled trenches • Re-vegetation of excavated 	<p>KCSAP PMC</p>	<p>On a needs-basis</p>	<ul style="list-style-type: none"> • No. of wash points installed • No. of silt traps installed • No. of surface drains constructed • Number of people sensitized on soil and water conservation 	<p>120,000</p>

	areas				
	<ul style="list-style-type: none">• Channeling of surface water runoff away from irrigation channels and pipelines• Construct silt traps				
Sub Total Cost for Operation Phase					Kshs370,000

Potential Impact	Mitigation/ Enhancement Measures	Responsibility	Monitoring means / Frequency	Verifiable Indicators	Estimated Costs (KShs.)
Decommissioning Phase					
Soil erosion and Siltation of Surface water resources	<ul style="list-style-type: none"> • Ensure that a well-directed runoff channels is constructed to nearby water body • Community awareness should be done by the proponent to the downside users • Use excavated earth materials for backfilling • Sprinkling of backfilled trenches with water • Compaction of backfilled trenches • Re-vegetation of excavated areas • Channeling of surface water runoff away from the pipeline route 	Contractor	Regular Inspection	<ul style="list-style-type: none"> • Presence/ absence of stockpiled excavated earth material • No. of silt traps installed • No. of surface drains constructed 	500,000 (integrated in the works costs)
Air Quality Degradation/ Dust Emissions	<ul style="list-style-type: none"> • Evacuation vehicles will only use the designated transport routes. The drivers will also be advised to stick to prescribed speed limits • The contractor will ensure proper repair and maintenance of 	Contractor	Regular Monitoring	<ul style="list-style-type: none"> • Records of water sprinkling • Number of speed limit signs erected • Evidence of use of dust masks by workers on site 	50,000

Potential Impact	Mitigation/ Enhancement Measures	Responsibility	Monitoring means / Frequency	Verifiable Indicators	Estimated Costs (KShs.)
	<ul style="list-style-type: none"> vehicles and equipment to minimize exhaust gases The contractor shall ensure recommended speeds on road sections that will be used by construction vehicles are adhered to on a needs basis to reduce the creation of dusts Construction workers will be provided with dust masks to mitigate 				
Loss of Flora and Fauna	<ul style="list-style-type: none"> The proponent shall ensure minimal clearing of vegetation Transportation of decommissioning wastes to be done through the existing local roads Sensitization of decommissioning work-force on environmental conservation and ecological protection Re-vegetation of cleared areas with indigenous vegetation species 	KCSAP Contractor	Routine inspections	<ul style="list-style-type: none"> No. and type of vegetation cleared No. and type of indigenous species replanted Size of area cleared Size of area re-vegetated 	30,000

<p>Increased Vehicular and Human Traffic</p>	<ul style="list-style-type: none"> • Transportation of decommissioning wastes to specific sites will be done through the existing local roads • The contractor will rehabilitate the local roads that will be 	<p>Contractor</p>	<p>Routine inspections</p>	<ul style="list-style-type: none"> • No. of accidents involving project vehicles • Transportation control logs • No. of road spots rehabilitated 	<p>5,000</p>
--	---	-------------------	----------------------------	---	--------------

Potential Impact	Mitigation/ Enhancement Measures	Responsibility	Monitoring means / Frequency	Verifiable Indicators	Estimated Costs (KShs.)
	<p>damaged during decommissioning activities</p> <ul style="list-style-type: none"> • Consultation with the local communities on planned road diversions • Restriction of Vehicular and Human Traffic to the road reserve where possible 			<ul style="list-style-type: none"> • Community complaints 	
Health and Safety	<ul style="list-style-type: none"> • Continuous supervision of occupational, health and safety management to ensure compliance • The Public Health Office to sensitize on disease causing vectors and avail health care services; 	MOAI	Routine Inspection	<ul style="list-style-type: none"> • HSE inspection reports 	30,000.00
	<ul style="list-style-type: none"> • Occupational Safety and Health Training for contractor's staff 	Contractor	Throughout decommissioning phase	<ul style="list-style-type: none"> • Training reports • Training attendance sheets 	20,000.00

	<ul style="list-style-type: none"> • Orientation talks and visits 	Contractor	At employment of new staff	<ul style="list-style-type: none"> • Orientation report 	5,000
	<ul style="list-style-type: none"> • Toolbox talks (Safety meetings) 	Contractor	On a daily basis	<ul style="list-style-type: none"> • No. of toolbox talks conducted 	5,000
Spread of COVID19	<ul style="list-style-type: none"> • Adhere to the Public health act; 242 legal notice 54 of April 2020, on COVID 19 regulations through provision of social distancing and wearing PPEs. 	MOAI and MOH	Routine Inspection	<ul style="list-style-type: none"> • HSE inspection reports • No. of handwashing points • No. of workers with face masks 	Proponents cost
	Sub Total				1,245,000

CHAPTER NINE: CONCLUSION AND RECOMMENDATIONS

9.1. Conclusion

The primary objective of the proposed project is to enhance access to a sustainable water supply for community domestic and livestock purposes. The adverse impacts anticipated by this study can be effectively managed by the proposed ESMP which includes mitigation measures already thought out in the design and feasibility study phase. Positive impacts of the proposed reservoir construction include poverty reduction, food security, and rural development, among others.

If the suggested mitigation measures and the above recommendations are put in place and the proposed ESMP is followed, the proposed project will not adversely impact the environment. These mitigations will not only be of benefit to the proposed development, but will also assist other stakeholders in understanding and managing the environment.

