Republic of Kenya
Ministry of Agriculture and Livestock Development
State Department of Agriculture
P.O. Box 30028-00100 Kenya.

African Development Bank (AfDB)
P.O. Box 4861-00200, Nairobi, Kenya.

County Government of Garissa
P.O. Box 563-70100, Garissa

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT
SUMMARY PROJECT REPORT

FOR
THE PROPOSED CONSTRUCTION OF HAJI ADEN COMMUNITY WATER PAN IN HAJI ADEN VILLAGE, LAGO LOCATION, DADAAB SUB COUNTY, GARISSA COUNTY

GPS Coordinates:
Longitude 40.0299955°E, and Latitude 0.0346519°N, 140m above sea level.

Ministry of Agriculture & Livestock Development (MoAL&D)

APRIL 2025

PROPONENT:	LEAD EXPERT:
Ministry of Agriculture and Livestock Development (MoALD) State Department for Agriculture Program to Build Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS) Hill Plaza 9th Floor, Ngong Road P.O. Box 30028 00100 Nairobi, Kenya E-mail: info@kilimo.go.ke. Telephone: +254-20-2718870.	Erick O. Orwa (Lead Expert) Reg. Number 8226 Lead EIA/EA Expert, MSc. LEAD Expert, MEIK, Grad. EBK, Grad. IEK Environment & Social Safeguards Officer P.O. Box 10137-00200, Nakuru Nakuru, Kenya Tel.+254-721178524 **Email:** erick.orwa@gmail.com

FACT SHEET

Project Name	Proposed Construction of Haji Aden Community Water Pan in Haji Aden Village, Lago Location, Dadaab Sub County: Garissa County.
Assignment Name	Summary Project Environmental and Social Impact Assessment (ESIA) Report
Location	Garissa County Dadaab Sub County Abakaile Ward Harbul Location Harbul Sub-Location Haji Aden Village
GPS Coordinates	Longitude 40.0299955°E, and Latitude 0.0346519°N, 140m above sea level.
Project Description	Proposed construction of a 50,000 cubic meter Water Pan comprising of; a) Excavation of the water pan, clearing of overburden materials and the top soil b) Equipping and installation of solar powered pump for the water pan. c) Fencing of the water pan and construction of embankment and draw off works d) Construction of a water kiosk and cattle troughs. e) Construction of ancillary facilities (Toilet, cattle watering trap and community water site)
Project Cost	KSh. 37,392,091.00 (Thirty-Seven Million Three Hundred and Ninety-Two Thousand Ninety-One Shillings Only)
Proponent	Ministry of Agriculture and Livestock Development (MoALD) State Department for Agriculture Program to Build Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS)
Address of the Proponent	Hill Plaza 9th Floor, Ngong Road P.O. Box 30028 00100 **Nairobi, Kenya** E-mail: info@kilimo.go.ke. Telephone: +254-20-2718870.

CERTIFICATION

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

This Environmental Impact Assessment (EIA) Summary Project Report was prepared in accordance with the Environmental Management and Coordination Act (EMCA) 1999 and the Environmental Impact Assessment and Audit Regulations 2003 (revised 2015 & 2019) and the **Africa Development Bank (AfDB)** Environmental and Social Safeguards in order to meet the statutory requirements for the implementation of projects under schedule ii. I, the undersigned, confirm that the contents of this report are a true representation of the ESIA process for the **Proposed Construction of Haji Aden Community Water Pan in Haji Aden Village, Lago Location, Dadaab Sub County: Garissa County.**

LEAD ESIA/ EA EXPERT
Erick O. Orwa
Lead Environmental Expert
Registration No. 8226
P.O. Box 10137-20100
TEL +254 721 178 524
Nakuru, Kenya
erick.orwa@gmail.com

Lead Expert: ..... *Signature*

Date: 13 MARCH 2026

ASSOCIATE ESIA/ EA EXPERT
Erick O. Ogada
Associate Environmental Expert
Registration No. 13489
P.O. Box 54-40100
TEL +254 700 033 598
Nakuru, Kenya
ericogadas@gmail.com

Lead Expert: ..... *Signature*

Date: 13 MARCH 2026

FOR PROPONENT
Ministry of Agriculture and Livestock Development (MoALD)
State Department for Agriculture
Program to Build Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS)

Proponent Representative Name ..... ENG. JOSPHAT NYAMWAMU OMARI

Proponent Representative Title ..... PROJECT ENGINEER - BREFONS

Proponents Representative Contacts ..... +254 720 349 322

Signature: ..... **Date:** 13 MARCH 2026

ACKNOWLEDGMENT

We, the ESIA study team **Mr. Erick O. Orwa (Lead)** and **Mr. Erick O. Ogada (Associate Expert)** wish to acknowledge and express our profound gratitude to the National Project Coordinating Unit (especially Mr. Kennedy Makudiuh; the Project Coordinator and Ms. Janet Oyuke; the Environmental and Social Safeguards Officer) of **Build Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS)** for commissioning this ESIA SPR. We also wish to acknowledge the support received at County level from **Mr. Abdullah Dakane,** who is the **Garissa County Project Coordinator (CPC).**

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

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

TABLE OF CONTENTS

FACT SHEET i
CERTIFICATION i
ACKNOWLEDGMENT ii
TABLE OF CONTENTS iii
LIST OF TABLES xi
LIST OF FIGURES xi
LIST OF PLATES xi
LIST OF ACRONYMS AND ABBREVIATIONS xii
EXECUTIVE SUMMARY xiv
1. INTRODUCTION 1
1.1 BREFONS Project Background 1
1.2 Background of Haji Aden Community Water Pan Sub Project 2
1.3 Justification for the Environmental Summary Project Report 3
1.4 SPR Scope, Objective and Methodology of the ESIA 4
1.4.1 Objectives of the ESIA 4
1.5 Data Collection Procedures and Methodology 5
1.5.1 Environmental Screening 5
1.5.2 Desktop Study 5
1.5.3 Physical Inspection of the Site and Surrounding 6
1.5.4 Public Participation 6
1.6 Data Analysis, Documentation and Report Structure 6
2 PROJECT DESCRIPTION 8
2.1 Introduction 8
2.2 Project Scope 8
2.3 Project Design and Activities 8
2.3.1 Project Design 8
2.3.2 Project Components 8
2.3.3 Water Pan Capacity Description 9
2.4 Storage Design and Surface Area 9

2.4.1 Irrigable Area 10
2.4.2 Water Demand Estimates 10
2.4.3 Main Project Works/Activities 12
2.4.4 Climate Proofing 12
2.5 Construction of ancillary structures 14
2.6 Material and Equipment 14
2.7 Project Activities Categories 14
2.7.1 Planning Phase Activities 14
2.7.2 Construction Phase Activities 14
2.7.3 Operation Phase Activities 15
2.7.4 Decommissioning Phase Activities 15
2.8 Proposed Project cost 15
3 BASELINE INFORMATION 16
3.1 Introduction 16
3.2 Project Location 16
3.3 Physiographic and Natural Conditions 17
3.3.1 Physical & Topographic Features 17
3.3.2 Geology and Soils 18
3.3.3 Biodiversity 19
3.3.4 Climatic Conditions 20
3.4 Socio-economic Environment 20
3.4.1 Population 20
3.4.2 Land Use 21
3.4.3 Energy Access 21
3.4.4 Water and Sanitation 21
4 NATIONAL POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK 22
4.1 General Overview 22
4.2 Policy Framework 22
4.2.1 Kenya Constitution 2010 22
4.2.2 Vision 2030 22

4.2.3 National Gender and Development Policy, 2000.....22
4.2.4 Policy on Gender and Sexual Based Violence 2017.....23
4.2.5 The National Environmental Sanitation and Hygiene Policy-2016-2030.....23
4.2.6 National Food and Nutrition Security Policy (NFSP).....23
4.2.7 The BETA Agenda.....24
4.2.8 National Environment Policy (NEP) 2013.....24
4.2.9 The National Land Use Policy (NLUP) - Sessional Paper, No. 1 of 2017.....24
4.2.10 Kenya National Youth Policy 2006.....25
4.2.11 National Policy on Water Resources Management and Development - Sessional Paper Number 1 of 1999.....25
4.2.12 The National Occupational Safety and Health Policy, 2012.....25
4.2.13 National Land Policy.....26
4.2.14 Garissa County HIV and AIDS Strategic Plan 2016/2019.....26
4.3 Relevant Legislative Framework.....26
4.3.1 Environmental Management and Coordination Act (EMCA) 1999.....26
4.3.2 The Water Act, 2016 (The National and Storage Regulations, 2019).....28
4.3.3 The Public Health Act (Cap. 242).....29
4.3.4 The Physical Planning and Land Use Planning Act, 2019.....29
4.3.5 Penal Code (Cap. 63).....30
4.3.6 The Occupational Health and Safety Act, 2007.....30
4.3.7 Employment Act, 2007.....31
4.3.8 Work injury benefits Act, 2007.....31
4.3.9 National Construction Authority Act (2011).....31
4.3.10 National legal provisions on Gender, HIV/AIDS and Gender Based Violence (GBV) and Sexual Exploitation and Abuse (SEA).....32
4.3.11 The National Museums and Heritage Act 2006.....33
4.3.12 Malaria Prevention Act (CAP 246).....33
4.3.13 County Government Act No. 17 of 2012.....33
4.3.14 Land Act 2012.....34

4.3.15 Energy Act 2019 34
4.3.16 The Standards Act CAP 496 34
4.3.17 Climate Change Act number 11 of 2016 35
4.3.18 HIV and AIDS Prevention and Control Act 2011 35
4.4 Institutional Framework 36
4.4.1 County Government of Garissa 36
4.4.2 Program to Build Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS) 36
4.4.3 African Development Bank (AfDB) 36
4.4.4 Water Resources Authority (WRA) 37
4.4.5 Water Resource Users Association (WRUA) 37
4.4.6 National Environment Management Authority NEMA 38
4.4.7 Department of Occupational Health and safety (DOSH) 38
4.4.8 National Environmental Tribunal 38
4.4.9 Land and Environment Court 38
4.5 African Development Bank Environmental and Social Framework (ESF) 38
4.5.1 OS 1: Environmental and Social Assessment 39
4.5.2 OS 2: Involuntary Resettlement: Land Acquisition, Population Displacement and Compensation 39
4.5.3 OS 3: Biodiversity and Ecosystem Services 39
4.5.4 OS 4: Pollution Prevention and Resource Efficiency 40
4.5.5 OS 5: Labour Conditions, Health and Safety 40
4.5.6 Cross-Cutting Themes: Gender, Vulnerability, and Climate Resilience 40
4.6 International Conventions and Treaties 40
4.6.1 Conservation of Biological Diversity (CBD) Regulations 2006 40
4.6.2 United Nations Convention to Combat Desertification, 1994 41
4.6.3 Sustainable Development Goals (SDGs) 41
5 ANALYSIS OF PROPOSED PROJECT ALTERNATIVES 42
5.1 Introduction 42
5.2 Alternative Location 42

5.3 Alternative Water Sources 42
5.3.1 Exploitation of groundwater 42
5.3.2 Source water from elsewhere 43
5.3.3 Roof water Catchment....43
5.4 The No Project Alternative....43
5.5 Construction of the existing the Water Pan 43
5.5.1 Alternatives construction method- manual vs machines 44
5.5.2 Alternative utilization- Direct fetching from the water pan vs draw points .44
5.5.3 Alternative Construction Materials 44
6 PUBLIC PARTICIPATION & STAKEHOLDER CONSULTATIONS....46
6.1 Introduction....46
6.2 Objectives....46
6.3 Methodology....46
6.3.1 Public Consultation Questionnaires 46
6.3.2 Key Informant Interviews....46
6.3.3 Public Consultation Meetings 47
6.4 Consultation and Disclosure Outputs 48
6.5 Salient Issues 51
6.5.1 Opinion on Project Implementation 51
6.6 Anticipated Impacts.... 51
6.6.1 Positive Impacts.... 51
6.6.2 Anticipated Negative Impacts....52
6.7 Suggestions and comments from public consultations 52
7 ANTICIPATED IMPACTS AND MITIGATION MEASURES 54
7.1 Preamble 54
7.2 Positive Environmental and Social Impacts during construction 54
7.2.1 Employment Creation....54
7.2.2 Market for Construction Materials....54
7.2.3 Increase in Government Revenue 54

7.3 Negative Environmental Impacts and Mitigation during the Construction Phase 54
7.3.1 Temporary Disruption of Land Use and Access 54
7.3.2 Disturbance of Vegetation and biodiversity.....55
7.3.3 Soil erosion 55
7.3.4 Noise and Vibration Generation.....56
7.3.5 Air pollution (Motor vehicle emissions and dust generation) 56
7.3.6 Oil spills 56
7.3.7 Solid waste generation and accumulation 57
7.3.8 Earth Excavated material & desilted silt.....57
7.4 Negative Socio-economic impacts in the construction phase.....57
7.4.1 Occupational Health and Safety (OHS).....57
7.4.2 Risk of Accidents to the community.....58
7.4.3 Increased exposure to transmissible diseases including HIV/AIDS.....58
7.4.4 Labour risks including labour influx 59
7.4.5 Risk of Social Conflict 59
7.4.6 Child Labor and School Dropout.....60
7.4.7 Gender Based Violence (GBV) 60
7.4.8 Sexual Exploitation and Abuse (SEA) by project workers against community members 61
7.5 Positive Environmental and Social Impacts during operation phase 61
7.5.1 Soil Conservation in Project Area. 61
7.5.2 Replenish Groundwater 61
7.5.3 Flood Control 61
7.5.4 Improved Livestock production & Profitability..... 61
7.5.5 Increased Drought Resilience.....62
7.5.6 Improved Food Security 62
7.5.7 Livelihood Diversification.....62
7.5.8 Improved Public Hygiene.....62
7.5.9 Reduction in Water Borne Diseases 62

7.5.10 Increased Household Income 62
7.6 Negative Environmental and Mitigation Measures during the Operation phase 62
7.6.1 Surface and Ground Water Pollution 62
7.6.2 Soil Erosion and Siltation of the Water Pan 63
7.6.3 Water Pan Breaking Its Walls and Associated Risks 63
7.6.4 Solid Waste Generation 64
7.6.5 Risk of Drowning 65
7.6.6 Impacts on River Regime and Downstream Users 65
7.7 Negative Social and Economic Impacts 65
7.7.1 Outbreak of Livestock Diseases 65
7.7.2 Human health impacts e.g., Malaria and schistosomiasis, water borne diseases. 65
7.7.3 Occupational Health and Safety Concerns 66
7.7.4 Water use related conflict 66
7.7.5 Poor leadership and management problems 67
7.7.6 Child labour and school drop out 67
7.8 Decommissioning phase 67
7.8.1 Positive Environmental and Social Impacts 67
7.8.2 Negative Environmental and Social Impacts 67
7.8.3 Mitigation Measures for the Decommissioning of the Water pan 68
8 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP) 69
8.1 Introduction 69
8.2 Environmental and Social Monitoring Programme 78
8.2.1 Monitoring and Management 78
8.2.2 Compliance Monitoring -Pre-construction and Construction phase 78
8.2.3 Compliance Monitoring - Operation Phase Monitoring 78
8.2.4 Effects Monitoring 79
8.2.5 Audits and Reviews 80

8.3 Water Pan Crisis Action Plan (CAP) 80
8.3.1 Emergency Action Plan (EAP) 81
8.3.2 Community Training 81
8.4 Risk Assessment 81
8.5 Water Pan Inspection 82
9 CONCLUSIONS AND RECOMMENDATIONS 83
9.1 Conclusion 83
9.2 Recommendations 83
9.2.1 Implementation 83
9.2.2 Compliance with the Water Quality Regulations 84
9.2.3 Water Pan Crisis Action Plan and Emergency Response Plan (ERP) 84
REFERENCES 85
APPENDICES 88
Appendix I: Sample of Filled Public Consultation Questionnaire 89
Appendix II: Minutes of Public Consultation Meetings 99
Appendix III: List of Attendants for Public Consultation 105
Appendix VI: NEMA Practicing License (Lead and Associate Expert) 109
Appendix V: Land Resolution Form / Consent 111
Appendix VI: Photo Gallery 112
Appendix VII: Chance Find Procedure 115
Appendix VIII: ESIA Inspection form 118
Appendix IX: Water Pan Crisis Action Plan (CAP) 119
Appendix X: Overview of Emergency Action Plan 120
Appendix XI: Haji Aden Water Pan Drawings and Design 121

LIST OF TABLES

Table 2:1: Community Water Demand 9
Table 2:2: Summary Water Demand in Haji Aden Zone..... 10
Table 6:1: Summary of Issues Raised by the Community and Stakeholders 48
Table 8:1: Environment and Social Management and Monitoring Plan 70
Table 8:2: Monitoring Indicators.....79
Table 8:3: Class of Water Structures 81

LIST OF FIGURES

Figure 3:1: Proposed Project Location Map..... 16
Figure 3:2: Satellite Imagery of the proposed site..... 17
Figure 3:3: Topography and terrain of the area 18
Figure 3:4: Soil map of the project area..... 19
Figure 3:5: Project environment.....20

LIST OF PLATES

Plate 6:1: The community member filling public questionnaires. 47
Plate 6:2: The ESIA Lead expert explaining the project impacts to the community.....48

LIST OF ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
AfDB	African Development Bank
ASAL	Arid and Semi-Arid Land
BREFONS	Program to Build Resilience for Food and Nutrition Security in the Horn of Africa
CAP	Crisis Action Plan
CBOs	Community Based Organizations
CDDC	Community Driven Development Committee
CESSCO	County Environment and Social Safeguard Compliance Officer
CGS	County Government of Garissa
CIAP	Community Integrated Action Plan
CIDP	County Integrated Development Plan
CMS	Convention on Migratory Species
COC	Code of Conduct
CPCU	County Project Coordination Unit
CPP	Consultation, Public Involvement, and Participation
CPs	Contracting Parties
CSR	Corporate Social Responsibility
DRSLP	Drought Resilience and Sustainable Livelihoods Programme.
EAP	Emergency Action Plan
EAs	Environmental Assessments
EMCA	Environmental Management and Coordination Act
ER	Emergency Response
ERP	Emergency Response Plan
ESIA	Environmental and Social Impact Assessment
ESIA/ EA	Environmental and Social Impact Assessment /Environmental Audit
ESMMP	Environment & Social Management Monitoring Plan
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
FGD	Focused Group Discussion
FPIC	Free Prior and Informed Consultation
GBV	Gender Based Violence
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GRM	Grievance Redress Mechanism
IAPs	Interested and Affected Parties
IFC	International Finance Corporation
ISLM	Integrated Sustainable Land Management
IUCN	International Union for Conservation of Nature

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

EXECUTIVE SUMMARY

The Building Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS) is a Kenyan government initiative funded by the African Development Bank (AfDB). Implemented by the State Department for Crop Development under the Ministry of Agriculture and Livestock Development (MoALD), BREFONS seeks to address food insecurity and climate vulnerabilities in arid and semi-arid regions. The program promotes sustainable agropastoral practices, improved household incomes, and enhanced climate adaptation, and builds on previous initiatives such as DRSLP I, SIVAP, and RLACC. It targets seven counties: Baringo, Isiolo, Marsabit, Samburu, Turkana, West Pokot, and **Garissa.**

As part of this initiative, the Haji Aden Community Water Pan Subproject was identified through a participatory process involving the community and county government officials, coordinated by the BREFONS County Coordinating Unit (CCU) in Garissa. Located in Haji Aden Village, Dadaab Sub County, the site faces severe water scarcity. The community depends on a saline borehole, drilled under the World Bank's Dr. DIP project in 2022, which is only suitable for livestock. Alternative sources such as the Kulan Water Pan are located far away, while others rely on the Tana River, exposing them to physical danger, including crocodile attacks.

