



**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT SUMMARY
PROJECT REPORT
FOR
THE PROPOSED DUSOT COMMUNITY LIVESTOCK WATER PROJECT IN
CHERAP WARD, ISIOLO NORTH SUB-COUNTY, ISIOLO COUNTY**

(LATITUDE 1.808868 EAST, LONGITUDE 38.995518 NORTH)



**PREPARED FOR
DUSOT COMMUNITY LIVESTOCK WATER PROJECT IN LIAISON WITH KCSAP
ISIOLO COUNTY**

JUNE, 2021

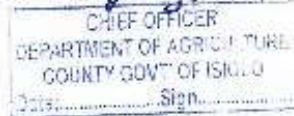
DECLARATION FOR SUBMISSION

DECLARATION BY THE PROPONENT

I Salad Tutana on behalf of Kenya Climate Smart Agricultural Project and the Dusot community beneficiaries **submit** this Environmental and Social Impact Assessment (ESIA)- Summary project report (SPR) for the Proposed Dusot Livestock Community Water Project in Isiolo County. The Environmental and Social Impact Assessment – Summary Project report has been carried out according to the Environmental Management and Coordination Act, 1999 and Environmental (Impact Assessment and Audit) Regulations, 2019; EMCA (Amendment) Act of 2015 and subsequent Public Notices 31 and 32 of April 2019. To our knowledge, all information contained in this SP report is accurate and a truthful representation of all findings as relating to the proposed Sub project development.

Signed in Isiolo on this 12th day of August 2021

Signature: [Signature] Signature: [Signature]
Name: Salad Tutana Name of Community Rep. Abdi Aden
Designation: Chief Officer Designation Chair



DECLARATION BY THE EXPERTS

This report is prepared for the proponent by:

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Date: 12/08/2021

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ABBREVIATION

2D	two-dimensional
3D	three-dimensional
BMU	Beach Management Units
CRS	Comments Registration Sheets
CSR	Corporate Social Responsibility
EHS	Environmental, Health and Safety
ESIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
EP	Equator Principles
ESIA	Environmental and Social Impact Assessment
KCSAP	Kenya Climate Smart Agricultural Project
ESMMP	Environmental and Social Management and Monitoring Plan
FGD	Focused Group Discussions
IFC	International Finance Corporation
MSDS	Material Safety Data Sheets
NADF	Non-Aqueous Drilling Fluids
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
NPCU	National Project Coordination Unit
OSH	Occupational safety and health
PPE	Personal protective equipment
PSC	Production Sharing Contract
SBM	Synthetic Based Mud
SPR	Summary Project Report

UNESCO United Nations Educational, Scientific and Cultural Organization WBM Water
Based Mud

GoK Government of Kenya
VEC Valued Environmental Components

UNITS

Km Kilometers

m Meters

m³ cubic meters

ng/J nanograms per joule

ppb parts per billion

ppm parts per million

μg microgram

TRANSLATIONS

Baraza Public Community Meeting

Boda Boda Motor bike used for Public Transportation

EXECUTIVE SUMMARY

This project report provides relevant information and an environmental consideration on the proponent herein referred to as KCSAP in liaison with Dusot Community Livestock Borehole, Isiolo County with intention to seek approval from National Environment Management Authority (NEMA); for the proposed: Borehole drilling with associated infrastructure i.e., solarised water pumps, water kiosk, fence, basic training hall and sanitation facilities. The proposed project activity is classified as a low-risk project under Section 58(1) The Environmental (Impact Assessment and Audit), EMCA (Amendment) of 2015 and Legal Notice Numbers 31 and 32 of April 2019 category 1c. This ESIA-SPR has been prepared in accordance with the national and international laws applicable to water exploration and drilling development. All activities will also be undertaken in accordance with other Kenyan legal and regulatory laws, International Best Practices/and World Bank Environmental and Social Safeguard policies. The Proponent aims at drilling borehole in Dusot area in Cherap Ward Isiolo North Sub-County, Isiolo County. The water will essentially be for domestic water use of the residents at a maximum depth of 250 metres deep, and will provide the necessary water supply of at least 29 M³/day. This is based on the needs of the beneficiaries, weighed against the assessed groundwater potential in the area and the requirements for other users.

The aim of this ESIA-SPR is to examine both the positive and negative effects that the proposed exploratory drilling project is likely to have on both the physical and the socio-economic environment. The ESIA-SPR relied on literature review; engagement of the public and relevant stakeholders; and primary sources of information such as socio-economic survey, ecological survey, noise assessment and hydrological survey undertaken. The ESIA-SPR Study covered the following aspects: establishing the existing environment and social aspects where the project falls; analyzing the potential impacts of the proposed project; developing accurate and practical mitigation measures for the significant negative impacts; developing an Environmental and Social Management and Monitoring Plan (ESM&MP) for the significant negative impacts; and identifying, consulting and involving all stakeholders. To achieve these objectives, the study collected data firstly through desktop studies on national and County levels, and then finally scoping down to the study area and its immediate environs.

A public meeting was held at the proposed site and the 45 community members attended the public participation meeting of which 34 were males and 11 females. Questionnaires were administered on 15 randomly selected community members within the catchment of the proposed borehole. The questionnaire focused on information gained from the screening process and other cross-sectorial issues such as health and safety, biodiversity, air pollution, noise, among others. Several methods and processes were undertaken to enable the achievement of the study's objectives as per NEMA and World Bank requirements.

Stakeholders identified were grouped into two categories: Primary Stakeholders and Secondary Stakeholders. Some of the key issues, concerns and comments raised during the stakeholder consultation exercise include concerns on the project's impact on biodiversity, waste generation and the methods that will be used to dispose of waste and concerns on sharing of water resource.

The impacts observed include what the stakeholder consultation highlighted and others. Mitigation measures include minimizing felling of the trees and shrubs on site; the contractor to put ideal mitigation measures in the C-ESMP and that the sub project will have a water user committee trained to ensure fairness in the water use by all. All the concerns were incorporated in the ESM&MP. Some

of the other main impacts and proposed mitigation measures include: Biodiversity (Flora, Fauna, Soil Characteristics) Impacts – recommended rapid regeneration of plant cover; and providing soil erosion control structures on the steeper areas of the site and controlling activities during the rainy season; impact on water consumption – it is recommended that to reduce impact of sourcing freshwater in Dusot village (which is a requirement into drilling exercise) the following should be adopted: building a storage pit which can be filled with freshwater before commencement of the sub project. The SPR clearly indicates that water quality in series aquifer falls within the WHO standards and is therefore fit for the proposed domestic application. Proper drilling methods and techniques have been recommended for optimal borehole performance in order to attain the expected flow rate of approximately 2M³/hr.