9.2 Recommendations

This study recommends that the proposed project be allowed to proceed on strict condition that the environmental and social management plan is implemented and follow-up is made to ensure compliance as may be directed by NEMA.

The management is to comprehensively implement the recommendations below in order to improve on their level of compliance.

- Strict adherence to legal requirements in respect to use of personal health and safety equipment will be required in order to avoid potential negative impact of the works to workers and the neighboring community.
- Training of Funan-Idha Project Management Committee on water governance.
- That KCSAP and the County government takes supervisory role in accordance with the ESMP, to ensure that the project is implemented in an environmentally friendly manner.
- Ensure record keeping and documentation are appropriately carried out to assist in building of self-auditing capacity.
- The development should be undertaken since it will improve the standards of reservoir facilities in the area.
- That NEMA issues a CPR License for this proposed Earth Dam project based on the strength of information by this report.

REFERENCE

Reference was made from the following acts:

Government of Kenya (2005); Kenya Gazette Supplement Acts 2000, *Environmental Management and Coordination Act (EMCA) No. 8 of 1999*, Government Printer, Nairobi

Government of Kenya (2005); Kenya Gazette Supplement Acts, *Environmental (Impact Assessment and Audit) Regulations 2003*, Government Printer, Nairobi

Government of Kenya (2005); Kenya Gazette Supplement Acts, *Land Titles Act (Cap 282)*, Government Printer, Nairobi

Government of Kenya (2005); Kenya Gazette Supplement Acts, *Local Authority Act (Cap. 265)*, Government Printer, Nairobi

Government of Kenya (2005); Kenya Gazette Supplement Acts, *Occupational Health and Safety Act, 2007*, Government Printer, Nairobi

Government of Kenya (2005); Kenya Gazette Supplement Acts, *Penal Code Act (Cap.63)*, Government Printer, Nairobi

Government of Kenya (2005); Kenya Gazette Supplement Acts, *Public Health Act (Cap. 242)*, Government Printer, Nairobi

Government of Kenya (2005); Kenya Gazette Supplement Acts, *Registration of Titles Act (Cap 281)*, Government Printer, Nairobi

Government of Kenya (2005); Kenya Gazette Supplement Acts, *Sessional Paper No. 6 of 1999 on Environment and Development*, Government Printer, Nairobi

Government of Kenya (2005); Kenya Gazette Supplement Acts, *Way Leaves Act, (Cap 292)*, Government Printer, Nairobi

Government of Kenya (2006); Kenya Gazette Supplement Acts, *Environmental Management and Coordination (Waste Management) Regulations, 2006*, Government Printer, Nairobi

Government of Kenya (2008); Kenya Gazette Supplement Acts, *Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations, 2008*, Government Printer, Nairobi

Government of Kenya (2009); Kenya Population Census 2009, Government Printer, Nairobi

United Nations (1996); *The Rio Declaration on Environment and Development*

United Nations (1996); *The World Commission on Environment and Development*

ANNEX 1: PUBLIC PARTICIPATION MINUTES OF THE MEETING
Minutes of Community Meeting (Baraza) Held at Funan-Ida location, Uran Ward on 12th Feb 2020

Agenda

1. Opening remarks
2. Team & Project Introduction
3. Concerns, comments and questions from community members on proposed Earth dam
4. AOB

Min 01/2/2020: Opening Remarks

The meeting was called to order by Hassan Kotote (Assistant Chief Walda) at 11:30 am and was opened by a word of prayer by one of the villagers. Mr. Wario introduced the ward Administrator, the veterinary officer, Livestock officer, the Funan Ida Community chairman, the Agricultural Sub County Officer for Moyale Sub County. He welcomed the consultancy firm and mentioned the objective of the proposed public participation forum concerning the proposed earth dam in the area

Min 02/2/2020: Team & Project Introduction

The Lead Expert Mugun Holdings introduced the project and the ESIA-CPR study of the proposed Earth dam to the members elaborating its objectives and the role of communities and leaders in the project.

The legal requirement that development projects are subject to Environmental and Social Impact Assessment was outlined sighting different examples for classes of projects with low, medium and high risks. The consultant explained that the proposed project would have both positive and negative impacts on the surroundings and on the community and welcomed them to voice their concerns, comments and questions.

Min 03/2/20120: Concerns, comments and questions from the community members Project Awareness

The consultant explained to the community the location of the proposed project area stood but it was evident that almost all the residents were familiar with where the proposed dam would be put up. After elaboration from the consultant, it was certain that all the members understood what the project was all about.

Anticipated project benefits

The main impact that the community members raised are availability and accessibility of water. All residents were happy about this new development and promised full support to the project. The positive impacts as discussed during the project meeting included;

- ✓ The project would boost water availability within the location which was currently water deficient
- ✓ Project would ensure regular supply of water for irrigated farming hence improving food security
- ✓ Accessibility of adequate water would reduce the distance travelled to far places in search of water

- ✓ The local residents would benefit from cheap labour from unskilled jobs during the project construction phase. Employment of youths, women and the elderly either directly or indirectly to the project
- ✓ Availability of water would improve health and sanitation
- ✓ The cost of land would generally go up as peoples' lifestyle would improve through availability of water. More people will therefore invest and buy more land in the area.
- ✓ The client will also engage the residents in tree planting activity as a way of compensation for lost trees during the dam construction process.
- ✓ The availability of more food / produce as a result of irrigation will make the prices reduce hence making food more affordable.