With a growing population of over 80 households and a significant number of livestock, the demand for a safe and reliable water source is urgent. The proposed water pan aims to provide clean water for domestic and livestock use, reduce trekking distances, improve hygiene through gender-segregated sanitation facilities, and support small-scale agriculture and income-generating activities. This intervention is expected to ease the burden on women and children, enhance health and livelihoods, and strengthen the overall resilience of the Haji Aden community.

In adherence to Kenyan government policy, all new projects or activities require an Environmental and Social Impact Assessment (ESIA) during the planning stages. This ensures that significant environmental and social impacts are addressed throughout the project lifecycle from planning and design to construction, operation, and decommissioning. The screening process conducted in June 2024 identified the proposed Haji Aden Community Water Pan project as a ***Low-Risk Project*** according to the 2nd schedule of the Environmental Management and Coordination Act (EMCA Cap 387), as amended via legal notice no. 31 in April 2019. Additionally, the project falls under Category 3 according to the African Development Bank's Integrated Safeguards System (ISS) regarding Environmental and Social Risk Classification.

Therefore, the proponent – Ministry of Agriculture and Livestock Development (MoALD) State Department for Agriculture; Program to Build Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS) – undertook Environmental and Social Impact Assessment and developed a **Summary Project Report (SPR)** pursuant to Regulation 7 (1) of the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019.

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

The assessment involved largely an understanding of the project background, the preliminary designs and the implementation plan as well as commissioning. In addition, baseline information was obtained through physical investigation of the site and the surrounding areas, public consultation (which included discussions with local administration and the community), photography, as well as discussions with the Proponent. A total of **22 persons (12 Male and 9 Female) of whom seventeen (9) were youth** participated in the public participation exercise that took place in **Haji Aden Village** on **20th March, 2025** where a total of **10 questionnaires** were administered and completed. The process culminated in the preparation of an ESIA summary project report encompassing the details specified in the Environmental Impact Assessment/Audit Regulations (2003) and subsequent amendments (2015 &2019).

While there are strong reasons supporting the implementation of the project in this area, it is important to acknowledge that it may also pose certain environmental and social risks. As such, appropriate mitigation strategies are necessary to minimize these negative impacts. During the construction phase, a number of environmental concerns are expected to arise, each requiring specific measures to address them. These include temporary restrictions to site access, disruption of local vegetation and biodiversity, potential for soil erosion, increased noise and vibrations from construction machinery, and air pollution resulting from dust and vehicle emissions. Additional environmental risks such as oil spills, improper disposal of solid waste, and accumulation of excavated or desilted materials must also be managed to avoid degradation of the surrounding ecosystem.

Social risks during construction include potential hazards to worker health and safety, increased chances of accidents affecting the community, and the spread of diseases such as HIV/AIDS. Other concerns include labor-related issues such as the influx of workers, the potential for social tension or conflict, child labor, school dropouts, and incidents of gender-based violence or sexual exploitation by project personnel.

To address these risks, several mitigation measures are proposed. These include conducting noisy work during daytime hours, using low-noise equipment, and installing sound barriers to control noise and vibrations. To manage air quality, actions such as using low-emission vehicles, sprinkling water on dusty roads, and covering materials in transit are recommended. Oil spill prevention will involve proper storage practices, staff training in spill response, and regular equipment maintenance. Soil erosion can be minimized using techniques such as silt fencing, erosion blankets, and terracing. Waste management will focus on sorting waste, promoting recycling, and implementing structured disposal plans.
In the operational phase, the focus shifts to maintaining water quality through regular monitoring, preserving vegetation cover to prevent erosion and siltation, and ensuring structural safety through regular inspection and maintenance of embankments. Worker health and safety will be safeguarded through protective equipment and routine health checks. To prevent conflict, community engagement will be encouraged alongside the development of water allocation guidelines and conflict resolution mechanisms.
Collectively, these measures aim to reduce environmental degradation and social harm, while ensuring the long-term sustainability and positive impact of the project on community well-being and resilience.

An environmental and social management plan has been developed in this report to assist the proponent in mitigating and managing environmental and social impacts associated with the life cycle of the project. It is noteworthy that key factors and processes may change through the life of the project and considerable provisions have been made for dynamism and flexibility of the ESM&MP. As such, the ESM&MP should be subjected to periodic review for improvement purposes. The ESM&MP should be shared with the selected contractor (C-ESMMP) for implementation. This summary project report estimates that in addition to the contracted cost; **Ksh. 980,000** should be allocated during construction phase and at least **Ksh. 1,025,000 per year** during operation phase. Additionally, **Ksh. 230,000** should be allocated during decommissioning phase of the project.

1. INTRODUCTION

1.1 BREFONS Project Background

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

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

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

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

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

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

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

2. **Supporting Agribusiness Development:** Activities under this component aim to empower agro-pastoral communities through capacity building in livestock insurance, technology adoption, and crop campaigns.
3. **Enhancing Adaptive Capacity to Climate Change:** Measures include disseminating climate information, strengthening partnerships for climate risk insurance, and capacity building for early warning systems.
4. **Project Management and Coordination:** This component emphasizes capacity building at institutional levels to ensure efficient project execution and mainstreaming of cross-cutting issues like environmental safeguards and gender equality.
5. **Project Impact and Sustainability**

The expected outcomes of BREFONS are diverse, ranging from increased agricultural productivity and job creation to improved climate resilience among farmers and pastoralists. By targeting nearly 183,000 households across seven counties, the project seeks to create lasting impacts on food security and livelihoods in Kenya's vulnerable regions.

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

In complying with the Kenyan development regulations, the proponent commissioned the Experts to prepare this Environmental and Social Impact Assessment (ESIA) Summary Report for the ***Proposed Construction of Haji Aden Community Water Pan in Haji Aden Village, Lago Location, Dadaab Sub County: Garissa County.*** The report provides the project background as well as an assessment of the associated beneficial and adverse environmental and social impacts of the development.

1.2 Background of Haji Aden Community Water Pan Sub Project

The Proposed Haji Aden Community Water Pan is a strategic subproject under the Building Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS) program, implemented by the State Department for Crop Development under the Ministry of Agriculture and Livestock Development (MoALD), with support from the African Development Bank (AfDB). The site is located in Haji Aden Village of Garissa County. It was identified and prioritized through a participatory process involving local community members and county government officials, coordinated through the County Coordinating Unit (CCU) of BREFONS in Garissa.

Haji Aden Village currently faces acute water scarcity. The community relies on a single borehole drilled under the World Bank-funded Dr. DIP project in 2022, which yields saline water unsuitable for human consumption. This borehole is only used for livestock watering. In fact, a reported case in 2022 involved a pregnant woman who fell seriously ill after consuming water from this source, highlighting the urgent need for safe drinking water. The nearest alternative water source, the Kulan Water Pan, is located far away near the local MP's office, making it difficult for the community to access. Other nearby settlements, such as Hargabul and Seretho, are located approximately 25 km from Haji Aden Village.

Due to the lack of reliable water, some residents have resorted to traveling long distances to the Tana River to fetch water. This not only imposes a heavy burden on households but also exposes them to serious safety risks, including potential crocodile attacks. The growing population now estimated at over 80 households, along with significant livestock ownership has intensified the demand for a sustainable and safe water source.

The proposed construction of the Haji Aden Community Water Pan is expected to bring numerous benefits to the local population. These include improved access to clean water for domestic and livestock use, enhanced hygiene and sanitation through the provision of separate male and female toilets, and support for small-scale agriculture and other income-generating activities. In particular, the reduced need to trek long distances for water will significantly ease the burden on women and children, improve household health, and contribute to the village's socio-economic development and resilience.

1.3 Justification for the Environmental Summary Project Report

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

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

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

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

1.4 SPR Scope, Objective and Methodology of the ESIA

1.4.1 Objectives of the ESIA

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

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

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

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

1.5 Data Collection Procedures and Methodology

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

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

1.5.1 Environmental Screening

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

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

1.5.2 Desktop Study

Desktop study included documents review on the nature of the proposed activities, project documents including designs, policy and legislative framework as well as the environmental

setting of the area among others. Key documents reviewed included the following: Kenya policies, strategies and guidelines; National and County laws and regulations; applicable Multilateral Environmental Agreements (MEAs) and African Development Bank social and environmental safeguard policies.

1.5.3 Physical Inspection of the Site and Surrounding

Physical inspection of the proposed site which included field investigation at site and surrounding areas was done in on **20th March 2025.** The field investigations were meant for physical inspections of the site characteristics and the environmental status of the surrounding areas to determine the anticipated impacts from the project.

1.5.4 Public Participation

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

Given the nature of the project and anticipated impacts, one major public meeting was conducted targeting respective members of **Haji Aden Water Pan Community** and the neighbouring community on **20th March 2025** at Haji Aden Village where **20 participants** attended (see attendance list-***appendix III*** and minutes of the public consultation meeting-***Appendix II***). This was done in order to incorporate the concerns and views of all persons and individuals in the project neighbourhood. Further, key informant interviews/consultations were conducted to incorporate views from key stakeholders as described in chapter 5.

1.6 Data Analysis, Documentation and Report Structure

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

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

- **Chapter 1: Introduction:** *Gives Background Information to the Study Describing the Objectives and the Terms of Reference.*
- **Chapter 2: Project Description:** *Description of Project Site.*

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

2 PROJECT DESCRIPTION

2.1 Introduction

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

2.2 Project Scope

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

2.3 Project Design and Activities

2.3.1 Project Design

Rainwater harvesting provides an alternative and reliable water source. The proposed surface rainwater harvesting technology by constructing a water pan to store rainwater/ surface runoff within a watershed is best suited for developing rural communities that have limited sources of water. Several factors including topography, regional geology, the hydrology of the Haji Aden watershed, weather information, the environmental and geotechnical conditions of the water pan were considered in the designing of the proposed water reservoir. The water pan has been designed to meet the existing water and irrigation demand, support upstream conservation measures in the Haji Aden zone and reduce flooding in the downstream.

2.3.2 Project Components

The project is made up of the following major components:

i. Excavation of the water pan area
ii. Intake and draw off works.
iii. Solar powered pump and solar structure.
iv. Elevated Storage tank 10m^3.
v. 1. No water trough
vi. Community water point.
vii. Chain-link Fence.

The proposed project entails construction of an existing pan to to achieve storage of at least 50,000m^3. Adopting an 8-hour pumping period, the rising water main will be designed for 3.51 litres per second capacity.

2.3.3 Water Pan Capacity Description

The proposed project entails the construction of an existing water pan to achieve a target storage capacity of 50,000 cubic meters (m³). This intervention aims to improve water security for both livestock and domestic use in an arid and water-stressed region like Garissa County. The pan will be deepened to an average of 7 meters, with engineered side slopes to ensure structural stability, minimize erosion, and reduce sedimentation.

2.4 Storage Design and Surface Area

Given a design volume of 50,000 m³ and an average depth of 7 meters, the estimated surface area of the water pan is approximately:

- 7,143 m²

- 0.714 hectares

- 1.76 acres

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

Community Water Demand Analysis

Based on the existing population of:

- 1,000 camels
- 10,000 shoats (sheep and goats)
- 500 donkeys
- 500 households (~2,750 people)

The total daily water demand is estimated as follows:

Table 2:1: Community Water Demand

Use Category	Daily Demand (Litres)	Daily Demand (m³)
Livestock	80,000	80
Domestic use	55,000	55
Total	135,000	135

Pan Supply Duration (No Refill Scenario)

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

- 50,000 m³ / 135 m³ per day = ~370 days

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

Sustainability Considerations

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

The proposed 50,000 m³ water pan offers adequate capacity to support a moderate-sized pastoralist community over an extended dry season. With proper operation and maintenance, community sensitization, and equitable distribution systems in place, the pan will serve as a reliable water source for livestock and domestic use, helping build resilience against prolonged drought periods within Haji Aden Community.

2.4.1 Irrigable Area

Community did not express need for irrigation.

2.4.2 Water Demand Estimates

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

Table 2:2: Summary Water Demand in Haji Aden Zone

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

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

The Haji Aden Water Pan has been designed with a storage capacity of 50,000 cubic meters (m^3), which is adequate to meet the estimated daily water demand of 135 m^3 for both livestock and domestic use within the surrounding community. Site assessments confirmed the feasibility of constructing a pan of this capacity at the proposed location. The full reservoir area is approximately 7,761.24 m^2, with a maximum water depth of 2.2 meters, tailored to local topographic and hydrological conditions. The system is expected to yield 101 m^3 per day under an 8-hour pumping regime, ensuring reliable water supply for most of the year. The design life of the structure is 20 years, with the primary raw water source being surface runoff collected during seasonal rainfall events.

a. Water pan Freeboard

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

b. Silt trap Design

This design recommends silt trap size of 30*30 m with a depth of 3 m.

2.4.3 Main Project Works/Activities

a) Site Clearance/ Reservoir Extraction (Earthworks)

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

b) Silt trap excavation and construction

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

2.4.4 Climate Proofing

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

1. Incorporating Rainfall Variability

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

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

2. Sedimentation Control and Erosion Management

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

3. Flood Management and Overflow Systems

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

4. Water Loss Reduction

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

5. Water Conservation Technologies

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

6. Sustainable Livestock and Community Watering Points

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

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

2.5 Construction of ancillary structures

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

i. Excavation of the water pan area
ii. Intake and draw off works.
iii. Solar powered pump and solar structure.
iv. Elevated Storage tank 10m3.
v. 1. No water trough
vi. Community water point.
vii. Chain-link Fence.

2.6 Material and Equipment

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

2.7 Project Activities Categories

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

2.7.1 Planning Phase Activities

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

2.7.2 Construction Phase Activities

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

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

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

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

2.7.3 Operation Phase Activities

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

2.7.4 Decommissioning Phase Activities

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

2.8 Proposed Project cost

The costs of establishing Haji Aden water pan estimated to have a capacity of **50,000m³** is **KSh. 37,392,091.00 (Thirty-Seven Million Three Hundred and Ninety-Two Thousand Ninety-One Shillings Only.)** which includes the cost of preliminaries, excavation of the reservoir, spillway and established of ancillary facilities.

3 BASELINE INFORMATION

3.1 Introduction

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

3.2 Project Location

The proposed Haj Aden Water Pan is located in Garissa County within the North Eastern region of Kenya bordering the Republic of Somalia to the East, Lamu County to the South, Tana River County to the West, Isiolo County to the Northwest and Wajir County to the North. The county spans latitude 0.111212^0 S and longitude 40.314243^0 E and has a total area of 44,753 Km^2.

The proposed water pan is in **Haji Aden Village, Harbul Sub-location, Harbul Location, Abakaile Ward, Dadaab Sub-County, and Garissa County** adjacent to Faf Jelu dry river bed. The site is accessible via Garissa-Dadaab Road and adjacent to the road approximately 65 Km from Garissa town past Alango Shopping Centre.,

The site lies on coordinates **Longitude 40.0299955°E, and Latitude 0.0346519°N, 140m above sea level**. The map below and Satellite imagery give a detailed description of the project location.