On social impacts, exclusion during employment is an issue with the local community. The government's policy is clear on the priority it gives enterprises keen on creating employment to the citizens. The drilling of the borehole will create employment during the drilling and the youth and other vulnerable persons will be expecting employment and so, the contractor has to be very keen on employment methods. The local food vendors also get their income from selling food to the drilling crew. For this, the contractor will hire 70% of workers locally and 30% as immigrants. The contractor will also liaise with the Area Chief and Ward Administrator to identify needy persons including the most vulnerable. Secondly, the impacts on child labor as it is not uncommon to find children working for pay because their parents asked them to do it. And therefore, the CPCU and contractor should be keen on this and avoid it through due diligence, community sensitization, putting the clause on child labour in the bidding documents for the contractor(s) to ensure mitigation through avoidance, and work with the County children's Department. Thirdly, Land Access for the Sub Project is another complex issue if not well handled. Isiolo County land is largely Community land under Community land Act 2016 where Community land is held by communities or registered group representatives but administered under the right of commons and members cannot be excluded from the benefits of enjoying that land. Dusot Village BH, North Sub County. The CPCU is advised to assist the Water Committee register this investment under a community that is using the water to administer and manage land on members' behalf and sensitize the water user Association to undertake proper land documentation assisted by the National Land Commission (NLC).

An environmental and social management and monitoring plan (ESM&MP) has been developed to manage the identified potential impacts and to keep the impacts at an acceptable level throughout the project's lifecycle whose activity budget is **KES 380,000** while the entire drilling exercise will be **KES 16.5 Million**. The ESM&MP shall consequently be shared with the contractor to formulate the C-ESMP. The Project Procurement will borrow a few clauses in insert in the bidding documents in order to lock the contractor in its implementation.

The SPR study finds the project is acceptable if the identified and developed environmental and social management plan and best practices are implemented accordingly. It also recommends appropriate monitoring of the project development and operational activities to ensure that adverse impacts that were unforeseen are identified and addressed in a timely fashion. NEMA is advised to license the project since it is a viable project. The ESM&MP will also be shared with the winning contractor so that the contractor domesticates it to C-ESMP and implement.

CHAPTER ONE

INTRODUCTION

1.1 Project Background

Isiolo County is categorized as among the arid and semi-arid land counties. It is normally faced with challenges of water scarcity especially during dry seasons. Parts of Isiolo North Sub County mainly Merti and Dusot in Cherab ward have a serious water shortage. The breakdown of boreholes is rampant in the strategic livestock grazing areas. Therefore, key to their sustainability is involvement and inclusion of all stakeholders and beneficiaries at all phases of the project cycle. This is mainly because of changes in grazing patterns and land use systems. During dry season, there is increased average distances to water and pasture. Demand for water increases and conflicts do occur over water and pasture.

The proponent Dusot community, Kenya Climate Smart Agricultural Project and the county government of Isiolo have expressed interest in constructing a borehole in Dusot Village Cherab ward of Isiolo North sub County

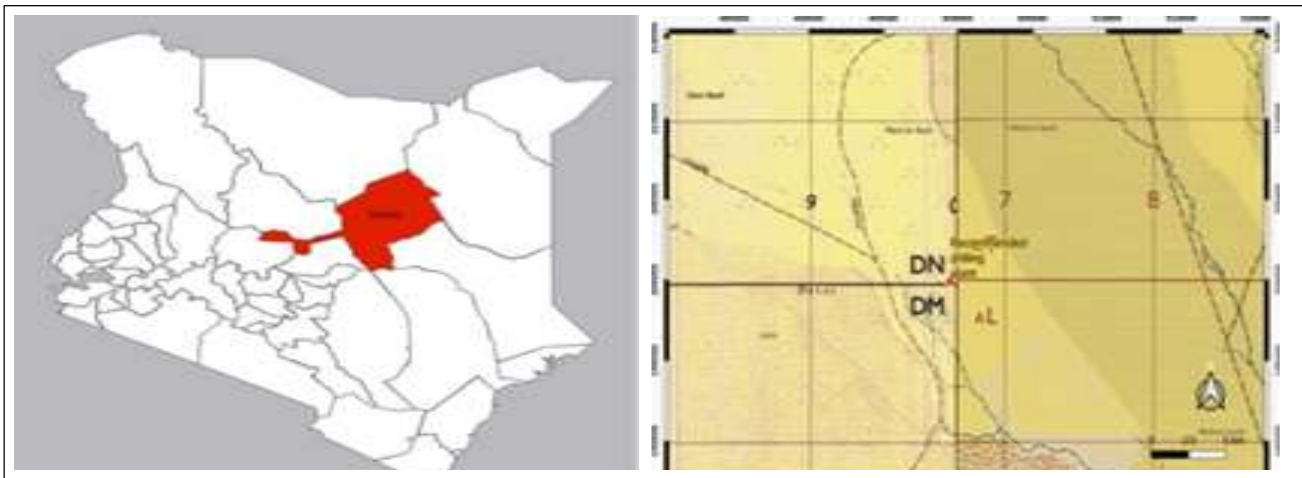


Figure 1: Map of Kenya indicating Isiolo and Location of the proposed Dusot Borehole

Source: Authors (2021)

1.2 Justification

The project is expected to extract reasonable volumes of water for domestic and livestock use at a maximum 29 cubic meters/day from a depth of about 250meters.

Currently, the beneficiaries of this project usually get water by scooping wells in the dry seasonal river beds. The water is stagnant and therefore not suitable for drinking if a better water supply source is available.

The proposed drilling and equipping sub-project has more positive impacts on the community than negative impacts: Approximate number of beneficiaries is 3,081. It is expected that there will be increased participation of the pastoralists in economic livelihoods, livestock herd diversification and use grazing lands resilience to livestock market price risks and creation of employment opportunities. It represents a key adaptation intervention to climate change that can cushion livelihoods from erratic weather patterns and drought mitigation.

Through Participatory Integrated Community Development approaches. The project has been prioritized by the community as key economic venture to boost the rural economy through increased production of livestock, employment creation and improved household nutrition. This is in line with World Bank supported Climate Smart Agriculture Project (KCSAP) project development objective of increasing agricultural productivity and building resilience to climate change risks among small scale farmers. Construction of the borehole will up-scale Climate-Smart Agriculture (CSA) Practices and resilience of the community.