Anticipated negative impacts

Noise and dust emissions resulting from construction of the earth dam would result into minimal disturbances and air pollution. Moreover, water borne diseases and injuries would be expected both during construction and operation. Some of the key negative issues and their mitigations discussed included;

- 1) Spread of disease is likely to occur at drinking locations if animals are not properly managed. Proper spacing should therefore be allowed at drinking locations to mitigate against spread of diseases.
- 2) HIV spread from newcomers. Influx workers from various locations including foreign workers to the project area may encourage spread of sexually transmitted diseases. The proponent should ensure proper sensitization to prevent diseases such as HIV/AIDs
- 3) Catchment erosion and siltation of the dam. Increased human activities along the dam banks would also result in siltation. Human activities and rain increase siltation in water reservoirs. The Proponent and contractor should/ would;
 - Plant trees around the dam
 - Sensitize farmers and reducing farming activities around the dam
 - Use appropriate methods of ploughing around the dam
 - Train residents' community on soil erosion control and agroforestry

Min 04/2/20120: A.O.B

There being no other business the meeting ended at 2:00 pm after closing remarks made by Guyo Jillo (Assistant Chief Rawana Sub-location) and a word of prayer by Omar Jarso (Community Opinion Leader).

Confirmed by KCSAP Marsabit

Stamp:



Date: 12/02/2021

ANNEX 2: PUBLIC PARTICIPATION ATTENDANCE LIST



KENYA CLIMATE SMART AGRICULTURE PROJECT

ATTENDANCE LIST

ACTIVITY: Public PARTICIPATION EXERCISE FUNAN IDHAA - WALDA LOCATION
 DATE: 12/02/2021 - COMMUNITY LIST - Community Opinion Leaders

S.NO	NAME	P/NO/ID NO	GENDER	ORGANIZATION	DESIGNATION POSITION	EMAIL	PHONE NO.	SIGNATURE
1	Fekemba SAGWE	20311690	F				0707180724	<i>[Signature]</i>
2	Kaliballa Ganga	5151594	F				0729435089	<i>[Signature]</i>
3	Mariam E. Kibuka	20059813	M	NGAO	A/CHIEF WALDA		0720579570	<i>[Signature]</i>
4	David Wanga Mutu	20811838	M	ELDER			0727075149	<i>[Signature]</i>
5	Calus Juma	30113026	M	ELDER			0717965332	<i>[Signature]</i>
6	Diga Othman Buteo	11503183	M	ELDER			072618769	<i>[Signature]</i>
7	Harari Sam	0067347	M	ELDER			071207089	<i>[Signature]</i>
8	CRAPANE Othman	10631301	M	ELDER			0702211267	<i>[Signature]</i>
9	David Mutu	8841443	M	ELDER			070208014	<i>[Signature]</i>
10	Calus Mutu	20622397	M	ELDER			0726444489	<i>[Signature]</i>
11	David Mutu	23475408	M	ELDER			0704143806	<i>[Signature]</i>



KENYA CLIMATE SMART AGRICULTURE PROJECT

ATTENDANCE LIST

ACTIVITY: PUBLIC PARTICIPATION EXERCISE - FUNJAN - IDITA Community

DATE: 12/02/2021 - Community List

S.NO	NAME	P/NO/ID NO	GENDER	ORGANIZATION	DESIGNATION POSITION	EMAIL	PHONE NO.	SIGNATURE
12	ABDI DIDA WARIO	30420363	M	Youths	KHV		072851619	
13	Guto Hamisi	35739809	M	Youths	Climate Officer		0722113614	
14	Said Juma Galan	22992508	M	Youths	Dist. Edc Secretary		072707544	
15	Habibo Hussein Duda	23973292	M	Youths		habhussaid@gmail.com	072722445	
16	Guya Jillo Galan	22771209	M	NGAO	Nobut Kawana	guyajillo@gmail.com	079634978	
17	Said Juma Galan	12929962	M	ELDER			072208181	
18	Rucha Jillo	22746098	F	ELDER		Jillo@gmail.com	0711858250	
19	Mustafa Juma	2930765	M	ELDER	Youths	Mustafa@gmail.com	071352510	
20	Guto Wario	22284599	M	ELDER	Youths	Guto.wario@gmail.com	072251424	

ANNEX 3: LAND RESOLUTION CONSENT AGREEMENT FORM



COUNTY DEPARTMENT OF AGRICULTURE LIVESTOCK AND FISHERIES

KENYA CLIMATE SMART AGRICULTURE PROJECT (KCSAP)
MARSABIT COUNTY

COMMUNITY LAND RESOLUTION AND AGREEMENT FORM

ITEMS	DESCRIPTION
PROJECT NAME.	FUNAN - IDHA EARTH DAM
COMPONENT 1.	UPSCALING CLIMATE SMART
NAME OF INVESTMENT.	AGRICULTURE PROJECT CONSTRUCTION OF FUNAN-IDHA
PROJECT LOCATION.	EARTH DAM FUNAN-IDHA LOCATION, URBAN- WARD, MONGALE SUB-COUNTY, MARSABIT COUNTY.
GPS COORDINATES.	
ESTIMATED PROJECT COST.	60 million
SOURCE OF FUNDING.	IDA
FINANCIAL YEAR.	2020 / 2021