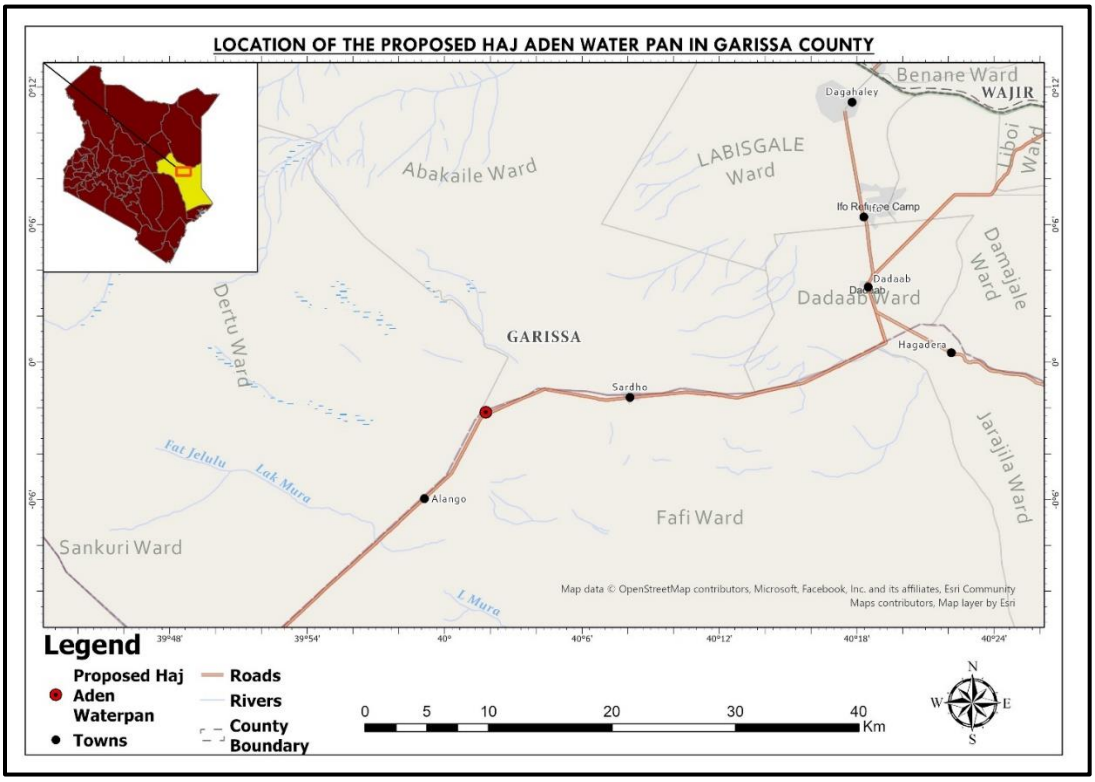


Figure 3:1: Proposed Project Location Map

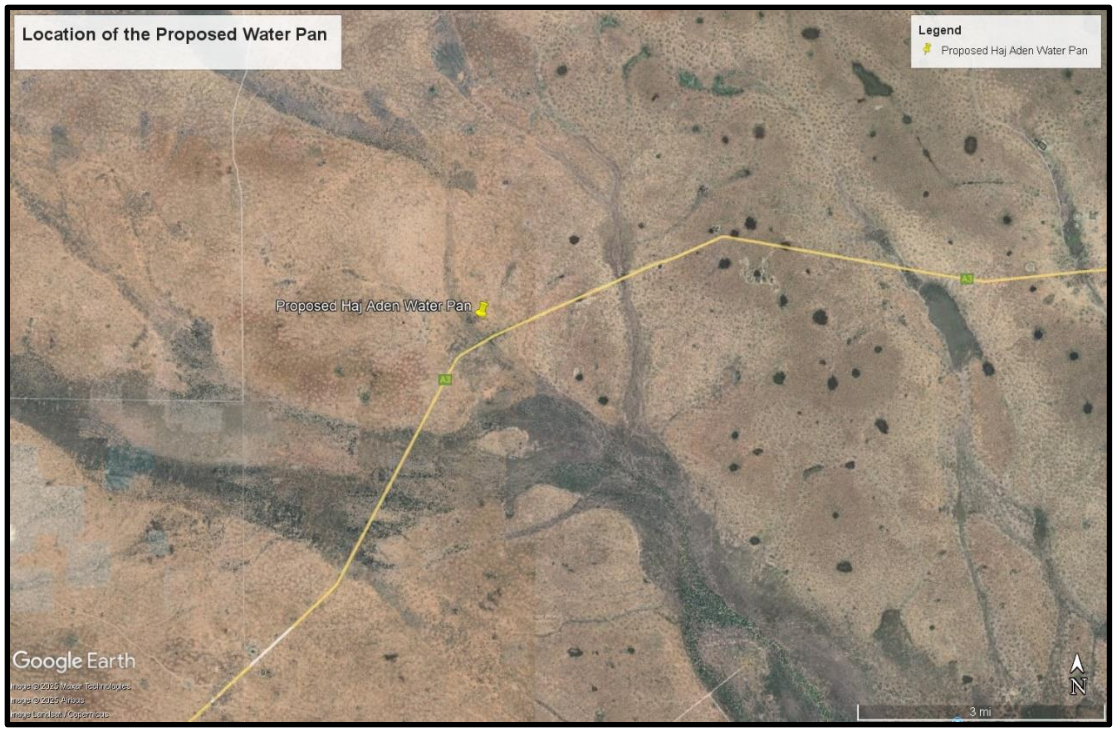


Figure 3:2: Satellite Imagery of the proposed site

3.3 Physiographic and Natural Conditions

3.3.1 Physical & Topographic Features

The project area is situated within Garissa County, which is generally characterized by a relatively flat or undulating plain with occasional low hills. The elevation in the region varies between 20 meters to 400 meters above sea level. The major physical features include seasonal Laghas, the Tana River Basin on the western side, the Ewaso Ngiro River, and the Lorian Swamp to the northeast.

The Abakaile area, where the proposed project is located, lies within the lowland region of Garissa County, with altitudes ranging from 265 meters to 84 meters above sea level. The highest elevation is found in the southwestern parts, from where the land slopes gently towards the northeastern areas, leading to the Tana riverbed. The proposed site specifically lies at an altitude of approximately 140 meters above sea level.

The slope of the project area is generally low, with a gradual gradient. The western and southwestern areas exhibit slightly steeper terrain, while the eastern and northeastern sections are more level, facilitating water flow towards the Tana River to the southeast. The area is also characterized by small seasonal rivers, which only contain water during the rainy seasons and drain into the Tana River from the north and west of the project area. These seasonal rivers last only a few months, rendering the area with limited surface water supply for most of the year.

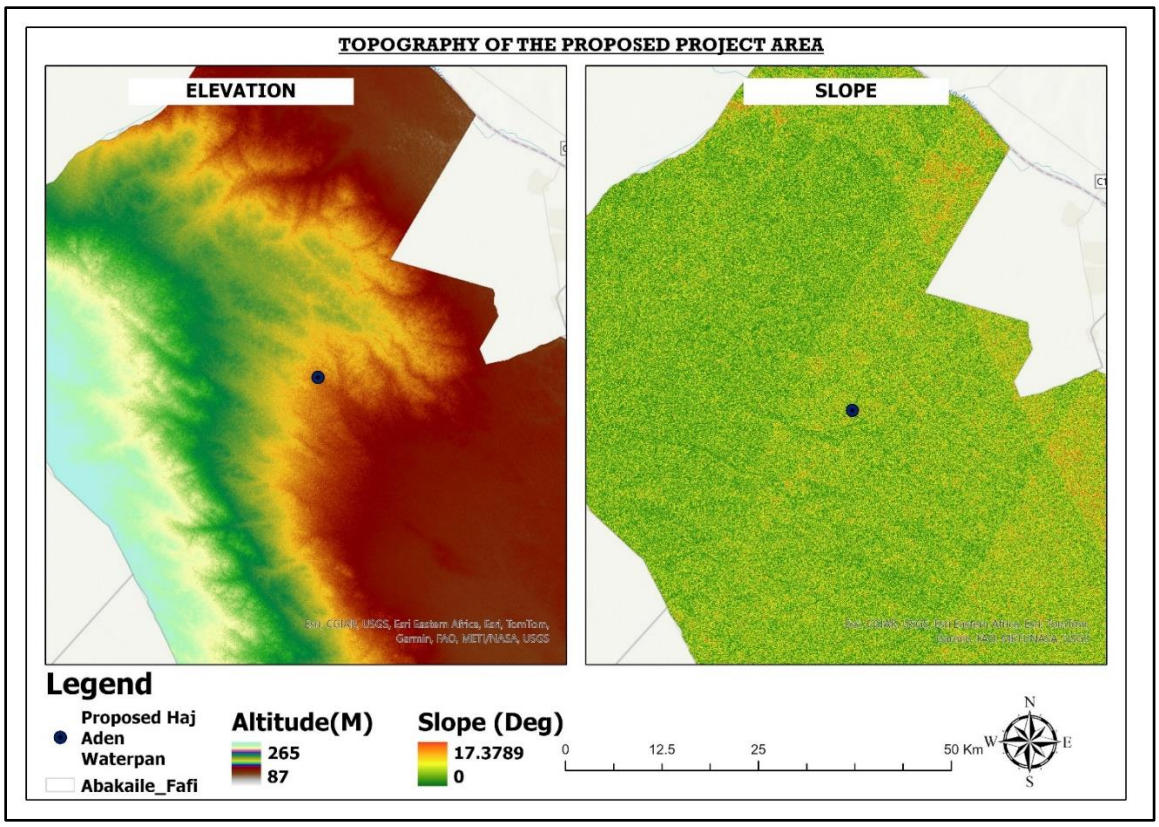


Figure 3:3: Topography and terrain of the area

3.3.2 Geology and Soils

Garissa County is geologically situated within the Anza rift basin, which features an accumulation of up to 4000 meters of Maastrichtian-Paleogene continental clastic. This basin extends inland from the coast in a north-western direction, connecting the Lamu embayment in southern Kenya with the South Sudan rifts.

The geological composition of the project area is dominated by non-carbonate rocks, alluvial-fluvial deposits, and colluvium deposits. The non-carbonate formations, which cover a significant portion of the region, consist of sediments that have undergone minimal chemical alteration, contributing to poor soil fertility and low organic matter content. The presence of alluvial-fluvial deposits along seasonal riverbeds and drainage lines indicates periodic sediment accumulation due to water erosion. These deposits tend to have higher fertility but retain moisture for only a short period after rainfall. Additionally, colluvium deposits, formed by the downslope movement of materials, are found in some localized areas and exhibit variable soil fertility, depending on the nature of the parent material

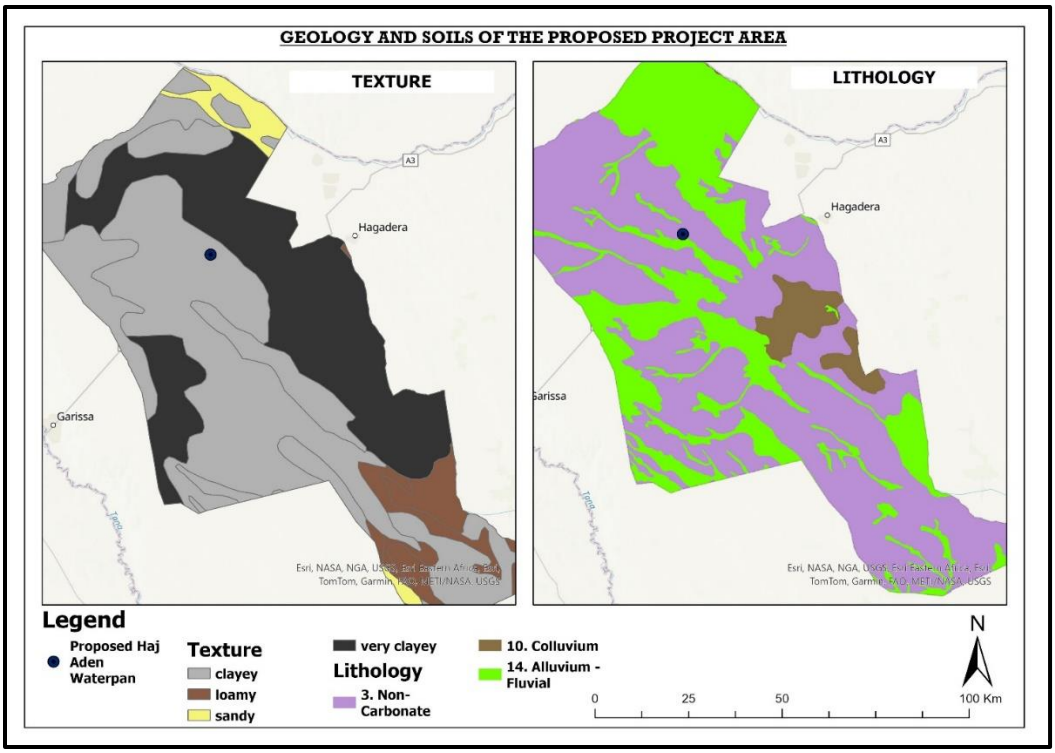


Figure 3:4: Soil map of the project area

The soil texture within the project area varies, with a predominance of clayey soils, interspersed with patches of loamy and sandy soils. The clayey presents challenges related to water infiltration and root penetration, limiting agricultural viability. Small sections of the area contain loamy and sandy soils, which exhibit better drainage but are highly porous, making them unsuitable for sustained crop production. The area experiences soil erosion caused by strong winds, seasonal flooding, and sparse vegetation cover. Ephemeral watercourses temporarily retain water during the rainy season but dry up quickly due to high evaporation rates and porous soils.

3.3.3 Biodiversity

Abakaile lies within an arid-adapted ecosystem, where both vegetation and wildlife have evolved to withstand harsh climatic conditions. The scarcity of water and frequent droughts significantly influence the region's ecological balance, making conservation efforts crucial for maintaining biodiversity and supporting local livelihoods.

The vegetation in the area primarily consists of drought-resistant plant species that provide forage for livestock and wildlife. Dominant species include *Acacia tortilis* and *Acacia mellifera*, which offer shade and fodder, as well as *Commiphora* shrubs and *Euphorbi*a species, which thrive in dry environments while contributing to soil stabilization. Thorny grasses are also prevalent, forming an essential grazing resource.

The region supports a diverse range of wildlife, including large herbivores such as giraffes, lesser kudu (*Tragelaphus imberbis*), gerenuks (*Litocranius walleri*), and dik-diks (*Madoqua kirkii*). Warthogs (*Phacochoerus africanus*) are also common, particularly near seasonal

water sources. Predatory species such as jackals and hyenas inhabit the area, while lions and cheetahs are occasionally sighted, though their numbers have declined due to habitat loss and human activities.

Additionally, the area is home to various bird species, including scavengers like vultures, which play a crucial role in maintaining ecological balance by feeding on carrion. Ground-dwelling birds such as guinea fowls are common in the dry grasslands, while species like hornbills and secretary birds are occasionally spotted.

Figure 3:5: Project environment

3.3.4 Climatic Conditions

Abakaile is located within the semi-arid regions of Kenya, characterized by average annual temperatures of around 30°C. The highest temperatures, reaching up to 41°C, occur between January and March, while the lowest temperatures, around 20.6°C, are typically observed between June and July. Rain falls during two seasons from March to May and from October to December. The wettest months are April and November June and July are the coolest months, the skies being often cloudy and a little drizzle may be experienced. The project area is within the vicinity of Dadaab town from which the climate of the area can be inferred. Rainfall in the area is low, bimodal, erratic, and convectional. The total annual rainfall ranges between 280 mm and 900 mm.

3.4 Socio-economic Environment

3.4.1 Population

Garissa County had a population of 841,353 as per the 2019 Kenya Population and Housing Census (KNBS, 2019). Within the county, Dadaab Sub-County recorded a total population of 185,252 individuals, consisting of 99,059 males and 86,185 females. Haji Aden village, located within this sub-county, comprises approximately 80 households, with

each household accommodating an estimated 6 to 10 individuals. This brings the village's total population to between 480 and 800 people.

The community primarily engages in pastoralism, with livestock rearing serving as the main economic activity. Due to the arid climate, settlement patterns and population growth are shaped by resource availability, seasonal migration, and climate variations. Many families relocate periodically in search of water and pasture for their livestock. The village faces significant challenges, including inadequate access to essential services such as healthcare, education, and clean water.

3.4.2 Land Use

Land use in Haji Aden Village is primarily characterized by pastoralism, with extensive grazing lands supporting camels, goats, sheep, cattle, and donkeys, which are vital for the local economy. The semi-arid climate and low soil fertility limit crop farming, with only small-scale agriculture practised near seasonal Laghas during the rainy season. The village consists of communal settlements, market centres, and minimal infrastructure development. However, increasing human and livestock populations have resulted in land degradation, overgrazing, and competition over scarce pasture and water resources.

3.4.3 Energy Access

The major sources of lighting energy in Haj Aden are solar, lantern and tin. The proposed project area however is not yet connected to the electrical grid, the main source of lighting being Solar power. The major sources of cooking energy in the locality include paraffin, firewood and charcoal. Firewood and charcoal are the commonly used cooking fuel in the area.

3.4.4 Water and Sanitation

Abakaile ward lies in the semi-arid and arid zones with mean annual precipitation being approximately 500 mm/year implying limited access to clean water. The locality does not have a reliable source of clean water with the main source of water being a salty borehole located 25 km away, which is inadequate and unsustainable, seasonal rivers, sand dams, and water pans far away from the project area.

4 NATIONAL POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

4.1 General Overview

This chapter looks at the policy, legal and institutional framework that governs environmental and social management of the proposed Haji Aden water pan project.

4.2 Policy Framework

4.2.1 Kenya Constitution 2010

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

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

4.2.2 Vision 2030

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

The implementation of the proposed water project is an effort to increase agricultural productivity investing in water for irrigation and livestock.

4.2.3 National Gender and Development Policy, 2000

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

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

4.2.4 Policy on Gender and Sexual Based Violence 2017

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

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

4.2.5 The National Environmental Sanitation and Hygiene Policy-2016-2030

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

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

Under Policy Strategy # 2: assuring clean and healthy environment free from public nuisances, it demands adequate systems for managing wastewater treatment and seeks the protection of wetlands and water courses under threat from indiscriminate disposal of waste through provision of adequate targeted services in areas close.

The proposed project already covers this through the initiative to construct new sanitation facilities at the water pan to avoid contamination of the water source.
The water pan also contributes towards achievement of this policy through provision of safe water to area residents for livestock and domestic consumption.

4.2.6 National Food and Nutrition Security Policy (NFSP)

It is the policy of the Government that all Kenyans should enjoy at all times safe food and water in sufficient quantity and quality to satisfy their nutritional needs for optimal health. Access to food and safe water is linked to national security, development and contributor to rural income. The lack thereof water is seen as prohibitive to food security, thus

government pledge to promote and support sustainable water management systems and investment in infrastructure, including water storage facilities.

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

4.2.7 The BETA Agenda

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

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

4.2.8 National Environment Policy (NEP) 2013

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

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

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

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

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

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

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

4.2.10 Kenya National Youth Policy 2006

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

The proposed Water pan development Project will provide direct employment to the youth as required by the Policy. The Youth Employment Programme will be used in the implementation of the ISLMP in the Haji Aden watershed.

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

The National Water Policy of Kenya was developed in 1999 as the National Policy on Water Resources Management and Development (NWP 1999) and was amended in 2012 (draft still). The NWP 1999 aims to achieve sustainable development and management of the water sector by providing a framework and policy direction for the sector: Treat water as a social and economic good; Preserve, conserve and protect all available water resources and allocate it in a sustainable, rational and economical way; Supply of water of good quality and in sufficient quantities to meet the various water needs including poverty alleviation, while ensuring safe disposal of wastewater and environmental protection etc.

Construction of Haji Aden water pan is an initiative towards Water Resources conservation and meeting government's obligation towards supply of water of good quality and quantities to its citizens for poverty alleviation.

4.2.12 The National Occupational Safety and Health Policy, 2012

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

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

4.2.13 National Land Policy

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

The land in use is classified as community and reserved for purposes of the water pan. Construction of the pan ensures the land is put into productive use.

4.2.14 Garissa County HIV and AIDS Strategic Plan 2016/2019

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

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

4.3 Relevant Legislative Framework

4.3.1 Environmental Management and Coordination Act (EMCA) 1999

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

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

4.3.1.1 EMCA (Waste Management Regulations 2006)

This regulation gives guidelines on both operational and administrative activities that are used in handling, packaging, treatment, condition, storage, and disposal of waste and is implemented by NEMA. It prohibits anyone from disposing of any waste on any part of

the environment except in designated waste receptacle or facility provided by the relevant authority which may be legitimate dumpsites or landfills. Since the proposed project will generate waste in form of waste soils and other solid wastes this act provides for the waste generator to be responsible for the collection, segregation at source and proper disposal of their wastes.