1.3 The ESIA Summery Project Report Justification

The aim of this ESIA-SPR is to examine both the positive and negative effects that the proposed exploratory drilling project is likely to have on both the physical and the socio-economic environment. Specifically, the SPR seeks to address the following:

- a) Assess the impact on any rare species of plant or animal in the area.
- b) Assist Isiolo County in submission of the finalized ESIAs/Summary of Project Report (SPR).
- c) Determine the size and extent of the impacts based as much as possible on quantitative data rather than qualitative assessment highlighting certain topics (i.e. ecosystem sensitive areas, watersheds, waterlogging, flooding, resettlement, etc.)
- d) Develop an environmental and social management and monitoring plans with mechanisms for monitoring and evaluating the compliance and environmental and social performance which shall include the cost of mitigation measures and the time frame of implementing the measures.
- e) Establish community groups that will benefit and those disadvantaged (if any) by the project.
- f) Explain the monitoring and evaluation activities that are required to ensure that mitigating measures are implemented, and future problems are avoided.
- g) Identify mitigating measures needed and how they should be incorporated into the project design and procurement bids.
- h) Identify the impact on human and livestock health.
- i) Identify the main environmental and social effects of the proposed project, both in the project area and in the surrounding area and the timescale of the impacts.

1.4 SPR Approach and Methodology

The ESIA-SPR relies on information already available concerning environmental and socio-economic conditions in the area through literature review; information learned through engagement of the public and relevant stakeholders; and primary sources of information such as socio-economic survey, ecological survey, noise assessment and hydrological survey undertaken. The ESIA-SPR Study covered the following aspects: Screening on the viability and sensitivity of the project as per the attached screening **Checklist ANNEX IV** , establishing the existing environment and social aspects where the project falls; analyzing the potential impacts of the proposed project; developing accurate and practical mitigation measures for the significant negative impacts; developing an Environmental and Social Management and Monitoring Plan (ESM&MP) for the significant negative impacts; and identifying, consulting and involving all stakeholders. To achieve these objectives, the study collected data firstly through desktop studies on national and County levels, and then finally scoping down to the study area and its immediate environs. A public meeting was held at the proposed site and the project area on 10/6/2021, . Twenty nine (45) community members attended the public participation meeting of which 34 were males and 11 females (**ANNEX 1: Minutes and General**

comments from community and their leaders Public Consultation Process). Main Questionnaires were administered on 15 randomly selected community members within the catchment of the proposed borehole. This was done using detailed study, information from previous similar studies, developed checklist, and professional knowledge. The checklist focused on information gained from the screening process and other cross-sectorial issues such as health and safety, biodiversity, air pollution, noise, among others. Several methods and processes were undertaken to enable the achievement of the study's objectives as per NEMA and World Bank requirements. Some of the specialist studies that were carried out during the field baseline survey include: Ecological Survey; Socio-economic Survey; Hydro-geological Survey; Traffic Survey; and Noise Assessment

1.5 ESIA Team

The ESIA team members who took part in the study (Annex 5)

1.6 Report Structure

The structure of this ESIA Report is as follows:

Executive Summary; Introduction (Chapter 1); Nature of the Project (Chapter 2); The Location of the Project (Chapter 3); Public and Stakeholder Consultations (Chapter 4); Potential Environmental and Social Impacts and Mitigation Measures (Chapter 5); ESM&MP (Chapter 6); Conclusion and Recommendations (Chapter 7); Reference; and Annexes

CHAPTER TWO NATURE OF PROJECT

2.1 Introduction

This Chapter provides a description of the key Project components and details regarding activities throughout the life of the Project.

2.2 Project Background

The project of drilling and development of Dusot Livestock Community Borehole in Dusot village is sponsored by Kenya Climate Smart Agricultural Project and the county government of Isiolo. The project was identified during the Participatory Integrated Community Driven Development (PICD) Process conducted by KCSAP in Dusot Village of Isiolo North Sub-County in March 2019. During that PICD process, water for livestock and domestic use ranked number one priority of the development needs of the Dusot Community.

Availability of water for Livestock at Dusot is expected to improve access to grazing resources thus improving community resilience. It will also go a long way in availing portable water to the community which has suffered chronic water shortages for a long time. The project was also prioritized in the County Climate Smart Agriculture Investment Plan. The identification process involved the community opinion leaders, Administrative leaders (Chiefs, Ward Administrator), other Government agencies and development partners, after which they all agreed on the location of the borehole which is identified by the GPS Coordinates: 37N 499501mE 199934mN (longitude 38.995518° East, latitude 1.808868° North) and elevation of approximately 317 meters above sea level (WGS 1984).

The proposed project is set to benefit several beneficiaries totalling 2,700 (Males 1,890; Females 810). The direct beneficiaries are 500 (Males 150 Females 350) while indirect beneficiaries are 2200 (Males 1325 Females 875). The beneficiaries also include vulnerable beneficiaries (the poor, widows/widowers, orphans, physically challenged, elderly, HIV/AIDs affected/infected) who are 315 (Males 115; Females 200).

2.3 Project Location

The proposed project location is Dusot Village, Isiolo North Sub-County, Isiolo County. It is generally possible to balance environmental considerations with logistical needs and the need for efficient drilling. However, it is known that the borehole drilling project will concentrate in Dusot village in Isiolo North Sub-County of Isiolo County. Scope of work will cover the drilling of one borehole in Dusot village.

2.4 Exploratory Drilling Components

Exploratory drilling is a temporary and short duration activity and includes site preparation, equipment assemblage, and borehole site preparation, erection of the rig, drilling, testing and restoration of the borehole site. The success of this activity calls for involvement of beneficiaries and community members in this area. Mobilization and establishment will involve transportation to the project site of the drilling rig, drill pipe, casing, camp and other supporting equipment, drilling materials and consumables including fuel, drilling mud, among others.

2.5 Accessibility and Transportation

During this phase the drilling rig and ancillary drilling equipment will be transported by road using trucks. Consumables and ancillary equipment will be sourced locally to the extent possible.

2.6 Water Requirements

There are several options in sourcing fresh water:

- i. Building a storage pit which can be filled with freshwater before commencement of the project, which can act as an available reserve to minimize possible over abstraction with the local supply.
- ii. Locating a local source that is acceptable with the local community.
- iii. Water from the nearest river source with a water tanker.

The best options we would recommend to be used during this project would be sourcing water from nearby sources.

2.7 Power and storage requirement

The drilling process requires rotation of a drill bit through the draw works which requires power. A major part of the fuel will be consumed by the Rig and the rest by the base camp. A temporary fuel storage facility at the site will be established. Other chemicals and equipment used in the site such as cement and drilling mud will also require safe storage.

2.8 Labor Requirements

The drilling contractor and KCSAP are expected to employ and train residents from the area. The locals will be contracted to undertake manual work throughout the project cycle. Initially, local personnel will be involved in the functions requiring little previous experience. However, as the drilling program progresses, locals will be trained to undertake more skilled activities. The contractor must aim at meeting an employment policy ratio of 7:3 for locals and other employees respectively.

2.9 Drilling and Operation

The borehole will be a vertical well to a target depth of 250 metres below ground level.