TERMS OF THE AGREEMENT

1. We the resident/users of the investments area (specify) FUNAN-IDHA AREA..... discussed and agreed that, FUNAN-IDHA LOCATION shall be site of the proposed FUNAN-IDHA EARTH DAM..... and that;
2. We all aware of the Kenya Climate Smart Agriculture Project and this proposed sub-project CONSTRUCTION OF AN EARTH DAM.....
3. We all aware that the land set aside for the investment is community land and no one is claiming individual ownership because it belongs to all of us and negative impacts on particular individuals using the land will be addressed by the community, and no alternative claims will be made later on the land
4. We all have no problem with the site of the investment and its conversion to public land.
5. We have all agreed unanimously that the project implementation should continue.
6. We will allow other neighbouring and cross-border communities access to the investment as agreed between elders of both communities.
7. We all shall strive to peacefully resolve any conflicts with other communities concerning the investment and that we would strive to peacefully co-exist and resolve any conflict arising out of the investment facility following due process provided by the laws of Kenya.
8. The land to be donated was identified in consultation with all residents and users of the land;
9. We all understand the likely impacts of proposed activities on donated land.
10. We all understand that the community could have refused this investment.
11. We all agreed to this investment and donation of the land without coercion, manipulation, or pressure on the parts of public or tradition authorities.
12. We all agreed that we not require any monetary or non-monetary benefits or incentives as a condition for the donation.
13. The land being donated will not reduce the remaning land area to a level below that required to maintain the livelihoods of occupiers and users of land at curent levels and will not requir the relocation af any household.
14. If any structure will be moved or any access to land be limited as a result of the sub-project, the individual affected will be compensated so their livelihood will be affected.
15. The land is free of encumbrances or encroachment and is not claimed by any individual and its ownership is not contested.

have been designated by the community of FUNAN-IDHA LOCATION & LEADERS confirm the above information to be true and that we have resolved to abide by ALL the terms of this agreement. (Please attach minutes of community meeting, where the community agreed to the use and conversion of this purpose).

No.	Name	Location/Village	ID No.	Phone No.	Signature
1	Fahima Sarire	Funan-idha	20311690	0707988879	
2	Diana Guyo Boboo	Funan-idha	11503183	0792618749	
3	Omar Jirso Gudana	Funan-idha	12429962	0727908151	
4	Galgalla Guyo	Funan-idha	8151579	0729435089	
5	Halakhe Guyo	Rawana	0069347	0719247589	

Witnessed on this 12 Day of FEB in the year 2021 by:

1. Area chief

Name	ID No.	Phone No.	Signature/Stamp
Guyos Jullo Gudana	22771209	0796364978	

2. Ward administrator

Name	ID No.	Phone No.	Signature/Stamp
Guyos Fussan J. Kokote	22439813	0720579570	

ANNEX 4: SAMPLE QUESTIONNAIRES



KENYA CLIMATE SMART AGRICULTURE PROJECT (KCSAP)

PUBLIC CONSULTATION FORM FOR PROPOSED EARTH-DAM IN FUNAN-IDHA LOCATION

Kenya Climate Smart Agriculture Project (KCSAP) proposes to Excavate an Earth Dam in Funan-Idha area, Rawana Location, Uran Ward in Moyale sub-county.

The Environmental (Impact assessment and Audit) Regulations of 2003 require that all projects listed in the Second Schedule of the EMCA act 1999 (Revised) Must undertake an ESIA and or SPR. Stakeholder's views and comments are important to be incorporated in the project design/planning, construction and decommissioning stages. This questionnaire is intended for your objective views on the performance of construction/drilling and operation activities of the proposed borehole in order to enable proper decision making by NEMA.

We now seek your comment on the proposed borehole development.

1. Potential Negative Impacts

1a) Do you think the proposed borehole will have negative impacts on the surrounding environment? (tick appropriate answer)

A. YES B. NO

1b) List the potential **negative environmental and social** impacts during the establishment and operations of the proposed borehole (*Multiple responses possible*)

IMPACTS	YES/NO		COMMENT
	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Habitat alteration (Flora and fauna)	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Soil disturbance	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Chemical/oil spills	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Fumes and discharges	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Impact to water quality	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Noise pollution	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Risk of accidents/injuries	YES <input type="checkbox"/>	NO <input type="checkbox"/>	

Solid waste generation	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Environmental degradation	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Dust emissions (air quality)	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Conflict over land/water	YES <input type="checkbox"/>	NO <input type="checkbox"/>	

Any other negative impacts

0. Additional air and noise pollution
- Increased impact of sedimentation

1c) Suggest mitigation measures on the negative impacts mentioned above?

Shield noise from the location machines
Strictly control & construction vehicles

2. Positive Impacts

2a) What are some of the positive impacts associated with the proposed borehole? (Multiple responses possible)

1) provision of jobs to local community
2) provision of water for livestock and domestic use
3) Expansion of business opportunities

3b) Do you think the proposed development is sustainable? YES NO

General concerns

3 Give any other information that may be necessary in regard to the proposed borehole development?

Contact Information

Name of Respondent: Galim Jylylla Gender: Male
Contact: 012 6444439



KENYA CLIMATE SMART AGRICULTURE PROJECT (KCSAP)

PUBLIC CONSULTATION FORM FOR PROPOSED EARTH-DAM IN FUNAN-IDHA LOCATION

Kenya Climate Smart Agriculture Project (KCSAP) proposes to Excavate an Earth Dam in Funan-Idha area, Rawana Location, Uran Ward in Moyale sub-county.