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

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

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

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

4.3.1.3 EMCA (Water Quality) Regulations, 2006

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

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

4.3.1.4 EMCA (Air Quality) Regulations, 2008.

The objective of these regulations is to provide for prevention, control, and abatement of air pollution to ensure clean and healthy ambient air. The regulations provide for compliance with emission standards for various sources of air pollution including mobile sources (e.g. motor vehicles) and stationary sources (e.g. industries) as outlined in the Environmental Management and Coordination Act of 1999.

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

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

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

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

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

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

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

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

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

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

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

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

4.3.2.1 Water Resources Management (Water) Rules 2006

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

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

4.3.3 The Public Health Act (Cap. 242)

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

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

4.3.4 The Physical Planning and Land Use Planning Act, 2019

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

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

4.3.5 Penal Code (Cap. 63)

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

The proponent in this SPR has identified all the relevant legislations in the proposed water pan upgrading project and demonstrated compliance and on how further compliance will be attained.

4.3.6 The Occupational Health and Safety Act, 2007

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

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

4.3.6.1 Fire Risk Reduction Rules, 2007

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

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

4.3.6.2 Medical Examination Rules of 2005

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

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

4.3.7 Employment Act, 2007

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

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

4.3.8 Work injury benefits Act, 2007

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

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

4.3.9 National Construction Authority Act (2011)

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

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

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

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

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

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

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

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

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

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

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

4.3.11 The National Museums and Heritage Act 2006

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

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

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

4.3.12 Malaria Prevention Act (CAP 246)

Article **23.** (1) of the Act states unless with the written consent of a health authority, a person shall not, within an area subject to the control of a health authority— *(a)* build or maintain a dam or other construction so as to obstruct the flow of water into or out of a drain under the control of the health authority; *(b)* alter the level of water so as to reduce the flow of water; or *(c)* construct a step, bridge or platform over a drain under the control of a health authority. 24. (1) A person shall not, within an area subject to the control of a health authority, plant trees or cultivate land in such a manner as is likely, in the opinion of a health authority, to obstruct the flow of water in, into or out of a drain or culvert under the control of a health authority.

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

4.3.13 County Government Act No. 17 of 2012

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

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

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

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

4.3.14 Land Act 2012

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

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

The water pan is constructed located on a land parcel that is categorized as community land held in trust by the County Government of Garissa and therefore no land acquisition is anticipated.

4.3.15 Energy Act 2019

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

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

4.3.16 The Standards Act CAP 496

This Act promotes the standardization of the specification of commodities, and provides for the standardization of commodities and codes of practice to ensure public health and

safety. It establishes the Kenya Bureau of Standards (KEBS) and defines its functions as related to:

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

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

4.3.17 Climate Change Act number 11 of 2016

An act for the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development. It requires national and county governments to mainstream climate change responses into development planning, decision making and implementation and to build resilience and enhance adaptive capacity to the impacts of climate change. In this it pushes for mainstream intergenerational and gender equity in all aspects of climate change responses.

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

4.3.18 HIV and AIDS Prevention and Control Act 2011

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

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

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

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

4.4 Institutional Framework

4.4.1 County Government of Garissa

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

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

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

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

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

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

4.4.3 African Development Bank (AfDB)

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

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

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

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

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

4.4.4 Water Resources Authority (WRA)

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

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

4.4.5 Water Resource Users Association (WRUA)

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

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

4.4.6 National Environment Management Authority NEMA

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

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

4.4.7 Department of Occupational Health and safety (DOSH)

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

4.4.8 National Environmental Tribunal

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

4.4.9 Land and Environment Court

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

4.5 African Development Bank Environmental and Social Framework (ESF)

The African Development Bank (AfDB) Environmental and Social Framework (ESF) offers a structured and comprehensive approach to managing environmental and social risks in development projects. The Proposed Construction of the Haji Aden Community Water Pan in Garissa County falls under the category of rural water infrastructure development

an activity that must comply with both Kenya's Environmental Management and Coordination Act (EMCA), Cap 387, and the AfDB's Integrated Safeguards System (ISS). This framework is essential for ensuring that the project is not only technically feasible and financially sound, but also environmentally sustainable, socially inclusive, and responsive to the needs and vulnerabilities of the local community.

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

4.5.1 OS 1: Environmental and Social Assessment

Relevance:

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

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

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

Relevance:

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

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

4.5.3 OS 3: Biodiversity and Ecosystem Services

Relevance:

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

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

4.5.4 OS 4: Pollution Prevention and Resource Efficiency

Relevance:

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

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

4.5.5 OS 5: Labour Conditions, Health and Safety

Relevance:

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

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

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

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

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

4.6 International Conventions and Treaties

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

4.6.1 Conservation of Biological Diversity (CBD) Regulations 2006

These regulations are described in Legal Notice No. 160 of the Kenya Gazette Supplement No. 84 of December 2006. These Regulations apply to the conservation of biodiversity which includes Conservation of threatened species, Inventory, and monitoring of BD and protection of environmentally significant areas, access to genetic resources, benefit-sharing and offenses and penalties.

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

4.6.2 United Nations Convention to Combat Desertification, 1994

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

The proposed SLM practices in the Haji Aden watershed, tree nursery establishment and revegetation in this SPR by the proponent will contribute to the goal of this Convention.

4.6.3 Sustainable Development Goals (SDGs)

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

Through this SPR the Proponent has shown that Haji Aden Water pan water project will contribute to improvement in food and nutrition security, ensure readily availability of fresh water and improvement in sanitation through the proposed construction of latrines in the project site.

5 ANALYSIS OF PROPOSED PROJECT ALTERNATIVES

5.1 Introduction

Evaluating alternative options is a key step in environmental planning to ensure that the selected project intervention is socially acceptable, technically feasible, economically viable, and environmentally sustainable. This section outlines the various project alternatives considered for addressing the acute water scarcity in Haji Aden Village, Garissa County. The analysis includes location alternatives and possible alternative water sources that were assessed before selecting the proposed construction of the Haji Aden Community Water Pan. The final site and intervention were selected through a participatory and evidence-based process involving the local community, County Government officials, and technical experts under the BREFONS County Coordinating Unit (CCU).

5.2 Alternative Location

Alternative locations were considered within Dadaab Sub County. However, Haji Aden Village was prioritized through a participatory planning process due to its extreme water scarcity, long distances to alternative water sources, and increasing population pressure. Nearby settlements such as Hargabul and Seretho, located approximately 25 km away, were considered but deprioritized due to their relatively better proximity to existing water sources.

The selected site in Haji Aden was further validated through technical assessments, including topographical suitability and runoff potential, ensuring the water pan would effectively harvest and retain surface runoff. The site's centrality to the affected community and proximity to livestock grazing zones also supported its selection.

5.3 Alternative Water Sources

Several water supply options were explored to address the water needs of the Haji Aden community. This included groundwater development, sourcing water from external locations, and rainwater harvesting through roof catchments. Each option was evaluated for feasibility, sustainability, and suitability in the local context.

5.3.1 Exploitation of groundwater

The community currently has access to one borehole drilled in 2022 under the World Bank-funded Dr. DIP project. However, hydrogeological assessments have confirmed that the borehole yields saline water, making it unsuitable for human consumption. It is presently used only for livestock watering. There have been adverse health effects associated with this water source, including a reported incident of a pregnant woman falling ill after consumption, underscoring the unsuitability of further groundwater

exploitation in this area. In addition, drilling new boreholes would involve high costs and risks without a guarantee of improved water quality.

5.3.2 Source water from elsewhere

Water trucking from distant locations such as the Kulan Water Pan, located near the local MP's office, has been the temporary solution. However, the distance and cost make this approach unsustainable. Some residents even trek to the Tana River to fetch water an extremely risky endeavour due to the presence of crocodiles and the long distance involved. This option exposes vulnerable community members to safety hazards and places an immense time and financial burden on households, particularly women and children.

5.3.3 Roof water Catchment

Rainwater harvesting through roof catchments was also considered. However, low annual rainfall, coupled with the lack of adequate roofing infrastructure in most homes, makes this option impractical and unreliable. The quantity of water that could be harvested would be insufficient to meet the domestic and livestock needs of over 80 households, especially during dry periods. As such, roof water catchment was not considered a viable standalone solution.

5.4 The No Project Alternative

If the water pan is not constructed, the community will continue relying on expensive water trucking or long-distance donkey transport. This will sustain poor hygiene conditions, limit agricultural opportunities, and maintain the existing cycle of poverty and water stress. The 'No Project' option would result in continued hardship and lost development potential for Haji Aden Village.

5.5 Construction of the existing the Water Pan

The proposed construction of the Haji Aden Community Water Pan emerged as the most viable, sustainable, and community-supported option after extensive stakeholder consultations and technical evaluations. This intervention directly addresses the critical water shortages affecting Haji Aden Village and provides a long-term solution that aligns with the objectives of the BREFONS Kenya program, particularly in strengthening community resilience and food security.

The water pan will be designed to collect and store surface runoff during rainy seasons for use throughout the year. The selected site has undergone topographical and hydrological assessments, confirming its suitability for maximum runoff capture, water retention, and structural stability. The pan will be constructed using environmentally sound methods, and will be appropriately sized to meet the needs of a growing population, currently

comprising over 80 households and a significant number of livestock.

5.5.1 Alternatives construction method- manual vs machines

This option considered the use of manual labour in the construction of the water pan. The choice is not considered to be feasible as it would require a very large workforce to excavate the water pan of the proposed capacity **(50,000m³)** to reduce the number of man hours and the duration to complete the work. The safety of the water pan will not be guaranteed due to the limitation of human labour and such a large work concentrated in one place will result in the degradation of the environment that is besides increased cases of communicable diseases. The use of machinery is therefore, considered as a suitable alternative in terms of efficiency, effectiveness, quality and timelines of completing the work. However, use of human labour will be necessary particularly for project auxiliaries such as construction of water trough, latrine, installation of the water pump and solar panels among others.

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

This involves allowing the community and the livestock to obtain water directly from the water pan. Direct fetching from the water pan was found unsuitable as it would result in the contamination and pollution of water and erosion and destruction of the water pan walls and eventual breakage.

5.5.3 Alternative Construction Materials

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

Compacted Soil and Clay Liners

One of the most commonly used materials for lining water pans in arid and semi-arid regions is compacted soil, particularly clay-rich soils, due to their low permeability and availability in many rural areas. Preliminary assessments suggest that parts of Garissa County may contain natural clay deposits, though the specific presence and suitability of such materials within Haji Aden Village would require confirmation through localized geotechnical or geological surveys.

If suitable clay is identified locally, it would serve as a cost-effective and technically appropriate option for lining the base and embankments of the water pan, reducing seepage losses and extending the useful life of the reservoir. Similarly, clay-rich local soils,

if properly tested and compacted, could serve as effective natural liners, eliminating the need for imported synthetic materials.

Rock Materials for Riprap and Gabions

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

Concrete Components

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

Geomembrane Liners

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

Material Selection Considerations

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

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

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

6 PUBLIC PARTICIPATION & STAKEHOLDER CONSULTATIONS

6.1 Introduction

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

6.2 Objectives

The key objectives of the consultation and public participation for proposed Construction of Haji Aden Water Pan Sub Project was to:

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

6.3 Methodology

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

6.3.1 Public Consultation Questionnaires

ESIA questionnaires were administered, to gather information from key stakeholder and the members of the public. This was done using structured questionnaires to assess the environmental and socio-economic views of the respondents. A total of **10 questionnaires** were administered in the project area. Samples of filled questionnaires administered in the project area are appended to this report (***Appendix I***).

6.3.2 Key Informant Interviews

Key stakeholder interviews and consultations were conducted on the **20th March 2025.** The key stakeholder engagements were conducted to foster better and mutual understanding of public concerns as well as incorporate key stakeholders' opinions to this report.

6.3.3 Public Consultation Meetings

ESIA questionnaires were administered, to gather information from stakeholders and the members of the public. This was done using structured questionnaires to assess the environmental and socio-economic views of the respondents. A total of **10 questionnaires** were administered in the project area. Filled questionnaires administered in the project area are appended to this report *(Appendix I).* In seeking the views of the key stakeholders, and any other would be affected/interested parties, the consultant organized a consultative meeting targeting mainly **Haji Aden Water Pan Sub Project Members** and community members surrounding the Proposed Construction of the Haji Aden Water Pan sub project comprised of the elderly, women, youth, people with special needs (Vulnerable and Marginalized groups) and the local administration, were in attendance during the meetings that took place on **20th March, 2025**. The meeting was used to publicize the proposed **Construction of Haji Aden Water Pan Sub Project** and the anticipated effects and benefits. Prior to the meeting, a stakeholder mapping was carried out to identify key stakeholders to be invited for the meeting. Stakeholders that were directly affected by the proposed project were critically analyzed in consultation with the proponent.

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

Plate 6:1: The community member filling public questionnaires for the Proposed Water Pan.

Plate 6:2: The ESIA Lead expert explaining the project impacts to the community

6.4 Consultation and Disclosure Outputs

The appendices present the information on the public consultations undertaken under the environmental impact assessment for the Proposed Construction of Haji Aden Water Pan Sub Project. This information includes selected responses as detailed in the minutes (***Appendix II***). It was noted that members lauded the project and were eager to see the start of the project. However, there were a few areas that the members sought clarity. A summary of the key concerns raised by the participants is provided in table 6-1 below:

Key Issues from Public Participation Forum (Baraza)

Table 6:1: Summary of Issues Raised by the Community and Stakeholders and Response

KEY ISSUE	QUESTIONS FROM THE COMMUNITY	RESPONSE FROM THE CONSULTANT TEAM
Need for Piping and Water Kiosk	The community expressed a need for piping and a water kiosk to improve water accessibility.	• The technical team confirmed that indeed the project BoQs include the construction of a water kiosk to enhance water accessibility for drinking and domestic use.
Need for Water for Livestock	The community highlighted the need for adequate water supply for livestock alongside for domestic use.	• The technical team acknowledged the importance of water for livestock and confirmed that the BoQs include the installation of cattle troughs to ensure livestock easily get access to the water.

Toilets construction should consider their religion and cultural beliefs	Based on community's religion and cultural beliefs the community requested that toilets be constructed far apart.	• The technical team assured that indeed their inputs and recommendations will be factored in to guide on the toilet constructions.
Vandalism Challenges	The community raised concerns about vandalism of water infrastructure, which could affect reliability and safety of the water storage.	• The technical team acknowledged the issue of vandalism and recommended implementing security measures to protect water infrastructure. • Installing fencing, lighting, and surveillance around critical water facilities to deter vandals was suggested. Already the BoQ had a fencing component. • Engaging the community in safeguarding the infrastructure by reporting suspicious activities and participating in community watch programs was also emphasized. • Educating the community on the negative impacts of vandalism and promoting a sense of ownership and responsibility towards the water facilities was recommended
Water Depletion	The community was concerned about depletion of the water especially during the dry periods.	• The technical team responded that there will be need for the community to be trained and advised on proper water regulation to avoid over abstraction.
Schedule Timings for Drinking Water	The community requested scheduled timings for drinking water to ensure fair distribution and access for both humans and animals.	• The technical team recommended implementing a schedule for water distribution to ensure equitable access for all users, including humans and livestock. • Communicating the schedule clearly to the community and making necessary adjustments based on feedback and usage patterns was suggested.

		Encouraging community involvement in monitoring and managing the schedule to ensure fairness and efficiency was also emphasized.
Leadership challenges and possible conflicts	It was also reported that there is likely to emerge conflicts from leadership and management regarding use of resources.	• The technical team noted that the area under irrigation will be smaller and may not accommodate all members at the same time. They also took cognizance of the fact that resource management can be a source of conflict among members. The team pointed that the capacity building on the management committee will be continuous on financial management, procurement and maintenance. They also urged members to ensure active participation through bi-annual or annual meetings to discuss progress made and way forward.
Gender-Based Violence (GBV)	Concerns were raised about the potential for increased gender-based violence (GBV) in the community due to changes brought about by the water pan project.	• The technical team acknowledged the seriousness of GBV and recommended implementing comprehensive GBV prevention and response measures as part of the project. • Collaborating with local NGOs and community organizations to provide education and awareness programs on GBV prevention was suggested. • Ensuring that project staff and contractors are trained on GBV awareness and prevention, and adopting a zero-tolerance policy towards GBV within the project was also recommended.
Child labor	Concerns were raised about the potential for child labor exploitation in the construction and operation of the water pan project.	• The technical team recognized the importance of preventing child labor and recommended strict adherence to national and international labor laws prohibiting child labor. • Implementing monitoring and enforcement mechanisms to ensure that no child labor is used in any phase of the project was suggested.

		Conducting regular inspections and audits to verify compliance with labor laws and standards was emphasized. Providing educational support and opportunities for children to ensure they remain in school and do not engage in labor activities was also recommended.

6.5 Salient Issues

6.5.1 Opinion on Project Implementation

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

6.6 *Anticipated Impacts*

6.6.1 Positive Impacts

Positive impacts identified by stakeholders include the following:

- **Community Empowerment:** With a reliable water source, the community can focus on other developmental activities, such as education and entrepreneurship, leading to overall community empowerment and development.
- **Reduced distance to water source:** The nearest fresh water source currently serving the community is located 15 km away therefore the proposed water pan will greatly reduce the distance the community members have to travel to seek water for domestic use thereby creating convenience.
- **Improved health and hygiene:** The water pan will provide sufficient water to enable the residents perform cleaning duties consistently and also obtain clean water for drinking and cooking.
- **Economic Development:** Sufficient water availability will help stimulate economic growth by enhancing different farming activities such as crop farming, livestock farming that would in turn contribute to the development of Haji Aden Village.
- **Job Creation:** The project will likely create jobs during the construction and maintenance phases, boosting local employment and economic activity.
- **Community Resilience:** Access to a reliable water source would enhance the resilience of Haji Aden Village, enabling better adaptation to arid conditions and supporting the overall well-being of the community.

- **Soil erosion control:** By slowing down run off and capturing rainwater, there will be a reduction in soil erosion around the region thereby preserving soil quality.