2.10 Well Control

2.10.1 Primary Well Control: Drilling Mud

Primary well control is the control of pressure in the rock by using the weight of the drilling mud that is pumped into the well. The drilling mud prevents gas and fluids from the rocks from flowing into the well, it lubricates the drill bits and moves broken rock (cuttings) out of the way. During drilling, drilling mud will be continuously circulated down the drill pipe and back to the surface to:

- i. Facilitate the drilling process by suspending cuttings.
- ii. Balance underground hydrostatic pressure
- iii. Providing buoyancy
- iv. Cool the bit.
- v. Flush out cuttings.

There are three different types of drilling mud used in the drilling process, which are:

- a) **Water Based Mud (WBM)**- Most basic water-based mud systems begin with water,

then clays and other chemicals are incorporated into the water to create a homogeneous blend resembling something between chocolate milk and a malt (depending on viscosity).

- b) **Oil Based Muds (OBM)** - Oil-based mud is a mud where the base fluid is a petroleum product such as diesel fuel.
- c) **Synthetic Based Muds (SBM)** - Environmentally-friendly organic-based muds using a base fluid produced from natural gas or processed base oil or natural (non-petroleum) oils which are non-toxic and quickly biodegradable, such as the synthetic-based mud.

This proposed project will use WBM which has:

- i. less environmental impacts
- ii. less costs associated with cuttings, contaminated fluid disposal and tank cleaning on rig.
- iii. The kick detection is easier as gas does not readily dissolve in water.
- iv. Easier to get good cement bonding to casing and formation.

2.10.2 Secondary Well Control: Blow-out Preventer (BOP)

This measure is used if pressure of the formation fluids exceeds the hydrostatic pressure of the drilling mud. To prevent the risk of uncontrolled flow from the reservoir, a BOP is used to reduce the risk by sealing the off the well. The BOP is normally installed on the well head on the top of the surface casing and other strings of the casing are suspended from the wellhead. When the pressure caused by the weight of the column of the drilling mud in the well is less than the pressure of the fluid in the pore space of the rock, then the drilling mud will be unable to hold back the pressure in the rock and the fluid will flow from the rocks into the well. When this happens, the BOP will close to prevent the flow of the fluids from the well. The systems control panel keeps the valves open to allow flow from the well to rig. In case of an emergency the hydraulic valves close shut on the pipes, sealing it and preventing flow.

2.11 Waste Generation

2.11.1 Solid waste

The main sources of waste generated during the drilling campaign will be the drilling mud and cuttings; drilling rig waste; and domestic waste from the people working at the borehole site. The disposal method of cuttings to be used will be Potassium Acetate mud system, which limits chloride content of the disposed waste which makes it much more environmentally acceptable. During the drilling of the well all drilling waste will be contained on the location A reserve pit, which is used to dispose of rock cuttings and drilling mud during the drilling process, will be constructed, and lined with plastic to protect against any possible contamination. The liner will be removed at the end of the project after the residual liquids have been evaporated. The cuttings will be dried and dispersed/spread on roads. All other domestic waste will be removed from the location and disposed in an approved disposal site.

2.12 Decommissioning

In case the contractor drills a dry hole, (if the well is unsuccessful); the well will be plugged with cement and abandoned. The site will be deconstructed/ demolished, and the site will be restored to its original state through re-vegetation and continuous monitoring.

2.13 Project Schedule and Cost

The project is expected to take 3- 4 months to drill and construct the borehole and other facilities. Detailed Project Implementation schedule cost under Annex 2. The estimated total project cost is estimated to be Kenya Shillings, 16 million four hundred and thirty-one thousand nine hundred and eighty-six shillings and eight cents. (Kshs. 16,431,986.08).

CHAPTER THREE THE LOCATION OF THE PROJECT

3.1 Introduction

This chapter describes the project location, land ownership environmental sensitive areas, environmental, socio-economic and health characteristics of Dusot Village, Isiolo North Sub-county, Isiolo County. The geographic location of the site is 37N 499501mE 199934mN (Latitude 1.808868 East, longitude 38.995518North) and elevation of approximately 317 meters above sea level (WGS 1984). Figure 2



Most of the land in the Isiolo County is flat low lying plain. The plains rise gradually from an altitude of about 200 m above sea level at Lorian swamp (Habaswein) 300 m above sea level at Merti Plateau and 1100 m above the sea level at Isiolo town. The topography of the proposed site is generally flat, punctuated by laggas that flood during the rainy season. The drainage pattern in the area is dominated by the Ewaso Ngiro River, which often flows when all other rivers are dry, due to high rainfall at its headwaters in the Aberdare Range and Mount Kenya.

3.2 Land Ownership

More than 80% of the land is communally owned and is under the trusteeship of the county government. The land is communally owned and details of land ownership documents are attached in ANNEX 11 of the report

3.3 Climate and Meteorology

a) Altitude

Generally, Isiolo lies on 1095 m a.s.l. Isiolo North climate is a desert one. 1. The climate here is classified as BWh by the Köppen-Geiger system.

b) Temperature

The average temperature in Isiolo North is 26.8 °C | 80.3 °F. About 317 mm | 12.5 inch of precipitation falls annually. High temperatures are recorded in the county throughout the year, with

variations in some places due to differences in altitude.

c) Rainfall

The short rain season occurs between October and December with the peak in November while the long rain occurs between March and May with the peak in April. The topography of the landscape influences the amount of rainfall received. The higher ground areas near Mount Kenya and Nyambene Hills (Bulla Pesa, Burat and Kinna wards) receive between 500-670mm of rainfall per year. The drier eastern and northern parts of the county where the proposed project will be implemented receive less than 300mm.

(d) Fauna and Flora

Isiolo North region has shrub, bush thorny and short grass. Some areas also have the acacia-commiphora savanna grasslands, and trees are effective in filtering the air and blocking strong monsoon winds. The most preferred Forage Species Are *Aristida spp*, *Leptothrium Senegalensis* And *Sporobolus Helvolus*(Cattle) And *Indigofera spp*, *Rhynchosia sp*, *Occimum basilicum* and *Crotalaria sp*(Other stock, Shrub cover is 5%, Dwarf shrub cover 8% Forbs cover 8% and Grass cover is 4% The most common ungulates are Gerenuk, Girrafes, Zebras dikidik and a few buffaloes. Elephants do migrate to the area during wet season

(e) Soils

Dusost area is in the northern part of the county it is in an otherwise flat plain. The Basal Plateau or Pleistocene age (Mertis) originate from basalt (lava) flows which are deposited on the surface The extensive flat" table" surface is covered by deep calcareous reddish brown clays, often with scattered stones. The soils are called malbe or malbe-bule in Borana language. The term malbe indicates all Clayey and imperfectly to poorly drained soils that have shrink properties. These are usually the deep, cracking clay soils that have thick, loose-dusty surface layer.