The Environmental (Impact assessment and Audit) Regulations of 2003 require that all projects listed in the Second Schedule of the EMCA act 1999 (Revised) Must undertake an ESIA and or SPR. Stakeholder's views and comments are important to be incorporated in the project design/planning, construction and decommissioning stages. This questionnaire is intended for your objective views on the performance of construction/drilling and operation activities of the proposed borehole in order to enable proper decision making by NEMA.

We now seek your comment on the proposed borehole development.

1. Potential Negative Impacts

1a) Do you think the proposed borehole will have negative impacts on the surrounding environment? (tick appropriate answer)

A. YES

B. NO

1b) List the potential negative environmental and social impacts during the establishment and operations of the proposed borehole (Multiple responses possible)

IMPACTS	YES/NO		COMMENT
Habitat alteration (Flora and fauna)	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Soil disturbance	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Chemical/oil spills	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Fumes and discharges	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Impact to water quality	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Noise pollution	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Risk of accidents/injuries	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	

Solid waste generation	YES[]	NO[]	
Environmental degradation	YES[]	NO[]	
Dust emissions (air quality)	YES[]	NO[]	
Conflicts near land/water	YES[]	NO[]	

Any other negative impacts

1. Minimally air and noise Pollution
2. Minimally impact of Soil Erosion

1c) Suggest mitigation measures on the negative impacts mentioned above?

1. Avoid noise from the drudging Machines
2. Strictly Control Construction Vehicles

2. Positive Impacts

2a) What are some of the positive impacts associated with the proposed borehole? (Multiple responses possible)

1. Provision of jobs to local community
2. Provision of water for livestock and domestic use
3. Expansion of business opportunities

2b) Do you think the proposed development is sustainable? YES NO

General concerns

3 Give any other information that may be necessary in regard to the proposed borehole development?

Contact Information

Name of Respondent: Fatuma Gasire Gender: female
 Contact: 0707983174 FGS



KENYA CLIMATE SMART AGRICULTURE PROJECT (KCSAP)

PUBLIC CONSULTATION FORM FOR PROPOSED EARTH-DAM IN FUNAN- IDRA LOCATION

Kenya Climate Smart Agriculture Project (KCSAP) proposes to Excavate an Earth Dam in Funan-Idra area, Rawana Location, Uran Ward in Moyale sub-county.

The Environmental (Impact assessment and Audit) Regulations of 2003 require that all projects listed in the Second Schedule of the EMCA act 1999 (Revised) Must undertake an ESIA and or SPR. Stakeholder's views and comments are important to be incorporated in the project design/planning, construction and decommissioning stages. This questionnaire is intended for your objective views on the performance of construction/drilling and operation activities of the proposed borehole in order to enable proper decision making by NEMA.

We now seek your comment on the proposed borehole development.

1. Potential Negative Impacts

1a) Do you think the proposed borehole will have negative impacts on the surrounding environment? (tick appropriate answer)

A. YES

B. NO

1b) List the potential **negative environmental and social** impacts during the establishment and operations of the proposed borehole (*Multiple responses possible*)

IMPACTS	YES/NO		COMMENT
Habitat alteration (Flora and fauna)	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Soil disturbance	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Chemical/oil spills	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Fumes and discharges	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Impact to water quality	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Noise pollution	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Risk of accidents/injuries	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	

Solid waste generation	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Environmental degradation	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Dust emissions (air quality)	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Conflict over land/water	YES <input type="checkbox"/>	NO <input type="checkbox"/>	

Any other negative impacts

Mineral air and noise pollution

1c) Suggest mitigation measures on the negative impacts mentioned above?

Mitigation measures on the negative impacts will be address

2. Positive Impacts

2a) What are some of the positive impacts associated with the proposed borehole? (Multiple responses possible)

1. Provision of jobs to the local community.
2. Provision of water for livestock and domestic used.
3. Expansion of business opportunities