6.6.2 Anticipated Negative Impacts

Some of the negative impacts identified include the following:

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

6.7 Suggestions and comments from public consultations

- Form a functional and registered water users' association with clear roles and responsibilities to ensure effective management and sustainability.
- Implement strict environmental and safety protocols during construction and operation phases to mitigate negative impacts.
- Establish long-term measures to prevent direct animal access to the water pan, such as constructing water troughs.
- Foster community awareness and participation in project oversight and governance to enhance ownership and sustainability.
- Jobs opportunities that will arise during the construction of the water pan project particularly unskilled labour should be reserved for the residents of the project areas.
- Ensure the workers/employees of the proposed project are insured through WIBA for adequate compensation due to injury while at work.
- The proponent and the contactor should involve local administration during the construction phase of the project. Liaison with the community should also continue during construction work and initial operation of the project
- Construction work should strictly observe standards of Occupational Health and Safety including the following;
    - Usage of appropriate safety gear and equipment by construction workers
    - Erection of safety signage along the construction route

    - Provision of sanitation facilities, clean water, and food to construction workers
- The contractor should also strive to use high-quality construction materials as detailed in the design
- Establish a community advisory committee.
- Enforce safety protocols and provide regular project updates.

7 ANTICIPATED IMPACTS AND MITIGATION MEASURES

7.1 Preamble

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

7.2 Positive Environmental and Social Impacts during construction

7.2.1 Employment Creation

The project will create employment opportunities in the construction phase for both skilled and unskilled and casual and contractual work. In the construction works for the catchment youths will be engaged through the youth employment programme in the project. Women will have the opportunity to supply foodstuffs to the workers.

7.2.2 Market for Construction Materials

The construction works will provide market for locally available construction materials such as cement, sand, timber, and steel, building stones and fencing materials.

7.2.3 Increase in Government Revenue

The implementation of the sub project will result in increased revenue for the county and national governments through levies, taxes and cess on the purchase of materials during construction phase.

7.3 Negative Environmental Impacts and Mitigation during the Construction Phase

7.3.1 Temporary Disruption of Land Use and Access

During the construction of the new water pan, access to portions of community land designated for the project may be temporarily restricted. This may affect normal grazing patterns, footpaths, or other communal uses of the land. Although this impact is short-term, it may cause inconvenience or dissatisfaction among community members if not properly managed.

The proposed **mitigation** measures will include:

- **Advance sensitization** of the community through barazas and the local administration to inform them of the planned works, timelines, and any temporary access restrictions.
- **Clear demarcation** of the construction zone to prevent unnecessary interference with unaffected areas.
- **Provision of alternative routes or access points** for people and livestock if existing paths or grazing areas are temporarily blocked.

- **Timely execution of construction activities** to minimize the duration of disruption.
- **Community liaison personnel** to be available on-site to address any arising concerns during the construction phase.

This approach ensures that the community remains informed, engaged, and supportive throughout the construction process, reducing the likelihood of conflict or resentment.

7.3.2 Disturbance of Vegetation and biodiversity

Site clearance will result in the removal of vegetation, pasture and biodiversity losses. The construction of the water pan will increase irrigated land from 2 to 4 acres.

Mitigation measures

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

7.3.3 Soil erosion

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

Mitigation measure

- Contractor to avoid construction during the wet season.
- Contractor to limit excavation to the marked boundaries of the project site.
- Contractor to ensure proper compaction at recommended soil moisture where required.
- Contractor to provide designated routes for vehicles.
- Where possible the contractor to exercise selective removal of mature, indigenous trees.
- Compensatory planting of trees or other appropriate vegetation after construction
- Sensitization of construction workforce on environmental and ecological conservation and protection.

7.3.4 Noise and Vibration Generation

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

Proposed mitigation and management measures.

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

7.3.5 Air pollution (Motor vehicle emissions and dust generation)

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

Mitigation measures

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

7.3.6 Oil spills

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

Mitigation measures

- Proper maintenance of vehicles and other equipment (using petroleum products) to avoid fuels and lubricants spills at the project site.

- The contractor should properly handle, store, and dispose off oils and greases and their wastes during construction by ensuring that servicing is strictly done at designated servicing yard or external petroleum stations.
- Site staff to be sensitized on safety procedures for fuel storage and re-fueling should be well understood and implemented by site staff.

7.3.7 Solid waste generation and accumulation

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

Mitigation measures

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

7.3.8 Earth Excavated material & desilted silt

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

Mitigation measures

- Contractor to dump unused excavated materials and debris in designated places as directed by the supervising engineer.
- Contractor to use excavated soil for the water pan wall/embankment.
- Excavated silt can be incorporated with compost for use as potting media in the tree nursery.

7.4 Negative Socio-economic impacts in the construction phase.

7.4.1 Occupational Health and Safety (OHS)

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

Mitigation measures

- The sites to be protected or fenced off from unauthorized intrusions and warning signs; barricades should be properly displayed and strictly adhered to.

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

7.4.2 Risk of Accidents to the community

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

Mitigation measures

- Contractor to sensitize the community on the project and the project period and what caution to be taken by the community. Restricted access to the construction site for community members unless where necessary.
- Contractor to employ qualified drivers.
- Drivers to be instructed to observe required speed limits.
- Installation of warning sign boards at the construction site and identified risk areas.

7.4.3 Increased exposure to transmissible diseases including HIV/AIDS

7.4.3.1 Increase in incidences of HIV/AIDS and STIs

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

Mitigation measures

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

- Contractor to provide standard quality condoms at the construction site during the construction period.

7.4.4 Labour risks including labour influx

The excavation work for the proposed water pan will be largely mechanized, while construction of auxiliary structures such as water troughs, fencing, and latrines will primarily rely on local labour. However, the potential influx of workers from nearby towns such as Dadaab could lead to increased social tensions, illicit behaviour, or perceptions of insecurity within the local community. Risks may include theft, physical assaults, substance abuse, and commercial sex work.

Mitigation measures

- The proponent will ensure full compliance with Kenya's national labour laws and the African Development Bank's environmental and social safeguards, particularly Operational Safeguard 5 (Labour Conditions, Health and Safety), by incorporating these provisions into the Procurement and Contract Agreement for implementation by the contractor.
- All workers will be sensitized on the AfDB Code of Conduct, national labour standards, and community engagement principles to ensure responsible behaviour throughout the project.
- Local community members will be prioritized for casual and unskilled labour opportunities to minimize labour influx and enhance local ownership of the project.
- The contractor will conduct pre-employment orientation and continuous awareness training on acceptable conduct and project expectations.
- A detailed registry of all workers will be maintained onsite, documenting their identity, role, and origin, to ensure traceability and accountability.
- The project will support training of the Project Management Committee (PMC), Site Advisory Implementation Committee (SAIC), County Environmental and Social Safeguards Officers (CESSCOs), and promote community policing measures to monitor and manage labour-related risks effectively.

7.4.5 Risk of Social Conflict

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

Mitigation measures

- The proponent adherence to national labour code and AfBD policies through incorporating the same in the Procurement and Contract Agreement document for implementation by the contractor.

- Contractor to sensitize the workers on code of conduct (COC)
- Develop and implement local hiring rules in consultation and partnership with the local community.
- Train workers and the project management committee and rank members on conflict management and resolution

7.4.6 Child Labor and School Dropout

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

Mitigation measures

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

7.4.7 Gender Based Violence (GBV)

This impact is triggered during Project Construction Phase when the Contractor fails to comply with gender inclusivity requirements in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule. Failure to protect Human Risk Areas Associated with, Disadvantaged Groups, interfering with Participation Rights, and interfering with Labour Rights may also result in GBV.

Mitigation Measures of Human Rights and Gender Requirements are.

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

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

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

Mitigation Measures to Risk of SEA include.

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

7.5 Positive Environmental and Social Impacts during operation phase

7.5.1 Soil Conservation in Project Area.

The construction of the Haji Aden water pan will support upstream soil conservation measures by acting as a draining point for cut-off drains constructed in the watershed.

7.5.2 Replenish Groundwater

The storage of a large volume of water in the pan will replenish groundwater in the dry period in the project area.

7.5.3 Flood Control

The water pan will be a safe discharge of excess flood water from the catchment. This will reduce flooding on the downstream farms thus livelihoods and preventing losses.

7.5.4 Improved Livestock production & Profitability

Supply of water for livestock farming will lead to increase in livestock numbers and productivity thus raising farmers income levels.

7.5.5 Increased Drought Resilience

Considering the size of the water pan it will be able to hold enough water which will provide a reliable water supply throughout the year. This will increase the community resilience to drought.

7.5.6 Improved Food Security

Availability of water will contribute to livestock productivity. This will enhance food security and nutrition beside income through local sale.

7.5.7 Livelihood Diversification

The proposed project will enhance livelihood diversification e.g. to beekeeping, poultry keeping, as a result of water supply. This will be possible through the increased volume of water in the water pan. Diversification will contribute towards employment creation, income generation and food security in the project area.

7.5.8 Improved Public Hygiene

The proposed construction of sanitary facilities latrines in the project and fencing of the Haji Aden water pan will mean less contamination and pollution of the water and the environment. All this will result in improved sanitation and public hygiene in the area.

7.5.9 Reduction in Water Borne Diseases

The project area is ASAL. With appropriate water treatment before use the water pan provides a source of safe water for livestock and some limited domestic uses. This is likely to lead to improved personal and public hygiene. Improvement in public hygiene will mean reduced disease incidences and disease burden. The trainings and continuous sensitizations expected to take place during operation stage by water department will enhance the curbing of waterborne diseases. Provision of communal watering points and livestock troughs will control water pollution resulting from direct fetching of water from the water pan.

7.5.10 Increased Household Income

Construction of the water pan will ensure there is reliable water for crop farming and livestock use. This will result in increased agricultural productivity to households resulting in high incomes at the household level. This will also lead to lowering of poverty in the community.

7.6 Negative Environmental and Mitigation Measures during the Operation phase

7.6.1 Surface and Ground Water Pollution

Water pollution may be from several sources. Pollution of the water could make the water unsuitable for the proposed use in the project. This could be from: watering of animals directly from the water pan, unattended oil spillage during the construction

period, poor farming technologies upstream, use of agrochemicals and destruction of catchment. Leaching of agrochemicals would result to ground water pollution.

Mitigation measures include the following.

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

7.6.2 Soil Erosion and Siltation of the Water Pan

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

Mitigation measures

- Construction of silt traps along the inlet water course as will be guided by the supervising engineer (see annex 5 on Bill of Quantities)
- Regular maintenance of the check dam/silt traps by the community
- The embankment to be grown with suitable grass as outlined in the design plan.
- The proponent to ensure the implementation of the developed ***integrated sustainable land management (ISLM)*** plan.
- The catchment community to be sensitized on the ISLM & to be trained on farm SLM practices e.g. terracing, minimal tillage, agroforestry crop rotation, intercropping.
- Regular desilting should be undertaken (removal of silt from the reservoir using manual labour can be periodically organized during the dry season).
- The proponent to consider piping water to other sites in future to avoid animal concentration and overgrazing in the project area.
- Sensitize the community on appropriate stock rate.

7.6.3 Water Pan Breaking Its Walls and Associated Risks

Above normal rains over a longer period, damage of the water pan walls and lack of maintenance could result in the water pan walls breaking and suddenly discharging its

water. The outcome may be destruction of property, land degradation and risk to the people living downstream.

Mitigation measures

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

7.6.4 Solid Waste Generation

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

Mitigation measures

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

7.6.5 Risk of Drowning

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

Mitigation measures

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

7.6.6 Impacts on River Regime and Downstream Users

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

7.7 Negative Social and Economic Impacts

7.7.1 Outbreak of Livestock Diseases

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

Mitigation measures

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

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

The presence of standing water provides good breeding ground for disease vectors especially with malaria and increase in schistosomiasis. Further, due to water scarcity in the area, the community may be tempted to use the water pan water for drinking purposes without treatment. The two scenarios carries possibility of increasing diseases

given malaria prevalence is at 46.9% in the county while diarrhoea and typhoid are at 7.6% (KNBS, 2018).

Mitigation measures

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

7.7.3 Occupational Health and Safety Concerns

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

Proposed mitigation

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

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

7.7.4 Water use related conflict

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

Mitigation measures

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

7.7.5 Poor leadership and management problems

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

Mitigation includes;

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

7.7.6 Child labour and school drop out

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

Mitigation measure

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

7.8 Decommissioning phase

The proposed Haji Aden water pan project is expected to operate for 20 years. After this period depending on the prevailing situation of the time, decommissioning of the project could be undertaken. This could be due to various reasons such as a new bigger source of water being developed in the area therefore, the water pan being abandoned, or the water pan becoming completely silted or creating a risk to the community.

7.8.1 Positive Environmental and Social Impacts

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

7.8.2 Negative Environmental and Social Impacts

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

7.8.3 Mitigation Measures for the Decommissioning of the Water pan

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

8 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

8.1 Introduction

The project proponent acknowledges that implementing the proposed activities will have various effects on the natural environment, as well as on the health, safety, and socio-economic well-being of the Haji Aden Water Pan community and surrounding stakeholders. Therefore, the main goal is to minimize any negative impacts while maximizing the project's benefits. To achieve this, an Environmental and Social Management and Monitoring Plan (ESM&MP) has been developed to guide the prevention, reduction, and management of environmental and social risks throughout the project's duration. Given that project conditions may change over time, the ESM&MP has been structured to be flexible and responsive. Periodic updates and reviews are advised to maintain its relevance and ensure effective implementation.

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

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

Table 8:1: Environment and Social Management and Monitoring Plan

Environment/ Social Impact	Proposed Mitigation Measure	Indicator	Responsibility	Means of Verification	Time Frame	Estimated cost (Kshs)
NEGATIVE ENVIRONMETAL IMPACTS IN THE CONSTRUCTION PHASE						
Temporary Disruption of Land Use and Access	• Advance sensitization of the community through barazas and the local administration to inform them of the planned works, timelines, and any temporary access restrictions. • Clear demarcation of the construction zone to prevent unnecessary interference with unaffected areas. • Provision of alternative routes or access points for people and livestock if existing paths or grazing areas are temporarily blocked. • Timely execution of construction activities to minimize the duration of disruption. • Community liaison personnel to be available on-site to address any arising concerns during the construction phase.	• Number of barazas held • Visible site demarcation • Alternative routes provided • Adherence to timelines • Presence of liaison officer and • Complaint records	Contractor Proponent Department of water (Director) CPCU	Meeting minutes and attendance lists; site inspection/photos; site layout map; contractor progress reports; grievance logbook and posted contact info	4 months	**200,000 water trucking**
Disturbance of vegetation	• Site clearance to be limited to the project demarcated area and selective removal of vegetation or trimming of trees to be exercised where possible. • Local community to be allowed to harvest areas of natural vegetation that are to be cleared prior to clearing. • The proponent to support establishment of a community tree nursery for indigenous trees • Compensatory planting of trees or other appropriate vegetation after construction works • Construction workforce to be sensitized on environmental and ecological conservation	• Area cleared of vegetation • Number of tree nursery established. • Number sensitization meetings for workers held	Proponent Supervising engineer/Contractor PMC	M & E reports Engineer's report Photographs	4 months	**150,000** Tree nursery establishment
Soil Erosion	• Contractor to avoid construction during the wet season. • Contractor to limit excavation to the marked boundaries of the project site. • Contractor to ensure proper compaction where required. • Contractor to provide designated routes for vehicles. • Where possible the contractor to exercise selective removal of mature, indigenous trees. • Compensatory planting of trees or other appropriate vegetation after construction • Sensitization of construction workforce on environmental and ecological conservation and protection.	• Time of excavation • Area of land excavated • Designated site for stock pile available • Number of compactions runs made • Marked routes for vehicles available • Number of sensitization meetings held	Contractor/supervising engineer Proponent Dept. of Agriculture Dept. of Environment Community	Engineers' reports Photographs Attendance register Sectoral Field reports CESSCO reports	8 months	**Factored above**

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

NEGATIVE SOCIO-ECONOMIC IMPACTS IN THE CONSTRUCTION PHASE						
Occupational Health and Safety (OHS)	• The sites to be protected or fenced off from unauthorized intrusions and warning signs; barricades should be properly displayed and strictly adhered to. • All workers to be provided with full protective gear (PPEs) and to use them • Workers to be trained on first aid & a fully equipped First Aid Kit provided at site. • The contractor to have Incident and Accident Registers on site for recording of injuries or any OHS incidence. • Contractor to prepare an emergency management and preparedness plan for accident response & avail Emergency contacts for police, ambulance, etc. • Contractor to appoint a qualified health and safety person to manage OSH issues. • Tools and equipment to be placed in a safe place when not in use. • Workers on contract to be insured	• No of Labels and warning signs installed • No of workers using PPEs on use by those involved at the site • No of staff/ workers trained on first-aid • No of First-aid Kits installed No of incidences/ accidents reported • NO. of emergency plan for accident response in place • Emergency contacts at the site • No of persons insured	Contractor/Supervising engineer/work foreman Work foreman Directorate of Occupational Health and Safety (DOSH)	Purchase receipts Reports Attendance register Records of testimonials of drivers	4 months	**50,000**
Risk of Accidents to the community	• Contractor to sensitize the community on the project and the project period and what caution to be taken by the community. • Contractor to employ qualified drivers. • Drivers to be instructed to observe required speed limits. • Installation of warning sign boards at the construction site and identified risk areas.	• Number of drivers instructed • No. of signage in identified risk areas • No. of community sensitizations on project implementation, risks and safety measures	Contractor/Supervising engineer	Photographs Attendance register Site visits	4 months	**15,000**
Increase in incidences of HIV/AIDS and STIs	• Contractor to sensitize workers and community members on HIV/AIDS and other communicable diseases. • Contractor's Health and Safety Management Plan (CHSMP) to be enforced through the Directorate of Occupational Health & Safety (DOSH) • Controlled access to Contractor's Workforce Camps by outsiders. • Contractor to provide standard quality condoms at the construction site during the construction period.	• Number of worker and community sensitized • No of condom dispensing equipment installed • Number of meetings held for workers and community	Contractor Proponent Public Health	Attendance registers Site visits	8 months	**40,000**
Spread of COVID-19 amongst construction workers	• The Contractors will develop SOPs for managing the spread of Covid-19 during project execution in line with the African Development Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions; • Mandatory provision and use of appropriate PPE) shall be required for all project personnel including workers and visitors; • Concentration of more than 15 people in a location to be avoided. • Maintain social distancing of at least 1.5 meters where two or more people gathered, • Subject workers and other people visiting the site	No of SOP(s) developed, No of training material developed, No of PPE purchased and used, No of installed handwashing equipment installed.	All the Project components Supervising Eng. & Contractor(s)	SOPs Project assessment reports Purchase orders/receipts Photos	8 months	**50,000**

	to rapid Covid-19 screening which may include temperature check and other vital signs; • Install hand-washing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings; • Ensure routine sanitization of shared social facilities.					
Labor risks including labor influx	• Local community members will be given priority in employment opportunities, in casual and unskilled labour. • Train the community on the project requirements and product. • Training of PMC, SAIC, CESSCOs and Community policing of the project	• Number of trainings for PMC, SAIC, CESSCOs and Community policing of the project • NO. of community members trained on project requirements	Contractor/ CPCU/	Training reports Workers register local administration report on GBV incidences monitoring, assessment	1 month	**50,000**
Risk of social conflict	• The proponent adherence to national labour code and AfDB policies through incorporating the same in the Procurement and Contract Agreement document for implementation by the contractor. • Contractor to sensitize the workers on code of conduct (COC) • Develop and implement local hiring rules in consultation and partnership with the local community. • Train workers and the project management committee and rank members on conflict management and resolution	• No of tenders with specific clause on AfDB policies such as equality in employment • No of signed code of conduct by the workers • Community user's development plan developed • NO. of PM, SAIC, & administration trained on GBV	Contractor/Works foreman CPCU Local Project management committee	Minutes Reports Attendance registers	1 months	**10,000**
Child labor and school dropout	• The proponent to sensitize the community on national children welfare policies, children's laws and African Development Bank policies on the protection of children and the importance of children being educated. • The Proponent to ensure the Contractor complies with national and AfDB policies and rules on welfare of children. • Control to ensure there is no child labour at the construction. This can be done by using Identification Cards to verify the age of the workers and casuals.	• No. of sensitizations on children welfare • No of registered workers • No of workers who have signed the code of conduct	CPCU	Signed agreements attendance registers copies of ID. Card No. of workers	Construction phase	**10,000**
Gender-based Violence (GBV) at the community level	• The contractor will implement provisions that ensure that GBV at the community level is not triggered by the Project, including: • Effective and on-going community engagement and consultation, particularly with women and girls. • Review of specific project components that are known to heighten GBV risk at the community level. • The contractor shall develop specific plan for mitigating these known risks, e.g. sensitization employment.	• Number of engagements with women & girls • Code of conduct prepared • NO. of GBV risk factor identified • NO. of plans to mitigate risks developed. • NO. of Referral mechanisms in place.	Supervision Consultant GBV Expert Local NGO/CBO	GBV plans Attendance registers GBV action plans	1 year	**100,000**