(f) Hydrology

The hydrogeology of Isiolo North beds, forms the main aquifer body in the Isiolo North Aquifer. and the deposits in the Anza rift are "*capped by a few hundred meters of unfaulted Miocene to Recent sandstone, conglomerates and basalt*". Within this geological unit the Pliocene sediments are deposited that form the Isiolo North Beds that are generally assumed to have a "*red, white, gray or tan color*" and that "*include friable to semiconsolidated gravel, grit, sand, silt and clay, generally intercalated in lenticular beds*" (Swarzenski & Mundorff, 1977).

3.4 Socio economic status

The socio-economic baseline investigated the following parameters but not limited to:

Employment, labor supply and demand, gender, gender based violence, youth, supply and demand of local services such as health, education, housing, transportation, socio-cultural aspects such as quality of life, social problems, among others. In the development of the socio-economic section of the project location the following methodologies were used:

3.4.1 Gender

From the National census of 2019, results from the national bureau of statistics indicate that, there were 139,510 number of males and 128,483 number of women.

Action Aid Office, Isiolo County has raised the concern with women issues in Isiolo County over increase in cases of sexual and gender-based violence in homes. Men are now spending more time with their spouses at home due to the dusk to dawn curfew as well as directives to work from home and avoid unnecessary travel. That during COVID-19 pandemic, several people have already lost jobs leading to frustrations which have contributed to a sharp increase in cases of domestic violence. Apart from physical battering, cases of rape and even female genital mutilation are also on the rise. These cases must be handled with caution; firstly, the project should be able to sensitize target communities on GBV and where necessary guide them on how to report such cases to the local Police Station or alternatively send the word ‘SMS HELP’ to 21094 for action to be taken. It was also noted on (6) that about 9% of children aged 5-14 years engage on child labour. About 72% of children received some form of psychological or physical punishment one month prior to the survey. And 14% of children under-age of 18 years are orphans and 11% of them are vulnerable. Those living without biological parents at 18 years and below are 11% (6). This is a situation which requires careful handling by the project to ensure proper targeting. The situation is likely to affect the proposed project area

3.4.2 Youth

Isiolo County just like the rest of the Country, has a high percentage of youth than the rest of the population strata. The population of children under 5 years is 16%, 52% are between 15- 29 years of age and 5% are over 65 years¹ while 17% is the productive age 30-64 years. The youth here have various challenges namely: unemployment (which has been identified as a major reason why many young people are lured into other social evils); violent extremism and radicalization; and drug and substance abuse. The project may in a small way sensitize the youth into avoiding these social evils through giving them something to do. The project can also link the youth with Isiolo Youth innovation centre that helps the youth in accessing various online services and jobs.

3.4.2 Welfare

a) Education and literacy levels

Isiolo County still has a high rate of illiteracy with 20% of the population not having gone to school. Less than 10% had reached post-secondary level with majority only having gone to primary school. Dropouts were seen to be one of the major factors for this with reasons such as lack of school fees and early marriage being cited.

b) Economic Activities

Livestock ownership

Majority of the households in the proposed project area own cattle, goats and sheep. Camels, and donkeys. The mode of grazing is free range and land is owned communally in Isiolo North Sub County

3.4.3 Livelihoods

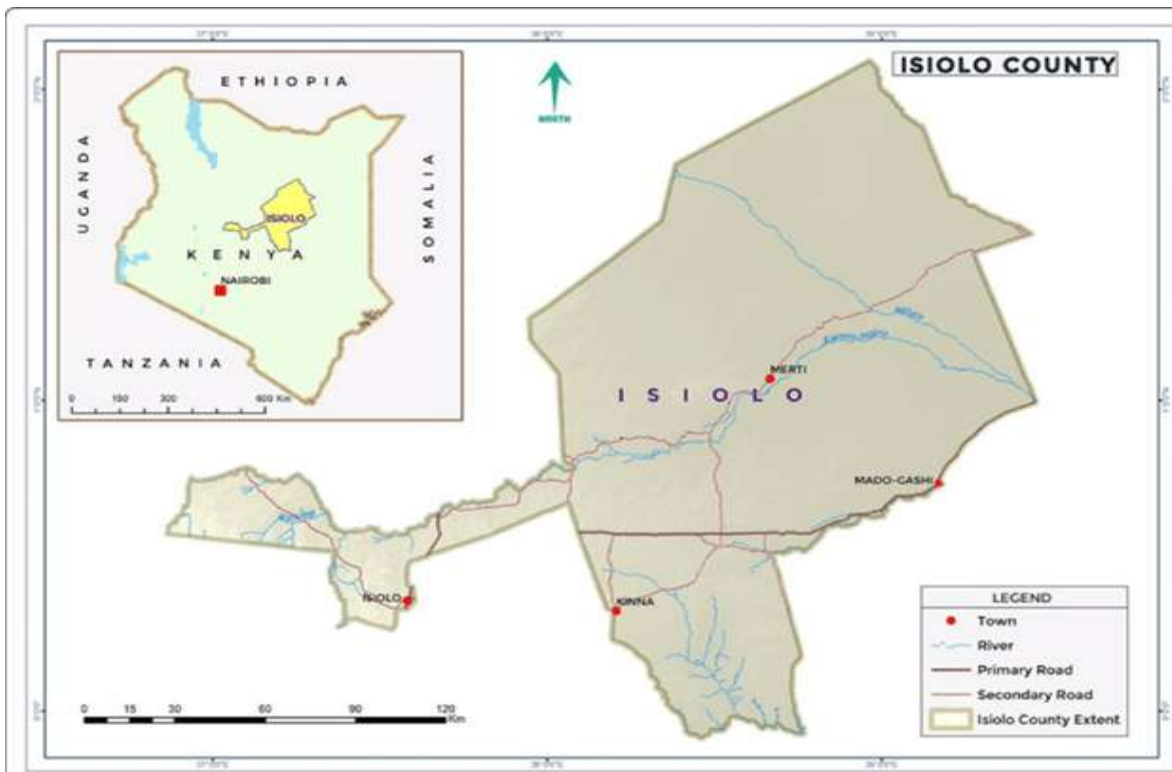
a) Energy

The county’s main source of energy is wood fuel. This poses a health risk to most women in the community and has a negative impact to the environment in terms of deforestation. 85% of the

households rely on fire wood as their main source of power, mainly for cooking. This has partly contributed to a decline in tree cover.