2b) Do you think the proposed development is sustainable? YES NO

General concerns

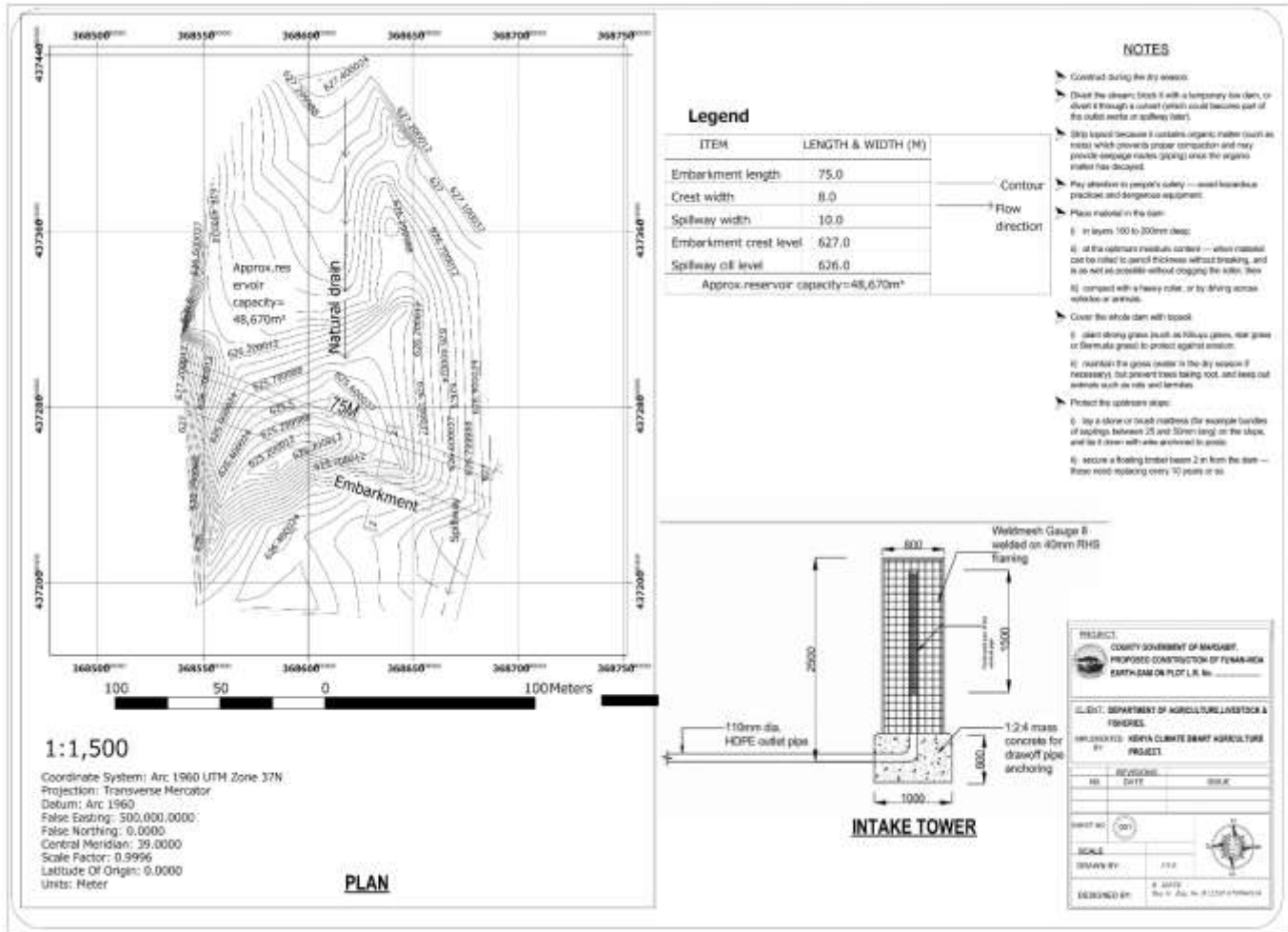
3) Give any other information that may be necessary in regard to the proposed borehole development?