	• The contractor will ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project implementation.					
Sexual Exploitation and Abuse by project workers against community members	• Proponent to develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. • The SEA action plan will include how the project will ensure necessary steps are in place for: • Prevention of SEA through including Code of Conduct (CoC) and ongoing sensitization of staff on responsibilities related to the COC. • Response to SEA by including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures. • Engagement with the community & development of confidential community-based complaints mechanisms discrete from the standard GRM. • Integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA.	• NO. of SEA Action Plans • NO. of workers signed COC • Number of community members engaged on developing community-based complaint mechanism.	Supervision Consultant GBV Expert	SEA action plan Attendance registers	1 year	**150,000**
NEGATIVE ENVIRONMETAL IMPACTS IN THE OPERATION PHASE						
Surface & Ground water pollution	• The water pan should be fenced as indicated in the BQ and having only one controlled entrance. • The users should draw off water from the designated sites only. • The Contractor to clear the site of all solid wastes, construction materials and any spills after completion of the construction works. • The Proponent to ensure the construction of pit latrines in the site as provided in the BOQ at a safe distance from water sources. • The Proponent to develop and implement (through sensitization of farmers) an ***Integrated Pest Management Plan*** (IPMP) • Proponent to ensure regular monitoring of water quality.	• No of animals drinking from water troughs • No of community members drawing water from communal drawing points constructed • Acreage fenced • NO. of pit latrines constructed • NO. of IPMP developed & implemented • NO. of farmers sensitized on IPMP • Frequency of water quality testing.	Proponent Dept. of Livestock and agricultural officers Proponent Community in catchment area	Designs & BQs Reports Photographs Attendance Registers Training manuals	6 months	**150,000** **IPMP development & implementation.**
Soil erosion & Siltation	• Construction of silt traps along the inlet water course as will be guided by the supervising engineer (see annex 5 on Bill of Quantities) • Regular maintenance of the check dam/silt traps by the community • The embankment to be grown with suitable grass as outlined in the design plan. • The proponent to ensure the implementation of the developed ***integrated sustainable land management (ISLM)*** plan. • The catchment community to be sensitized on the ISLM & to be trained on farm SLM practices e.g. terracing, minimal tillage, agroforestry crop rotation, intercropping.	• No of silt traps constructed along the inlet water course • Acreage of land under catchment management and conservation through SLM • No of trainings on SLM • Area of embankment planted with grass. • NO. of additional cattle troughs. • NO. of community members sensitized on stock rate. • NO. of gabions constructed • Frequency of desiltation.	PMC Proponent Community Director Department of agriculture	Designs & BQs Training manuals Attendance Registers Photographs	8 months	**75,000** **sensitization**

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

	• Employ a person to guard the water pan/through the water users' association (WUA) ensure regular monitoring.					
NEGATIVE SOCIO-ECONOMIC IMPACTS IN OPERATION PHASE						
Outbreak of livestock diseases	• Regular disease surveillance by the veterinary department and community. • Sensitization of the community on disease spread, monitoring and control. • A livestock disease management plan be put in place by the veterinary department to ensure disease incidences are promptly responded to and addressed.	• Number of disease surveillance • No of Sensitization meetings held on disease control • A livestock disease management plan put in place	CPCU	Surveillance reports Training reports Attendance Registers Disease Management Plan	1 year	**100,000**
Human health impacts e.g. Malaria and schistosomiasis	• Sensitize the community on malaria prevention through use of mosquito nets, local and indoor residual spraying and bush clearing near households. • Malaria surveillance programme to be maintained. • Establish community-based health education committee that facilitate malaria control programme facilitated and coordinated through public health department • Sensitize the community on water purification methods.	• No/ Proportion of households with mosquito nets • No of people trained on malaria & water borne diseases control • Record of disease incidence • No of households practicing safety rules	CPCU Department of Public Health	Photographs Attendance Registers	2 weeks	**50,000**
Occupational Health and Safety to use of agricultural chemicals	• Development & implementation of Integrated Pesticide Management Plan (IPMP)	NO. of IPMP developed & implemented	CPCU Proponent Department of Agriculture	Reports	Quarterly	**150,000**
Water use related conflict	• Develop and implement a community users' development plan in consultation and partnership with the local community and existing WRUAs • Formulation of local by-laws to guide the use of water in the project area • Sensitize the community/beneficiaries on efficient water use to avoid wastage. • Raise community awareness on the benefits of the project for more cooperation.	NO. of community water users plan developed & implemented NO. of bylaws developed and implemented NO. of community members educated on water conservation	CPCU Proponent WRA Department of Agriculture / Water	Attendance register Training manual Reports	Quarterly	**75,000**
Poor leadership and management problems	• Training of PMC on water project management, financial management and promotion of accountability & accountability. • Sensitization of project beneficiaries/community members on project management.	NO. of PMC trained NO. of trainings NO. of community members trained on project management.	CPCU Proponent	Attendance register Reports	Quarterly	**50,000**
Child labour and school drop out	• Train village volunteer child monitors to work closely with the office of the chief and the department of children on issues of child protection • Sensitize the community on child protection issues relating to the project.	• NO. of village volunteer's child monitors trained. • NO. of community members trained on child protection.	CPCU Proponent Chief	Attendance register Reports	Quarterly	**25,000**
DECOMMISSIONING PHASE						
Decommissioning Impacts	• Proponent to undertake environmental and social impacts of the proposed decommissioning	Duration of investigation	Proponent	Decommissioning report	1 months	**200,000**

		NO. of Decommissioning Plans ESMP developed		Decommissioning Plan ESMP		
conflict Management	• Proponent to notify all the Project Affected Persons (PAP)	NO. of methods of notification NO. of PAPs notified	Proponent	Notification notice	1 week	**30,000**
TOTAL						**2,235,000**

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

8.2 Environmental and Social Monitoring Programme

8.2.1 Monitoring and Management

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

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

8.2.2 Compliance Monitoring -Pre-construction and Construction phase

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

The project Management Unit will prepare periodic project compliance reports

8.2.3 Compliance Monitoring - Operation Phase Monitoring

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

The financing partner will mount periodic supervision missions.

8.2.4 Effects Monitoring

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

Table 8:2: Monitoring Indicators

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

8.2.5 Audits and Reviews

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

8.3 Water Pan Crisis Action Plan (CAP)

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

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

8.3.1 Emergency Action Plan (EAP)

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

8.3.2 Community Training

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

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

8.4 Risk Assessment

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

Table 8:3: Class of Water Structures

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

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

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

8.5 Water Pan Inspection

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

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

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusion

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

9.2 Recommendations

9.2.1 Implementation

- ✓ It is recommended that the proposed project proponent be allowed to go ahead provided the outlined mitigation measures are implemented as outlined in the ESMMP. The ESMMP will be shared with the Contractor who will implement the Contractor-Specific Environmental and Social Management and monitoring Plan (C-ESMMP).
- ✓ On approval, it is recommended that the proponent should implement the proposed project based on the proposed plans and if alterations are necessary, advice should be sought from the CESSCO and subsequently environmental expert.
- ✓ There is need for rigorous implementation of the Environmental Management and Monitoring Plan which will facilitate the mitigation and/ or prevention of potentially adverse environmental impacts.
- ✓ The proposed ESM&MP should be followed fully by the contractor with the supervision from the proponent. A report on the findings from the monitoring of the ESM&MP right from implementation all through to decommissioning phase submitted quarterly.
- ✓ The mitigation measures proposed should be followed by the proponent as it is highlighted in this ESIA report.
- ✓ The design, construction and operation should be carried out in accordance to the specific report for the proposed project.
- ✓ The proponent to undertake Environmental Impact Assessment Studies for all the proposed borrow pits and areas of construction materials
- ✓ An Environmental Audit be undertaken and submitted to NEMA every year after commissioning of the project to ensure that all the proposed mitigation measures

have been complied with. The social impacts raised during community participation should be followed.

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

9.2.2 Compliance with the Water Quality Regulations

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

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

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

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

REFERENCES

Garissa County. (2023). County Integrated Development Plans (CIDPs) for 2023-2027

Republic of Kenya (1973). The Standards Act Cap 496. Nairobi, Government Printer.

Republic of Kenya (1999). Environmental Management and Co-ordination Act. Nairobi, Government Printer.

Republic of Kenya (1999). National Policy on Water Resources Management and Development - Sessional Paper Number 1 of 1999. Nairobi.

Republic of Kenya (2003). The Environmental (Impact Assessment and Audit) Regulations, 2003. Legal Notice No. 101. Nairobi, Government Printer.

Republic of Kenya (2004). Factories and Other Places of Work (Safety and Health Committees) Rules, 2004. Nairobi, Government Printer.

Republic of Kenya (2005). Factories and Other-Places of Work (Noise Prevention and Control) Rules, 2005. Nairobi, Government Printer.

Republic of Kenya (2005). Factories and Other Places of Work (Medical Examination) Rules, 2005. Nairobi, Government Printer.

Republic of Kenya (2006). Environmental Management and Coordination, (Fossil Fuel Emission Control) Regulations, 2006 (Legislative Supplement No. 41) Legal Notice No. 131. Nairobi, Government Printer.

Republic of Kenya (2006). Environmental Management and Coordination, (Waste Management) Regulations 2006. Legal Notice No. 121. Nairobi, Government Printer.

Republic of Kenya (2006). Environmental Management and Coordination, (Water Quality) Regulations 2006. Legal Notice No. 120. Nairobi, Government Printer.

Republic of Kenya (2006). Kenya National Youth Policy 2006. Nairobi, Government Printer

Republic of Kenya (2006). National Museum & Heritage Act, 2006. Nairobi, Government Printer.

Republic of Kenya (2006). Water Resources Management (Water) Rules 2006. Nairobi, Government Printer.

Republic of Kenya (2007). Employment Act, No. 11 of 2007, and the Employment Act Subsidiary Legislation. Nairobi, Government Printer.

Republic of Kenya (2007). Factories and Other Places of Work (Fire Risk Reduction) Rules, 2007. Nairobi, Government Printer.

Republic of Kenya (2007). Kenya's Vision - 2030. Government Printers, Nairobi.

Republic of Kenya (2007). Occupational Safety and Health Act, 2007. Legal Notice No. 15. Nairobi, Government Printer.

Republic of Kenya (2007). Work Injury Benefits Act (WIBA), 2007 Act No. 13 of 2007. Nairobi, Government Printer.

Republic of Kenya (2009). Building Code. Nairobi, Government Printer.

Republic of Kenya (2009). Environmental Management and Coordination, (Noise and Excessive Vibration Pollution) (Control) Regulations 2009. Legal Notice No. 61. Nairobi, Government Printer.

Republic of Kenya (2009). Sessional Paper No. 3 of 2009 on National Land Policy. Ministry Of Lands. Nairobi.

Republic of Kenya (2010). The Constitution of Kenya 2010. Nairobi, Government Printer.

Republic of Kenya (2011). Children's Act, 2001. Nairobi, Government Printer.

Republic of Kenya (2011). Environment and Land Court Act, No. 19 of 2011. Nairobi, Government Printer.

Republic of Kenya (2011). HIV and AIDS Prevention and Control Act, No 14 of 2011. Nairobi,

Republic of Kenya (2011). National Food and Nutrition Security Policy. Agricultural Sector Coordination Unit (ASCU) Kilimo House, Cathedral Road. Nairobi.

Republic of Kenya (2011). The National Construction Authority Act, 2011. Nairobi, Government Printer.

Republic of Kenya (2012). County Government Act No. 17 of 2012. Nairobi, Government Printer.

Republic of Kenya (2012). Labour Relations Act 2012. Nairobi, Government Printer.

Republic of Kenya (2012). Malaria Prevention Act (CAP 246). Nairobi, Government Printer.

Republic of Kenya (2012). Public Health Act CAP 242. Nairobi, Government Printer

Republic of Kenya (2012). The Land Act, 2012. Nairobi, Government Printer.

Republic of Kenya (2012). The National Land Use Policy (NLUP) - Sessional Paper, No. 1 of 2017 2012. Nairobi.

Republic of Kenya (2012). The National Occupational Safety and Health Policy, 2012. Nairobi.

Republic of Kenya (2013). Environmental Management and Coordination, (Air Quality) Regulations 2013. Legal Notice No. 34. Nairobi, Government Printer.

Republic of Kenya (2014). National policy for prevention and response to gender-based violence, 2014. Nairobi, Government Printer.

Republic of Kenya (2014). Penal Code, CAP. 63. Nairobi, Government Printer.

Republic of Kenya (2015). Environmental Management and Co-ordination (Amendment) Act, 2015. Kenya Gazette Supplement No. 74 (Act No. 5). Nairobi, Government Printer.

Republic of Kenya (2015). Environmental Management and Coordination (Amendment) Act, 2015. Kenya Gazette Supplement No.74. (Nairobi, Government Printer.

Republic of Kenya (2016). Climate change act No. 11 of 2016. Nairobi, Government Printer.

Republic of Kenya (2016). The National Environmental Sanitation and Hygiene Policy-2016-2030. Nairobi, Government Printer.

Republic of Kenya (2016). Water Act, 2016 (No. 43 of 2016). Nairobi, Government Printer.

Republic of Kenya (2017). National Food and Nutrition Security Policy (NFSP). Nairobi.

Republic of Kenya (2017). Sessional Paper, No. 1 of 2017 on National Land Use Policy. Ministry Of Lands and Physical Planning. Nairobi.

Republic of Kenya (2019). Energy Act 2019. Nairobi, Government Printer.

Republic of Kenya (2019). Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019. NEMA legal Notice No. 32. Kenya gazette supplement no. 62. Nairobi, Government Printer.

Republic of Kenya (2019). Environmental Management and Coordination (Amendment) Act, 2019. Amendment of the second schedule. NEMA legal Notice No. 31. Kenya gazette supplement no. 62. Nairobi, Government Printer.

Republic of Kenya (2019). National Gender and Development Policy, 2019. Nairobi, Government Printer.

Republic of Kenya (2019). Physical and Land Use Development Plan Act 2019. Nairobi, Government Printer.

Republic of Kenya (2019). Sexual Offences Act 2016. Nairobi, Government Printer.

Republic of Kenya. (2013). Sessional Paper No. 10 of 2013 on the National Environment Policy. Ministry of Environment Water and Natural Resources October 2013. Nairobi, Government Printer.

APPENDICES

Appendix i	Sample of Filled Public Consultation Questionnaire
Appendix ii	Minutes of Public Consultation Meetings
Appendix iii	List of Attendants for Public Consultation
Appendix iv	NEMA Practicing License (Lead and Associate Expert)
Appendix v	Land Resolution Form / Consent
Appendix vi	Photo Gallery
Appendix vii	Chance Find Procedure
Appendix viii	ESIA Inspection form
Appendix ix	Water Pan Crisis Action Plan (CAP)
Appendix x	Overview of Emergency Action Plan
Appendix xi	Haji Aden Water Pan Drawings and Design

Appendix I: Sample of Filled Public Consultation Questionnaire

MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

STATE DEPARTMENT FOR AGRICULTURE

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

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

Specific Site Activity: ESIA FOR THE PROPOSED HAJI ADEN WATER PAN

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

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

Respondent

Name: ABDI BUTHL GIM

Phone Number: 0724873066

Village: HAJI ADEN Sub-County: DADAAB

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

   - Fresh Water Availability
   - Job creation

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

   Maintenance Cost
   Waterborne diseases

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

   Start the construction soon

Signature/ Thump Print: ....

Date: 18/3/2025

MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

STATE DEPARTMENT FOR AGRICULTURE

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

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

Specific Site Activity:
ESIA FOR THE PROPOSED HAJI ADEN WATER PAN

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

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

Respondent
Name: MOHAMED SADIK
Phone Number: 0743762365
Village: HAJI ADEN Sub-County: Dadaab

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Economic Development
   - Job creation for community Members
   - Availability of water
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Waterborn diseases
   - Vandalism
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**
   Start the contruction soon

Signature/ Thump Print: ....

Date: 18/3/2025

MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

STATE DEPARTMENT FOR AGRICULTURE

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

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

Specific Site Activity:
ESIA FOR THE PROPOSED HAJI ADEN WATER PAN

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

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

Respondent
Name: MOHAMED ALI
Phone Number: 0748292144
Village: HAJI ADEN Sub-County: Dadaab

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Job creation for family Member
   - Water will be available
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Cost of Maintainace
   - Vandalism
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**
   start the Construction procedure

Signature/ Thump Print: ....