b) Water and Water Quality

Isiolo North aquifer, Garbatulla-Modogashe aquifer that covers the dosut area (the proposed site) has very low ground water potential.. All the rivers from each sub-catchment drain into the Ewaso Nyiro North River which is the main drainage system in the area (CDAP).Ewaso Ngiro is perennial as far downstream as Isiolo North. During most of the year, however monthly discharge may reduce to as less as 2 or 3 million cubic in February and March. The hydrology of Isiolo has been studied by many researchers which led to the improvement of existing sources as well as local new water supplies; all this is contained in the files of water department. These reports contain borehole logs and references to availability of ground water. The county population largely depends on groundwater and shallow wells. The water quality depends on the hydro-chemical character of the recharge waters and the aquifer matrix. This zone is referred to as zone of chloride waters (Ogwenyi,1973) extending from the lake Rudolf southwards through Samburu, Isiolo and Kitui.



c) Sanitation

In Isiolo, 44.2% percent of the population still use open defecation while 22.8%, 19.3 and 13.7% uses improved, shared, and unimproved sanitation respectively (MoH and WSP, 2014). Human and animal waste is identified as the major pollutants of water.in Isiolo North during the ESIA Survey, it was observed that methods used for discharge of wastewater included directing into septic tank, outdoor pouring, and using pit latrines. This can pose a problem of water borne diseases outbreak in the area.

d) Solid waste

In Isiolo North Sub-County, Solid waste is handled through open burning and dumping into pits.

Organic waste is sometimes taken to *shambas* as a form of manure.

3.4.4 Housing and dwellings

In the rural areas most of the houses have been constructed using mud, grass and wood walled. These dwellings are called “Manyatta” and are temporary in nature. A total of 9,850 of Manyattas are made of mud and sticks walls while 5,491 are made up of grass and sticks walls as per 2009 census. Permanent housing structures are only found in Isiolo town and other upcoming urban Centres.

3.4.4 Security

In Isiolo North , increased numbers of youths are abusing drugs thus becoming addicts. This has led to incidences of theft and robbery in the area; however, their severity is quite minimal. Conflicts over grazing land and water resources, joblessness and drug abuse are some of the main security threats in Isiolo North . Major common crimes in Isiolo County are focused on resource-based conflict (e.g. land-based resources which may be both inter-communal and between pastoralists and other groups / entities using land); Inter-county border conflicts which may be both political and inter-communal; Ethno-political conflict; Inter-personal violence such as gender violence and youth violence. The security threats and the way to address them include creating employment opportunities, reducing tribalism, establish rehabs, reduce inequality, increase penalties to low breakers, increase employment, increased police presence.

3.4.5 Health

Most of the health facilities are in Isiolo and Garbatulla sub counties while Isiolo North has only three operational facilities and therefore there is need to operationalize already constructed facilities in the county. According to the key informant’s survey, Malaria and fever were the most common diseases among the people. Other common diseases, Shortage of medical staff, equipment and medicine were cited as the biggest challenge in access to medical care.

CHAPTER FOUR

PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATIONS

4.1 Introduction

This chapter describes the Stakeholder Engagement Exercise that was carried out for the proposed Dusot Community Livestock Water borehole drilling project on Dusot Village, Isiolo North Sub-county, Isiolo County. The aims of the exercise was to ensure all relevant stakeholders were provided with the opportunity to express their concerns and opinions and in turn have them reflected in the ESIA and ESMP. The stakeholder engagement exercise is also provides NEMA with the necessary information to assist it in making an informed decision about the Project.

4.2 Objective of public participation

The main objective of the exercise was to inform stakeholders about the project and its likely effects, which in turn would incorporate their inputs, views, and concerns, and thus enable their views to be considered during the decision-making. The specific objectives of the consultations were to:

- i. Obtain local and traditional knowledge that may be useful in decision-making including any Indigenous Knowledge Systems (IKS) (if any).
- ii. Facilitating consideration of alternatives, mitigation measures and trade-offs (if any).
- iii. Ensuring that important impacts are not overlooked, and benefits are maximized.
- iv. Reducing chances of conflict through early identification of contentious issues.
- v. Provide an opportunity for the public to influence the project design and operational plan in a positive manner.
- vi. Improving transparency and accountability of decision-making; and
- vii. Increasing public confidence in the ESIA.

4.3 Objective of public participation

The first step in the process of public participation process was stakeholder identification. Stakeholder identification was to determine all organizations and individuals who may be directly or indirectly (positively or negatively) affected by the proposed project. In the end, the stakeholders were grouped into two main categories depending on their various needs, interest, and potential influence on the project, which are:

Primary Stakeholders: These are stakeholders directly affected by the project such as the local residences/ communities.

Secondary Stakeholders: These are stakeholders that are affected indirectly by the project but influence development through project implementation. These include but not limited to: National Government, Isiolo County Government, Local Government, non-governmental organization (NGOs).

4.3.1 Methods of stakeholder Engagement

Enumerators were employed during the stakeholder consultation period to undertake socio-economic questionnaires with key community members and stakeholders. The interviews were expected to yield the following information:

- Socio-economic characteristics of the area. This information was used to corroborate and verify data obtained from other sources, such as the literature review and the qualitative

- household survey.
- Impact of the project on the social,
- cultural and
- community settings



Plate 1: Community members sharing the checklist and discussing the possible impacts

4.3.1 Stakeholders Consulted

The stakeholder consultation process was conducted from 4 June, 2021 – 10th June 2021, two meetings held in Isiolo County where 45 community members attended the public participation meeting of which 34 were males and 11 females. Questionnaires were administered on 15 randomly selected community members. The ESIA/SPR study team that took part in the stakeholder consultation exercise is in Annex 5. And list of participants is attached in ANNEX III of the report

4.3.3 Stakeholders Consulted through questionnaires for Key institutions

Table 1 Summary of stakeholders consulted

Date	Contact Person	Institution	Position Role
4 th June 2021		Isiolo North Community Water Project	Secretary
6 th June	Paul Kasimbu	Lands Commission Isiolo	County Coordinator

2021	Elizabeth Ekiru	County Lands Office Isiolo	County Surveyor
	Martin Mzee	Public Health Isiolo	Deputy county Public Health Officer
	Lordman Lekalkuli	National Draught Management Authority Isiolo	County Draught Coordinator
	Murethi	NEMA Isiolo	Environmental Officer
Date	Contact Person	Institution	Position Role

4.3.4 Summary of the Key Issues, Concerns and Comments raised

Communities raised concerns that the project might have both environmental and socio-economic effects to the surrounding communities. Below are some of the issues raised and explained in details under Annex 6):

- Environmental Impact on Biodiversity
- Waste generation at the drilling site
- Fears on water quality in the wells after drilling
- Noise and Vibration
- Discrimination in employment
- Land tenure, ownership, and land use
- Health and Safety Issues

Social impacts

- Infrastructural Development will improve accessibility
- Employment generation
- COVID-19
- Domestic Violence
- Gender based Violence
- Child Labour
- Increased wildlife and livestock conflicts

Some of the mitigation measures proposed were:

The project should be able to sensitize target communities on GBV and where necessary guide them on how to report such cases to the local Police Station or alternatively send the word ‘SMS HELP’ to 21094 for action to be taken

CHAPTER FIVE

ANTICIPATED IMPACTS AND MITIGATION MEASURES

5.0 Introduction

This chapter outlines the potential negative and positive environmental and social impacts that maybe associated with the project. The impacts are related to activities to be carried out during the life cycle of the project: that is, preparation, design, construction, operation, and decommissioning phase.