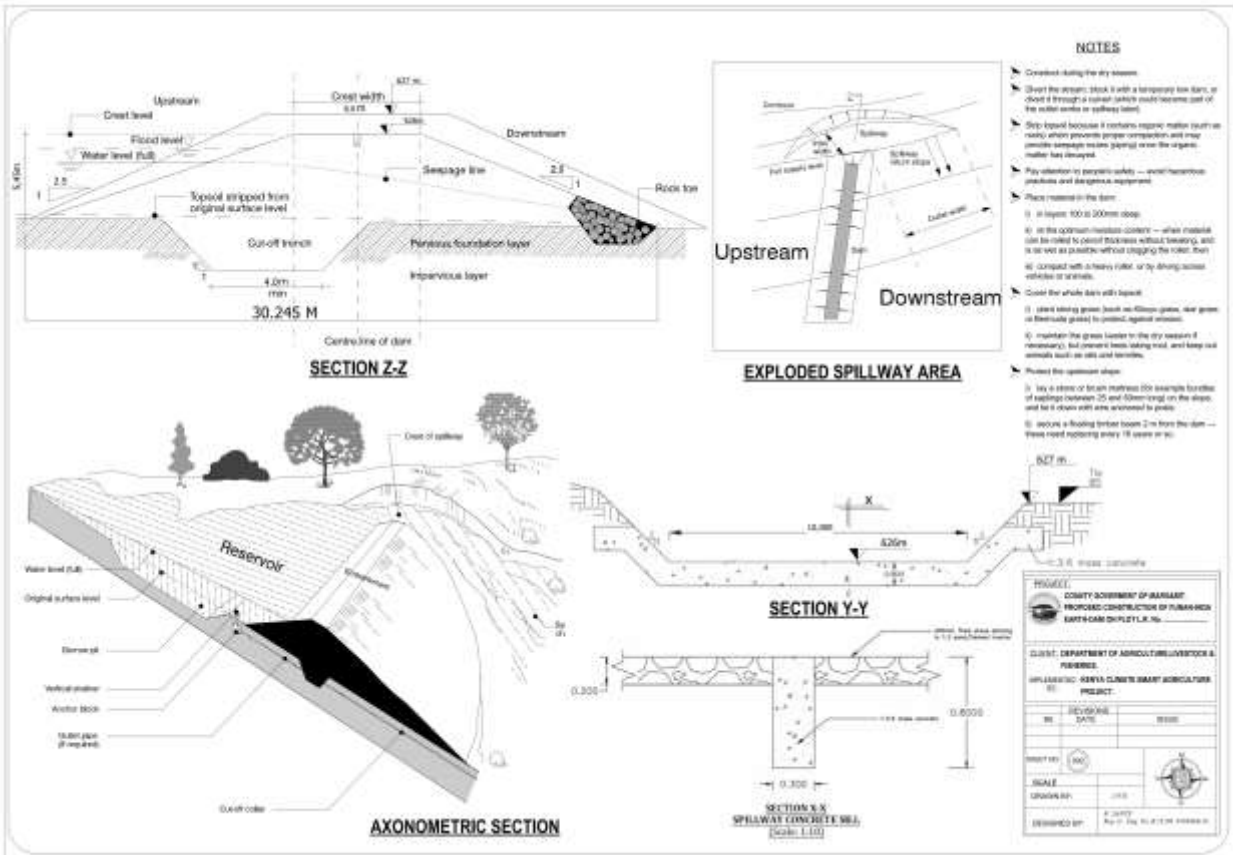
Contact Information

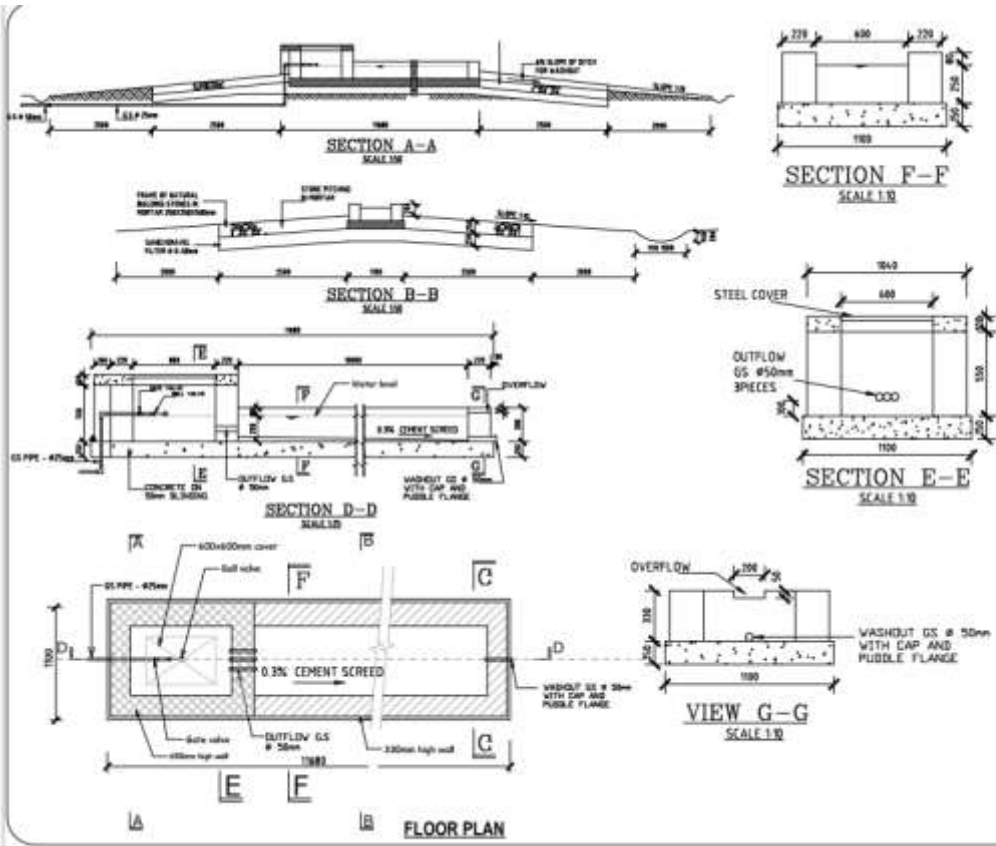
Name of Respondent Hilake Gayo Gender Male
 Contact 0219243559