Date: 18/3/2025

MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

STATE DEPARTMENT FOR AGRICULTURE

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

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

Specific Site Activity:
ESIA FOR THE PROPOSED HAJI ADEN WATER PAN

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

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

Respondent
Name: HALIMA AHMED
Phone Number:
Village: HAJI ADEN Sub-County:

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

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

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

   Start the construction soon

Signature/ Thump Print:

Date: 18th March 2025

MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

STATE DEPARTMENT FOR AGRICULTURE

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

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

Specific Site Activity:
ESIA for the proposed HAJI ADEN WATER PAN

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

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

Respondent
Name: DAKANE MOHAMED
Phone Number: 0722766816
Village: HAJI ADAN Village Sub-County: Dadaab

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Job opportunity
   - Water Availability
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Waterborne diseases
   - Vandalism
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**
   Start doing the construction soon

Signature/ Thump Print: ....

Date: 18/03/2025

MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

STATE DEPARTMENT FOR AGRICULTURE

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

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

Specific Site Activity: ESIA FOR THE PROPOSED HAJI ADEN WATER PAN

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

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

Respondent

Name: ANTHONY ASEH

Phone Number: 0722899039

Village: HAJI ADEN Sub-County: Dadaab

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

   • Economic growth
   • Job creation
   • plenty water
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?

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

   Start the project soon

Signature/ Thump Print: .....

Date: 18/03/2025

MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

STATE DEPARTMENT FOR AGRICULTURE

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

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

Specific Site Activity:
ESIA FOR THE PROPOSED HAJI ADEN WATER PAN

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

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

Respondent
Name: ALI MOMIN
Phone Number: 0710 714051
Village: HAJI ADEN Sub-County: DADAAB

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Youth will be employed
   - Job opportunities
   - Availability of water
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Vandalism
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**
   Start doing the project soon

Signature/ Thump Print: ...

Date: 18/3/2025

MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

STATE DEPARTMENT FOR AGRICULTURE

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

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

Specific Site Activity: ESIA FOR THE PROPOSED HAJI ADEN WATER PAN

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

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

Respondent

Name: KIYAT IBRA

Phone Number: 0716614993

Village: HAJI ADEN Sub-County: Dadaab

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

   - Availability of water for the community
   - Job Creation
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?

   stealing items

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

   Start the project soon

Signature/ Thump Print: [signature]

Date: 18th March 2025

MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

STATE DEPARTMENT FOR AGRICULTURE

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

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

Specific Site Activity: ESIA FOR THE PROPOSED HAJI ADEN WATER PAN

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

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

Respondent
Name: ABDI OSMAN
Phone Number: 07 25154488
Village: HAJI ADEN Sub-County: Dadaab

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Economic Growth
   - Job Opportunities
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   Construction items might be lost
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**
   Start doing the project soon

Signature/ Thump Print: ...

Date: 18/3/2025

MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

STATE DEPARTMENT FOR AGRICULTURE

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

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

Specific Site Activity:
ESIA FOR THE PROPOSED HAJI ADEN WATER PAN

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

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

Respondent
Name: AHMED OMAR
Phone Number: 0732628801
Village: HAJI ADEN Sub-County: Dadaab

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Employment of Community Members
   - Availability of Water
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Vandalism
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**
   Start the Construction Soon

Signature/ Thump Print:

Date: 18/3/2025

Appendix II: Minutes of Public Consultation Meetings

MINUTES OF THE PUBLIC PARTICIPATION FOR THE PROPOSED HAJI ADEN COMMUNITY WATER PAN AT HAJI ADEN VILLAGE, IN HAGARBUL LOCATION, DADAAB SUB COUNTY, GARISSA COUNTY HELD ON 18TH MARCH, 2025.

PRESENT MEMBERS

List attachment

AGENDA

The agenda for the meeting was proposed by the chair of the session Mr. Abdishukri Suleiman a representative from the Garissa County Ministry of Agriculture, who was standing in for the County Project Coordinator (CPC) for the Program to Build Resilience for Food and Nutrition Security in The Horn of Africa (BREFONS) Mr. Abdullahi Dakane and adopted by the members as follows;

- Preliminary matter
  - Introductions
  - Opening remarks
- Presentation of the proposed project by the Environmental Experts
- Project Impacts and Issue matrix
- Way forward
- AOB

MIN 1/18/03/2025: PRELIMINARIES

The meeting began at 1:10 p.m. with an Islamic prayer. Chaired by the Garissa County Agriculture department representative, introductions were made by all attendees followed by the Chair expressing his appreciation and extending a warm welcome to everyone. He acknowledged the government's effort in facilitating beneficial programs such as **BREFONS** for the vulnerable communities in arid regions, and requested the community to fully cooperate and offer support to the environmental team by sharing information needed to aid in the preparation of the Environmental and Social Impact Assessment (ESIA) report. The purpose of the meeting was to allow the project's Environmental Consultant to

present a detailed overview of the project and to inform the Haji Aden community, addressing any concern and soliciting their views and opinions on the project.

MIN 2/18/03/2025: PRESENTATION BY THE ENVIRONMENTAL CONSULTANTS

The Environmental Consultant for the proposed project, Mr. Erick Orwa, briefed the community on the ongoing BREFONS program, providing a comprehensive overview of the project in the chosen seven ASAL Counties of Kenya that includes Marsabit, Turkana, Isiolo, West Pokot, Samburu, Baringo and **Garissa**. He highlighted that BREFONS had drawn from the previous DRSLP project that had been implemented in the other six counties excluding Garissa.

He also explained the ESIA process and its relevance to the project, as well as the contractor tender process. The community was then invited to share their views on the project's importance, their current challenges, and the justification for the water pan construction.

MIN 3/18/03/2025: PROJECT IMPACTS AND ISSUE MATRIX

Community members highlighted several positive impacts of the project including;

- **Community Empowerment:** With a reliable water source, the community can focus on other developmental activities, such as education and entrepreneurship, leading to overall community empowerment and development.
- **Reduced distance to water source:** The nearest fresh water source currently serving the community is located 15 km away therefore the proposed water pan will greatly reduce the distance the community members have to travel to seek water for domestic use thereby creating convenience.
- **Improved health and hygiene:** The water pan will provide sufficient water to enable the residents perform cleaning duties consistently and also obtain clean water for drinking and cooking.
- **Economic Development:** Sufficient water availability will help stimulate economic growth by enhancing different farming activities such as crop farming, livestock farming that would in turn contribute to the development of Haji Aden Village.
- **Job Creation:** The project will likely create jobs during the construction and maintenance phases, boosting local employment and economic activity.
- **Community Resilience:** Access to a reliable water source would enhance the resilience of Haji Aden Village, enabling better adaptation to arid conditions and supporting the overall well-being of the community.

- **Soil erosion control:** By slowing down run off and capturing rainwater, there will be a reduction in soil erosion around the region thereby preserving soil quality.

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

KEY ISSUE	QUESTIONS FROM THE COMMUNITY	RESPONSE FROM THE CONSULTANT TEAM
Need for Piping and Water Kiosk	The community expressed a need for piping and a water kiosk to improve water accessibility.	• The technical team confirmed that indeed the project BoQs include the construction of a water kiosk to enhance water accessibility for drinking and domestic use.
Need for Water for Livestock	The community highlighted the need for adequate water supply for livestock alongside for domestic use.	• The technical team acknowledged the importance of water for livestock and confirmed that the BoQs include the installation of cattle troughs to ensure livestock easily get access to the water.
Toilets construction should consider their religion and cultural beliefs	Based on community's religion and cultural beliefs the community requested that toilets be constructed far apart.	• The technical team assured that indeed their inputs and recommendations will be factored in to guide on the toilet constructions.
Vandalism Challenges	The community raised concerns about vandalism of water infrastructure, which could affect reliability and safety of the water storage.	• The technical team acknowledged the issue of vandalism and recommended implementing security measures to protect water infrastructure. • Installing fencing, lighting, and surveillance around critical water facilities to deter vandals was suggested. Already the BoQ had a fencing component. • Engaging the community in safeguarding the infrastructure by reporting suspicious activities and participating in community watch programs was also emphasized.

		• Educating the community on the negative impacts of vandalism and promoting a sense of ownership and responsibility towards the water facilities was recommended
Water Depletion	The community was concerned about depletion of the water especially during the dry periods.	• The technical team responded that there will be need for the community to be trained and advised on proper water regulation to avoid over abstraction.
Schedule Timings for Drinking Water	The community requested scheduled timings for drinking water to ensure fair distribution and access for both humans and animals.	• The technical team recommended implementing a schedule for water distribution to ensure equitable access for all users, including humans and livestock. • Communicating the schedule clearly to the community and making necessary adjustments based on feedback and usage patterns was suggested. Encouraging community involvement in monitoring and managing the schedule to ensure fairness and efficiency was also emphasized.
Leadership challenges and possible conflicts	It was also reported that there is likely to emerge conflicts from leadership and management regarding use of resources.	• The technical team noted that the area under irrigation will be smaller and may not accommodate all members at the same time. They also took cognizance of the fact that resource management can be a source of conflict among members. The team pointed that the capacity building on the management committee will be continuous on financial management, procurement and maintenance. They also urged members to ensure active participation through bi-annual or annual meetings to discuss progress made and way forward.
Gender-Based Violence (GBV)	Concerns were raised about the potential for increased gender-based	• The technical team acknowledged the seriousness of GBV and recommended implementing comprehensive GBV

	violence (GBV) in the community due to changes brought about by the water pan project.	prevention and response measures as part of the project. • Collaborating with local NGOs and community organizations to provide education and awareness programs on GBV prevention was suggested. • Ensuring that project staff and contractors are trained on GBV awareness and prevention, and adopting a zero-tolerance policy towards GBV within the project was also recommended.
Child labor	Concerns were raised about the potential for child labor exploitation in the construction and operation of the water pan project.	• The technical team recognized the importance of preventing child labor and recommended strict adherence to national and international labor laws prohibiting child labor. • Implementing monitoring and enforcement mechanisms to ensure that no child labor is used in any phase of the project was suggested. Conducting regular inspections and audits to verify compliance with labor laws and standards was emphasized. Providing educational support and opportunities for children to ensure they remain in school and do not engage in labor activities was also recommended.

MIN 4/18/03/2025: WAY FORWARD

After the plenary session the meeting agreed that there was need for a full collaboration between the community and the contractors to ensure smooth service delivery. Training and sensitization of the community on issues of sustainability and capacity building was also emphasized.

MIN 5/18/03/2025: CLOSING REMARKS

The project environmental expert team appreciated the community members for attending the meeting. The community members appreciated the team for being informative and

giving them a chance to articulate their issues more clearly. The members also appreciated the effort made by the project consultants to honor the call and come for the meeting which has helped them to gain more insight about the proposed project.

There being no other business, the meeting was adjourned at 2:00 p.m.

Signed by:

Mr. Erick O. Orwa — **Environmental and Social Safeguards Consultant**

Appendix III: List of Attendants for Public Consultation

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

PROPOSED ACTIVITY: ESIA FOR THE PROPOSED HAJI ADEN WATER PAN

Date: 18th March 2025 **Venue:** HAJI ADAN Village

PUBLIC PARTICIPATION ATTENDANCE LIST

NO	NAME	DESIGNATION / VILLAGE	Gender M/F	Below 35 Years	Above 35 Years	ID NO. / P No.	TELEPHONE NUMBER	SIGNATURE / THUMB PRINT
1	ABSHIRO ABDI MOHAMED	HAJI ADEN	F		✓		0798670430	[signature]
2	HALIMA ~~SIYAT~~ IBRAHIM AHMED	HAJI ADEN	F	✓				[signature]
3	DAKANE MOHAMED OYO	HAJI ADEN	M	✓		41702249	0722766816	[signature]
4	IQRA MOHAMED ALI	HAJI ADEN	F	✓		711247071	0748290144	[signature]
5	HALIMA DUBOW DAGANE	HAJI ADEN	F	✓		32394625	0110136110	[signature]
6	ANTHONY EKEYA ASELI			✓		28232910	0723899039	[signature]
7	ERICK OGADA		M	✓		30772048	0700033598	[signature]
8	KIMOTHO Shilla		F	✓		38255216	0714644290	[signature]
9	ERICK O. OGADA	Head Expert	M		✓	24077629	0721178524	[signature]

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

PROPOSED ACTIVITY: ESIA FOR THE PROPOSED HAJI ADEN WATER PAN

Date: 18th March 2025 **Venue:** HAJI ADAN Village

PUBLIC PARTICIPATION ATTENDANCE LIST

NO	NAME	DESIGNATION / VILLAGE	Gender M/F	Below 35 Years	Above 35 Years	ID NO. / P No.	TELEPHONE NUMBER	SIGNATURE / THUMB PRINT
10	ALI ANSHUR MOMIN	HAJI ADEN	M		✓	0191051	0710714051	ALI
11	~~MOHAMED~~ AHMED ABDI OMAR	HAJI ADEN	M	✓		35289295	0726268201	
12	OSMATT ABDI OMAR	HAJI ADEN	M		✓		0725154488	
13	SIYAT IDRIS FARAH	HAJI ADEN	M	✓			0116614993	
14	MOHAMED SADIK ABDI	HAJI ADEN	M		✓	0050314	0743702365	
15	ABDULCATHI BULLE KHER	HAJI ADEN	M		✓		0724873055	
16	ABDI BUTHUL ELMI	HAJI ADEN	M		✓			
17	HABIBA YUSUF BUTHUL	HAJI ADEN	F		✓		0725658638	
18	HALIMA HUSSEIN YUSUF	HAJI ADEN	F		✓		0748172535	

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

PROPOSED ACTIVITY: ESIA FOR THE PROPOSED HAJI ADEN WATER PAN

Date: 18th March 2025 **Venue:** HAJI ADAN Village

PUBLIC PARTICIPATION ATTENDANCE LIST

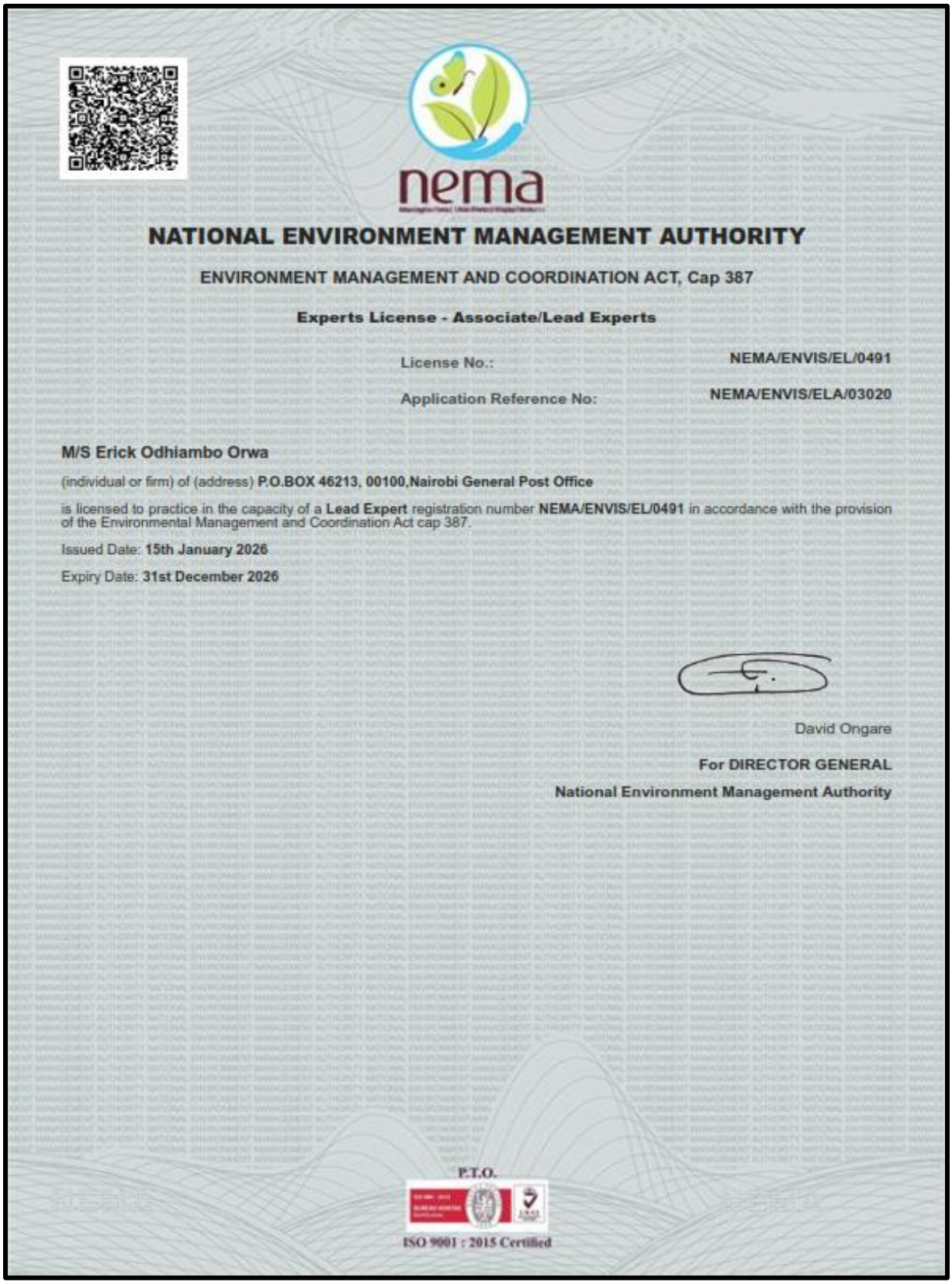
NO	NAME	DESIGNATION / VILLAGE	Gender M/F	Below 35 Years	Above 35 Years	ID NO. / P No.	TELEPHONE NUMBER	SIGNATURE / THUMB PRINT
19	KIMITEI ISAAC	DIRECTOR NEMA-GRS	M		✓	NEMA 032 L	0721541545	
20	ABDISHUKRI SULEIMAN	C.G.G.	m	✓		30351590	0725080554	

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

KEY INFORMANT INTERVIEW LIST

NO	NAME	DESIGNATION / INSTITUTION	CONTACT	SIGNATURE	DATE
1	KIMITEI ISAAC KIPCHIRCHIR	NEMA	0721541585		18/3/25

Appendix VI: NEMA Practicing License (Lead and Associate Expert)



nema

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

ENVIRONMENT MANAGEMENT AND COORDINATION ACT, Cap 387

Experts License - Associate/Lead Experts

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

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

M/S Erick Odhiambo Orwa

(individual or firm) of (address) **P.O.BOX 46213, 00100,Nairobi General Post Office**

is licensed to practice in the capacity of a **Lead Expert** registration number **NEMA/ENVIS/EL/0491** in accordance with the provision of the Environmental Management and Coordination Act cap 387.