5.1 Positive Impacts

- **Creation of employment and business opportunities**

The design and construction phases of the sub project will create employment and business opportunities for various professionals/consultants involved in the planning stage of the project. The employment opportunities will be either directly in the sub project or indirectly through associated businesses (supply food stuffs in the camp), including the generation of employment for skilled and unskilled labour in the short to medium term.

- **Infrastructural development**

The roads leading to the site will be modified to ease access of transportation of civil engineering staffs, drilling rig and other construction materials to the site. The roads to the site will also serve other residents who are set to benefit from this infrastructure development brought by the sub project.

- **Improved economic growth**

The resources and raw materials needed for the success of the sub project such as fuel/oil, food, water, among other; will attract taxes including VAT which will be payable to the government hence increasing government revenue while the cost of these raw materials will be payable directly to the producers.

The locals may also indirectly benefit by providing goods and services through associated businesses to the camp.

- **Provision of cheaper building materials**

Recyclable building materials such as stones, metals, glass, wiring, electronics, and plumbing etc., maybe used for future projects strategically to increase the productivity of the purposes the establishments in which they are used.. This will assist in promoting development where it's mostly needed and generally improve the quality of life in those areas and cumulatively in the country.

5.2 Negative Environmental Impacts

Preparatory Phase

- **Conflict on land issues**

Land acquisition in Dusot, is sensitive though the land is communally owned

Mitigation measure:

Constant communication with the land users and community leaders and members . Communicate with local administration, national and county government. NLC should be involved to provide guidance and direction.

- **Construction Phase**
- **Vegetation Loss/Biodiversity Flora**

Due to varying soil types, Dusot is sparsely populated with scrub bushes and indigenous trees, and scrubs. Grassy open plains dominate the area of Dusot village. The borehole site is largely covered by shrub and bush. Vegetation will be lost or altered to pave way for construction activities for access roads and the borehole.

Mitigation measures:

Clearing vegetation only in construction areas and demarcating areas where no clearing will happen. Sensitization on the importance of flora and fauna in the areas, including the appropriate regulatory requirements. Rapid regeneration of plant cover must be encouraged by setting aside topsoil during earthmoving and replacing onto areas where the re-establishment of plant cover is desirable to prevent erosion if it was necessary. Implement a tree planting program within the borehole to offset loss of trees due to the construction phase.

- **Soil Disturbance/Soil Loss**

Activities such as movement of truck transporting drilling materials to site and the construction of the borehole will lead to disturbance of the topsoil which will cause soil erosion. Due to the heavy nature of drilling equipment's to be transported by road the roads will be upgraded; and where necessary bridges and drainage and culverts will be strengthened and reinstated. These activities will lead to the disturbance of topsoil leading to an increase in dust levels.

Mitigation measures:

Work areas should be clearly defined and demarcated, where necessary to avoid unnecessary disturbance on areas outside the development footprint. Manage storm and flood flash water effectively to avoid movement of loss soils. Vehicles coming into the site must use designated roads. Sprinkling water periodically when operations are under way to prevent raising of dusts. Impose and enforce speed limits and provide driving guidelines for vehicle operators; for example, 40 Km/hr.

- **Introduction of Invasive species**

During movement/transportation of drilling equipment and materials to the project site will create the risk of introducing invasive species from one area to another. For example, invasive species are introduced into new areas through foods, stowaway's that attach themselves to shipping ballast tanks, shipping crates, and passengers.

Mitigation measures:

Develop a plan for control of noxious weeds and invasive plants that could occur because of new surface disturbance activities at the site. The plan should address monitoring, weed identification, the way weeds spread, and methods for treating infestations.

- **Air Pollution**

Air pollution because of fumes and gases from vehicles and machinery such as generators or fossil fuel using machines, will generate emission such as oxides of Carbon, Sulphur, and Nitrogen, which will pose risks to environmental and human health. Such emissions will contribute to both regulated pollutants and greenhouse gases in the project site. Raised dust because of anthropogenic movements such vehicle movements, throughout the drilling program will also contribute to air pollution.

Mitigation measure:

Use of low Sulphur fossil fuel. Regular maintenance and services of machines and engines. Educate

and raise awareness to construction workers on emission reduction and emissions that are likely to occur.

- **Respiratory Diseases**

The health effects of exposure to fumes and dust generated from construction activities of the borehole, vehicle movement transporting drill rig to site can include irritation of the upper respiratory tract (nose and throat), tightness in the chest, wheezing, lung damage, bronchitis, sight problems.

Mitigation measures:

Provide workers with appropriate PPE such as dust masks.

- **Noise Pollution**

During the construction phase of the proposed project, there will be an increase in the noise levels within the area due to machinery/ equipment including generators, vehicular traffic, and other construction activities. Elevated noise levels within the site will affect project workers and the residents, passers-by, and other persons within the vicinity of the project site. The estimated average level of noise generated during the construction phase is about 65 dBA covering 500 feet from the source. Machinery should be maintained regularly to reduce noise resulting from friction during operations.

Mitigation measures:

Using modern machinery equipment with noise suppressing technologies to reduce the noise-rating as much as possible. Natural gas or diesel engines can be replaced with electric motors². These motors, if properly installed, tend to be much less noisy than their engine counterparts. The use of electrical motors depends on the availability of electricity. Locate all stationary construction equipment (i.e., compressors and generators and exploratory wells) as far as practicable from nearby residences and other sensitive receptors. Vehicle movement should be limited to daytime hours, except in emergency cases, to reduce generation of noise.

- **Occupational Health and Safety (OHS)**

Below are some of the hazards that will lead to health and safety risk if proper HSE procedures are not followed: Working in confined spaces; Injuries caused by moving objects; Working at heights; Fire risks. Workers will also be exposed to biota in the area that can pose health and safety risks such as snakes, scorpions, mosquitos, among others.