ANNEX 6: PROJECT DESIGN





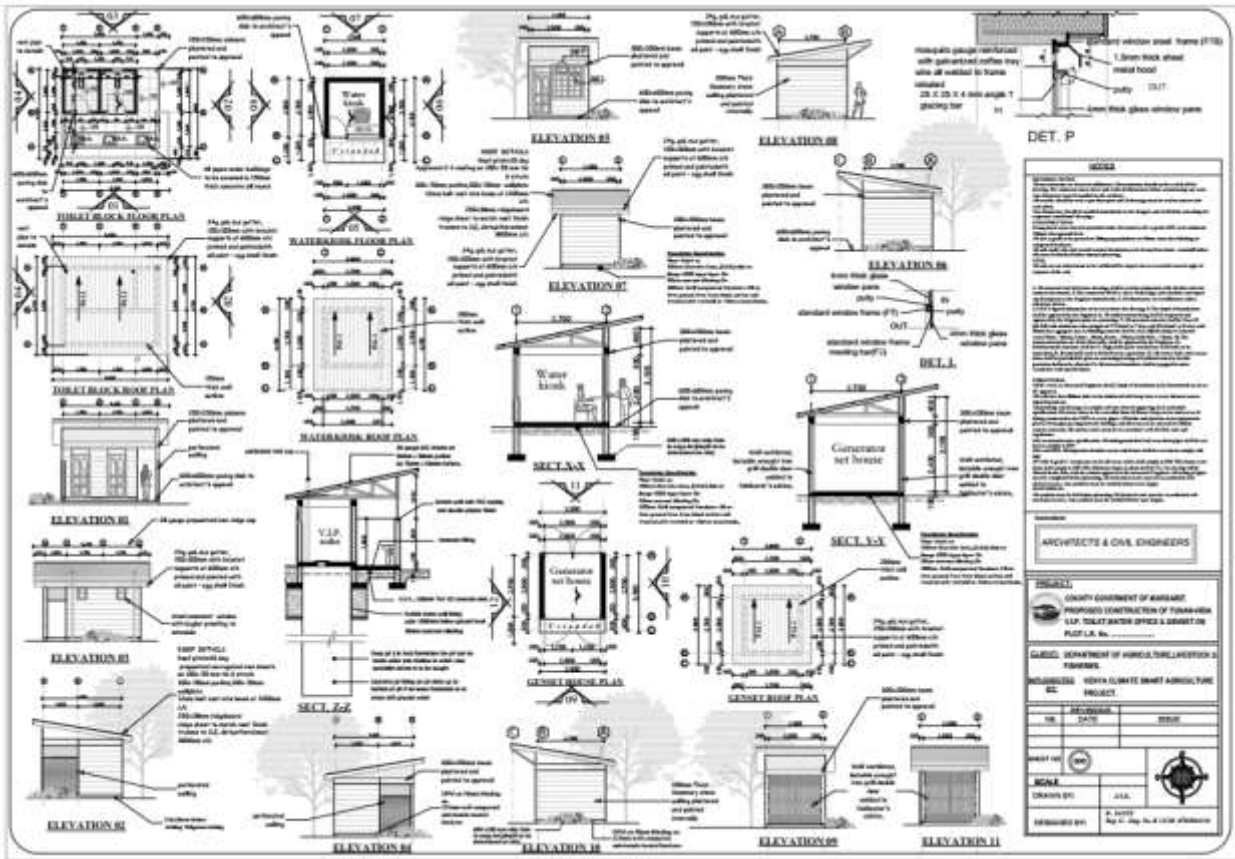


NOTES

1. The Contractor shall be responsible for the design and construction of the drainage system in accordance with the approved drawings and specifications.
2. The drainage system shall be constructed in accordance with the approved drawings and specifications.
3. The drainage system shall be tested and certified by a registered professional engineer before being put into service.
4. The drainage system shall be maintained and kept in good order throughout its useful life.
5. The drainage system shall be constructed in accordance with the approved drawings and specifications.
6. The drainage system shall be tested and certified by a registered professional engineer before being put into service.
7. The drainage system shall be maintained and kept in good order throughout its useful life.
8. The drainage system shall be constructed in accordance with the approved drawings and specifications.
9. The drainage system shall be tested and certified by a registered professional engineer before being put into service.
10. The drainage system shall be maintained and kept in good order throughout its useful life.

ARCHITECTS & CIVIL ENGINEERS

COUNTY GOVERNMENT OF MALDEN
 PROPOSED CONSTRUCTION OF CANAL AND
 LITTLE TROUGH ON PLOT 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.



ARCHITECTS & CIVIL ENGINEERS	
<p>PROJECT: COUNTY GOVERNMENT OF BARABEE PROPOSED CONSTRUCTION OF TOWNHOMES 1111 S. STATE STREET, BARABEE, WISCONSIN 53009</p>	
<p>CLIENT: COUNTY GOVERNMENT OF BARABEE 1111 S. STATE STREET, BARABEE, WISCONSIN 53009</p>	
<p>DATE: 10/15/2024</p>	
<p>SCALE: AS SHOWN</p>	
<p>PROJECT NO.: 2024-01</p>	
<p>DESIGNED BY: A.A.</p>	
<p>DATE: 10/15/2024</p>	
<p>BY: [Signature]</p>	

ANNEX 7: PHOTOS



APPENDICES 3. LEAD EXPERT PRACTISING LICENCE

FORM 7

(r.15(2))



Kenya Climate Smart Agriculture Project

**NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT**

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTISING LICENSE

License No : NEMA/EIA/ERPL/13931

Application Reference No: NEMA/EIA/EL/18299

M/S Wesley K. Langat
(individual or firm) of address

Funan Idha Earth Dam

P.O. Box 378 Kajiado

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **1618**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **2/8/2021**

Expiry Date: **12/31/2021**

EIA CPR-Marsabit 2021

Signature.....

(Seal)
Director General
The National Environment Management
Authority



FORM 7

(r.15(2))



nema
nang'ya yeta | ubul weta | wajiba weta

Kenya Climate Smart Agriculture Project

**NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT**

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/13929

Application Reference No: NEMA/EIA/EL/18298

Funan Idha Earth Dam

M/S **Reuben Kiprotich Mugun**
(individual or firm) of address

P.O.Box 33170-30100 Eldoret

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Associate Expert**
registration number **8107**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **2/8/2021**

Expiry Date: **12/31/2021**

EIA CPR-Marsabit 2021

Signature.....

(Seal)

**Director General
The National Environment Management
Authority**

P.T.O.



ISO 9001: 2008 Certified

FORM 7

(r.15(2))



Kenya Climate Smart Agriculture Project

**NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT**

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/13928

Application Reference No: NEMA/EIA/EL/18297

M/S **Mugun Holdings Limited**
(individual or firm) of address

Funan Idha Earth Dam

P.O.Box 33170-30100, Eldoret

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts**
registration number **8332**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **2/8/2021**

Expiry Date: **12/31/2021**

EIA CPR-Marsabit 2021

Signature.....

(Seal)

**Director General
The National Environment Management
Authority**