Issued Date: **15th January 2026**

Expiry Date: **31st December 2026**

David Ongare

For DIRECTOR GENERAL

National Environment Management Authority

P.T.O.

ISO 9001 : 2015 Certified

EAE 23062335

FORM 5 (r.14(4))

nema

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

CERTIFICATE OF REGISTRATION AS AN ENVIRONMENTAL IMPACT ASSESSMENT/ AUDIT EXPERT

Certificate No: NEMA/EIA/RC/7501

Application Reference No: NEMA/EIA/ER/16530

This is to certify M/s **ERICK OKOTH OGADA** of

P.O.BOX 54-40100 (Address) has been registered as an Environmental Impact Assessment Expert in accordance with the provisions of the Environmental Management and Coordination Act Cap 387 and is authorized to practice in the capacity of a Lead Expert/Associate

Expert/Firm of Experts (Type) **Associate Expert**

Expert Registration No: **13489**

Issued Date : **8/13/2024**

Signature

(Seal)

Director-General
The National Environmental Management Authority

P.T.O.

Appendix V: Land Resolution Form / Consent

COMMUNITY LAND RESOLUTION FORM – GARISSA COUNTY

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

GORAPURA COMMUNITY WATER PAN

We, the beneficiaries of GARAPURA COMMUNITY Have discussed and agreed that GARAPURA will be the site for the proposed construction of GARAPURA WATER PAN in LAGDERA Sub County, HAALIMIN Ward, MAALIMIN Location, MAALIMIN DIHLE Sub-location.

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

(Names of three (NO) Beneficiaries' representatives)

S/NO.	NAME	ID/NO.	SIGNATURE
1.	OSMAN BASHIR SIRAT	20381848	OSMAN
2.	HALIMA AFI NOOR	0187318	[illegible]
3.	ISMAIL OBOO AHMED	3567979	Ismail
4.	ABDI SAHAL MUHAMMED	25668793	[illegible]

Witnessed By: ABDISHUKRI SULEIMAN

Chief office (Stamped)

NAME	P/NO.	DESIGNATION	SIGNATURE
MOHOW BAUD	2016131706	CHIEF	[illegible]

M. D. ELMOGE
HAALIMIN LOCATION
Date:

CDA'S OFFICE (Stamped)

NAME	P/NO.	DESIGNATION	SIGNATURE
MUSYIMI S. KYALO	19970227[illegible]	CDA	[illegible]

COUNTY DIRECTOR OF AGRICULTURE
GARISSA
P.O. Box 3[illegible] GARISSA
21 MAY 2025
Email: agriculture@garissa.go.ke
Sign:

County Government (Stamped)

(County Executive for Agriculture / Livestock)

NAME	ID/NO.	SIGNATURE
MILGO D KEINAN	24311123	[illegible]

(NB: Please add any other relevant information)

COUNTY EXECUTIVE COMMITTEE MEMBER
MINISTRY OF AGRICULTURE, LIVESTOCK, FISHERIES AND COOPERATIVES
21 MAY 2025
COUNTY GOVERNMENT OF GARISSA
P. O. BOX 295-70100 GARISSA

CamScanner

Appendix VI: Photo Gallery

The community member filling public questionnaires for the Proposed Water Pan.

The ESIA Lead expert explaining the project description and envisaged impacts to the community.

A Demonstration of Women's Representation as a Reflection of Project Interventions in Elevating Women's Livelihoods.

A community representative giving significant contributions and opinion on the proposed project.

A picture depicting the community setup and showcasing traditional regalia worn in the village.

A signpost directing to Haji Aden Village.

The Lead Expert, NEMA director in attendance to the community baraza.

The Garissa-Daadab Road leading to Haji Aden Village.

A typical housing structure in the village.

The community consenting to the proposed water pan project.

Proposed site identified for excavation the water pan showing a test pit for Soil Analysis for Water Retention Capacity.

Vegetation around the water pan area.

Some institutions identified within Haj Aden Community.	

Appendix VII: Chance Find Procedure

1. Purpose of the chance find procedure

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

2. Scope of the chance find procedure

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

3. Induction/Training

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

4. Chance find procedure

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5. Additional information

Management options for archaeological site

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

Management of replicable and non-replicable heritage

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

Replicable heritage[1]

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

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

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

Non-replicable heritage[2]

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

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

Human Remains Management Options

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

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

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

Appendix VIII: ESIA Inspection form

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

Appendix IX: Water Pan Crisis Action Plan (CAP)

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

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

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

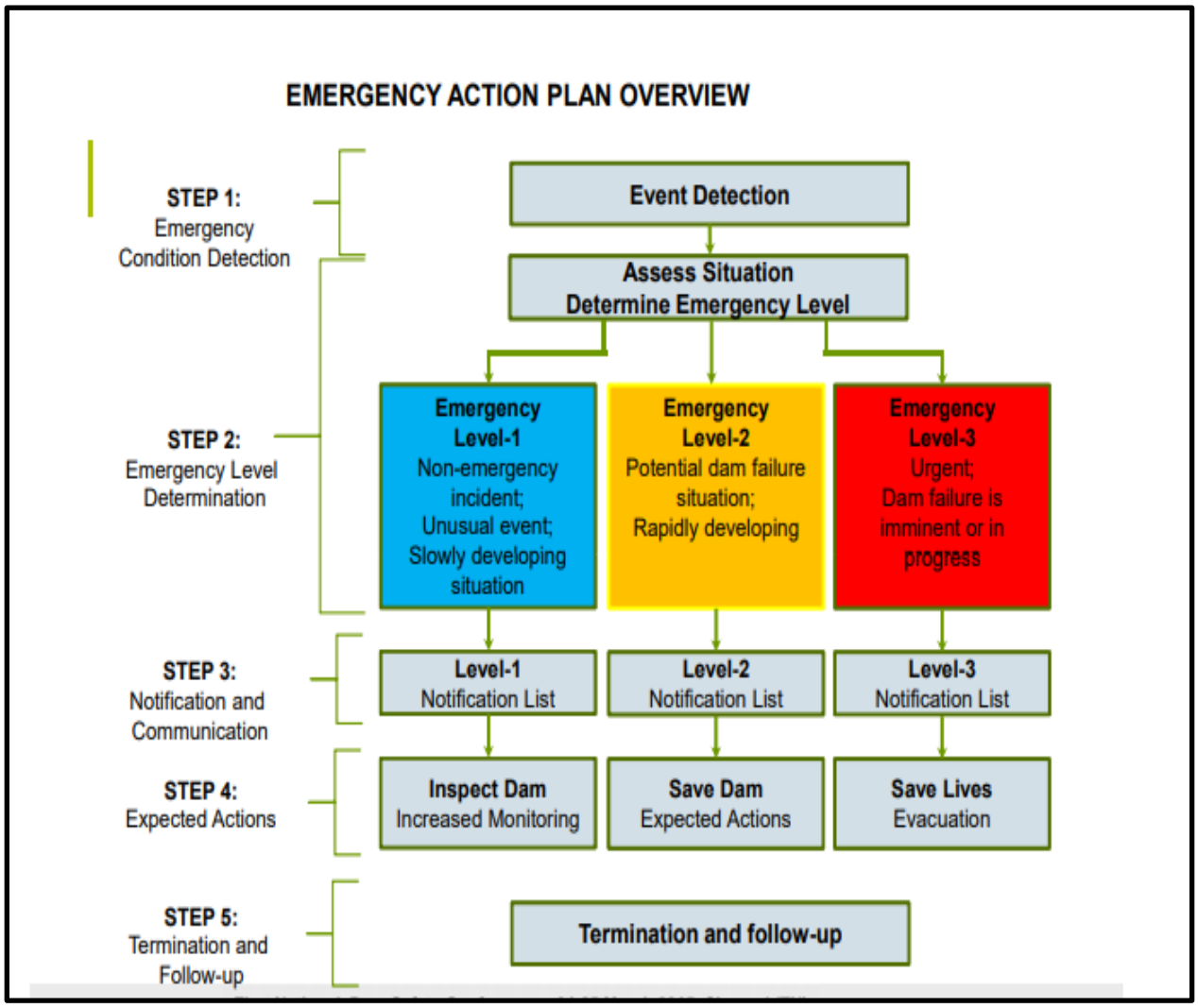
3. A list of names, addresses and telephone numbers (keep this up to date) of inhabitants living immediately downstream of the pan and within the estimated area of inundation.

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

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

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

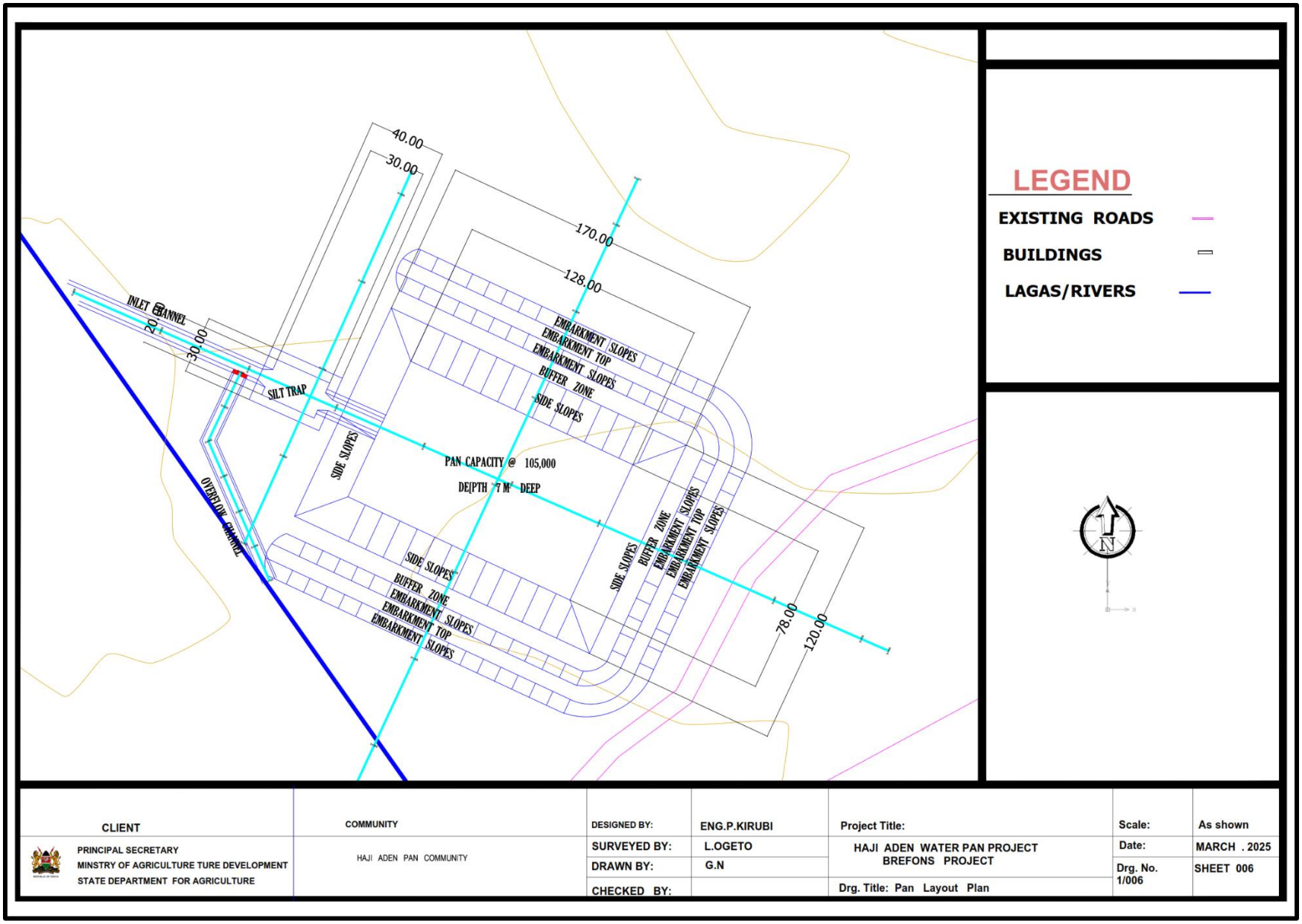
Appendix X: Overview of Emergency Action Plan

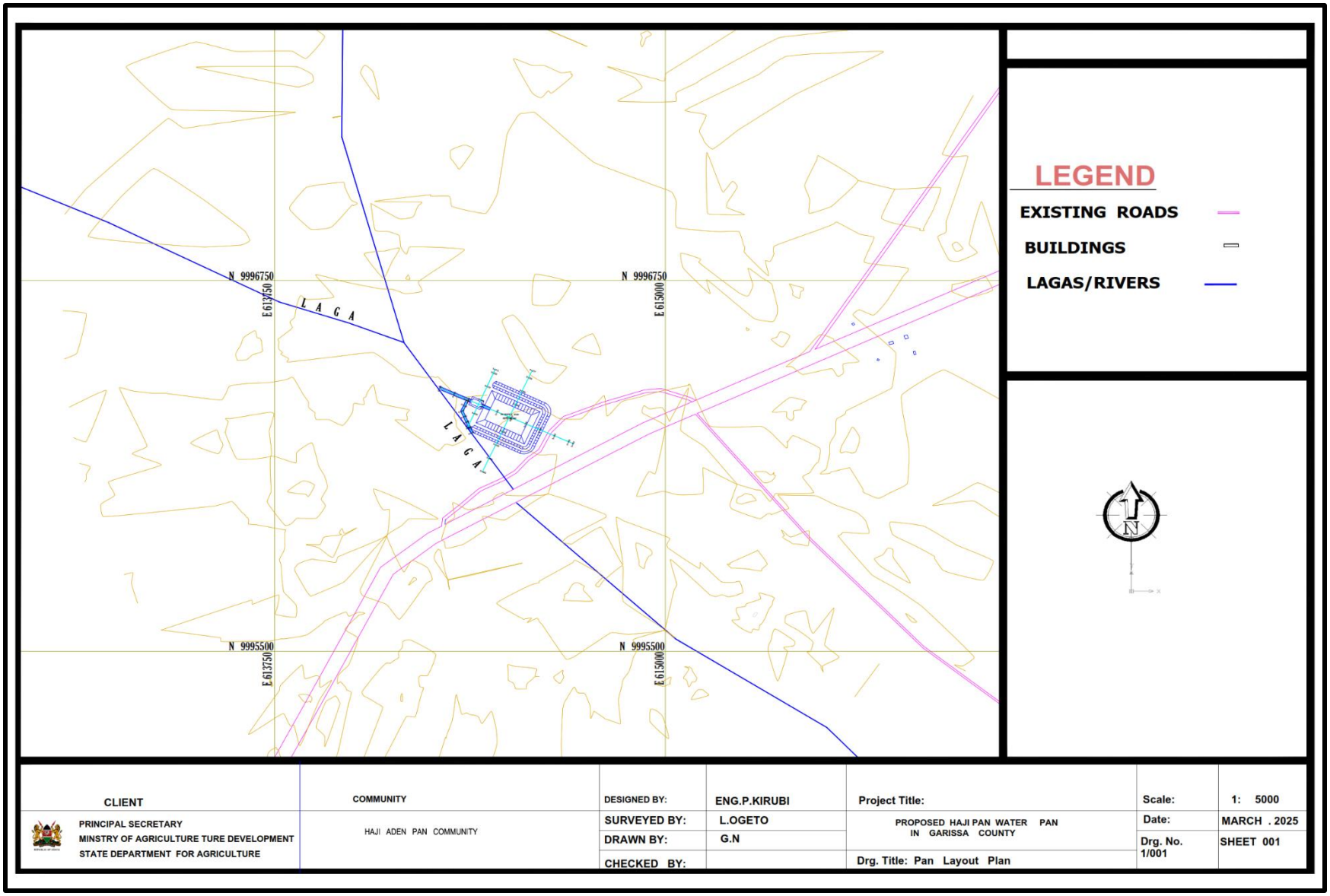


Source EGIS

Appendix XI: Haji Aden Water Pan Drawings and Design

ATTACHED


40.00
30.00
170.00
128.00
INLET CHANNEL
20.00
30.00
SILT TRAP
EMBARKMENT SLOPES
EMBARKMENT TOP
EMBARKMENT SLOPES
BUFFER ZONE
SIDE SLOPES
SIDE SLOPES
PAN CAPACITY @ 105,000
DE[PTH 7 M DEEP
OVERFLOW CHANNEL
SIDE SLOPES
BUFFER ZONE
EMBARKMENT SLOPES
EMBARKMENT TOP
EMBARKMENT SLOPES
SIDE SLOPES
BUFFER ZONE
EMBARKMENT SLOPES
EMBARKMENT TOP
EMBARKMENT SLOPES
78.00
120.00
LEGEND
EXISTING ROADS
BUILDINGS
LAGAS/RIVERS
N
CLIENT
PRINCIPAL SECRETARY
MINSTRY OF AGRICULTURE TURE DEVELOPMENT
STATE DEPARTMENT FOR AGRICULTURE
COMMUNITY
HAJI ADEN PAN COMMUNITY
DESIGNED BY: ENG.P.KIRUBI
SURVEYED BY: L.OGETO
DRAWN BY: G.N
CHECKED BY:
Project Title:
HAJI ADEN WATER PAN PROJECT
BREFONS PROJECT
Drg. Title: Pan Layout Plan
Scale: As shown
Date: MARCH . 2025
Drg. No. 1/006
SHEET 006


LEGEND
EXISTING ROADS
BUILDINGS
LAGAS/RIVERS
N 9996750
E 613750
N 9996750
E 615000
N 9995500
E 613750
N 9995500
E 615000
L A G A
L A G A
N
CLIENT
PRINCIPAL SECRETARY
MINSTRY OF AGRICULTURE TURE DEVELOPMENT
STATE DEPARTMENT FOR AGRICULTURE
COMMUNITY
HAJI ADEN PAN COMMUNITY
DESIGNED BY:
ENG.P.KIRUBI
SURVEYED BY:
L.OGETO
DRAWN BY:
G.N
CHECKED BY:
Project Title:
PROPOSED HAJI PAN WATER PAN IN GARISSA COUNTY
Drg. Title: Pan Layout Plan
Scale:
1: 5000
Date:
MARCH . 2025
Drg. No.
1/001
SHEET 001