Mitigation measures:

Provide workers with appropriate PPE such as goggles, gloves, hard hats, overalls, earmuffs, among others. Employing an Occupational safety and health (OSH) plan that will outline all OSH risks and provide a strategy for their management. Maintain on site a record of incidents and accidents. Provision of warning signs warning of construction activity and heavy machinery turning. Providing firefighting equipment and in easily accessible areas as well as ensuring site personnel are well trained to use them as well as maintaining them regularly. Raising awareness, educating workers on risks and use of equipment; animal species and habitats found in the area and their risks; first aid training.

- **Visual Impact**

Tourism impact - Construction activities such as clearing of vegetation, transportation of drilling materials to site, construction of the borehole will affect aesthetic values of the area. This might affect tourism in the area due to the sudden movements of equipment's and people in the area including wildlife.

Mitigation measures:

The design should take advantage of the existing topography and vegetation and should use low profile facilities and storage tanks if technically feasible and if the overall facility. During construction, existing vegetation around the perimeter of the site should be maintained to minimize views into the site. Following construction, natural vegetation should be restored in nonoperational areas of the site and/or additional landscape planting with local indigenous species used to improve views into the site. Consider site-specific landscaping in selected area to provide screening for resident whose property abuts the project.

Consider suitable paint color for large structures that can blend with the background. Consider the use of existing utility and transport corridors for access roads to the extent possible. Ensure good housekeeping of the site to create a positive image in the eyes of the public.

- **Fauna Disturbance**

Short-term disturbance of local habitats from base camp lights, drilling noise, vehicular traffic and other activities will lead to changes in – animal habitat, food supplies, migration routes of birds or changes in herbivore grazing patterns (livestock) etc. From the socio-economic survey conducted, Consultant majority of the respondents practice livestock keeping. Livestock grazing is practiced in and around the area. Depending on the location of the proposed project site this will affect grazing patterns but at a minor level. Other wild species such as dik dik, wild dogs will be affected by the light and noise pollution from the proposed projects.

Mitigation measures:

Educate workforce on environmental concerns and implement policies to protect biodiversity. Schedule operations during least sensitive periods such as species migration periods, nesting and mating seasons. Keep the workforce within defined boundary and to the agreed access routes for vehicles. Implement a tree planting program within the borehole to offset loss of trees due to the construction phase. Ensure protection of important resources by establishing protective buffers to exclude unintentional disturbance.

- **Noise and Vibration**

The project involves drilling. Noise and vibration from the drilling operations are limited to the surrounding environment. Vibrations are localized and limited to the point of drilling. Noise and vibration pollution will emanate from flaring and rotating equipment-rigs. Noise sources will include flares and vents, pumps, compressors, generators, and heaters. However, the operational crew will be the most exposed to the noise and vibration and can be negatively affected.

Mitigation measures: Machineries should be maintained regularly to reduce noise resulting from friction during operations. Using modern machinery equipment with noise suppressing technologies to reduce the noise-rating as much as possible provision of warning signs should be made at the gate warning of construction activity and heavy machinery turning. A grievance procedure will be

established whereby noise complaints by neighbors are recorded and responded to.

Workers to be provided with PPE such as earmuffs and be trained on how to use them when operating in noisy environment. Housing engines and pump jacks in sound insulated building to reduce noise. Operating engines at their recommended constant number of revolutions per minute (RPM) to reduce the annoying fluctuating noise caused by engines slowing down or speeding down.

- **Waste Generation:**

The main sources of waste generated during the drilling campaign will be the drilling mud and cuttings; drilling rig waste; and domestic waste from the people living in the borehole. Domestic waste: containers, packaging, drinking water bottles, and miscellaneous waste form equipment; Drilling waste, drilling mud, drilling cuttings, plastics, and scrap metal. Typically, the solid medium used in most drilling fluids is barite (barium sulphate) for weight, with bentonite clays as a thickener. Drilling fluids also contain several chemicals that are added depending on the down hole formation conditions. These cuttings contain a proportion of residual drilling fluid. These spent fluids are then contained for reuse or disposal.

Mitigation measures: Storage in dedicated storage tanks or lined pits prior to treatment, recycling, and / or final treatment and disposal. On-site or off-site biological or physical treatment to render the fluid and cuttings non-hazardous prior to final disposal using thermal desorption in an internal thermal desorption unit to remove NADF for reuse, bioremediation, land farming, or solidification with cement and / or concrete. Final disposal routes for the nonhazardous cuttings solid material should be established, and may include use in road construction material, construction fill, or disposal through landfill including landfill cover and capping material where appropriate.

- **Oil and chemical spill**

This includes spills from domestic products used in cleaning; fuel stored on site used in vehicle, machinery used on site such as the drilling rig, generator. This will pose risk of soil pollution.

Mitigation measures:

Containerize spent oils and lubes for appropriate disposal or recycling. Containerize contaminated soils that cannot be treated in situ and remove off-site for treatment. Conducting maintenance and repair activities in well-established zones having paved surfaces to collect the oil and prevent soil pollution.

The borehole should be cordoned off to protect the general public from dangers associated with operations work. Ensuring all potential hazards such as movable machine parts are labeled. firefighting equipment and in easily accessible areas as well as ensuring site personnel are well trained to use them as well as maintaining them regularly.

Crete safe and adequate fire and emergency assembly points and making sure they are well labeled interaction between men and women.

5.3 Negative Social Impacts

5.3.1 Child abuse

Children within the project area will be exposed to risks associated with interaction between them and project workers. This includes child labour and sexual abuse which coherently leads to teenage pregnancies and exposure to communicable diseases such as HIV/AIDS.

Mitigation measures

- a) All staff must sign, committing themselves towards protecting children, a contract which clearly defines what is and is not acceptable behavior.
- b) Children under the age of 18 years will not be hired on site as provided by Child Rights Act (Amendment Bill) 2014.
- c) Refrain from hiring children for domestic or other labour, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.
- d) Comply with all relevant local legislation, including labour laws in relation to child labour specifically provisions of Kenya's Employment Act, 2007 (Cap. 226) Part VII on protection of children against exploitation.

5.3.2 Gender-based violence and sexual harassment (GBV/SH)

This impact is triggered during project construction phase when the contractor(s) fail to comply with the following provisions:

- a) Gender Inclusivity requirements in hiring of workers and entire project management as required by Gender Policy 2011 and 2/3 gender rule; and
- b) Failure to protect human risk areas associated with, disadvantaged groups, interfering with participation rights, and interfering with labour rights.

Mitigation measures

- a) Ensure clear human resources policy against sexual harassment that is aligned with national law.
- b) Ensure appointed human resources personnel to manage reports of sexual harassment according to policy.
- c) The contractor(s) shall require employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from SEA.
- d) The contractor(s) 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, e.g. compensation schemes; employment schemes for women; etc.⁴⁴
- e) The contractor shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment.
- f) 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.

5.3.3 Risk of increased incidences of HIV/AIDS and STIs

The influx of people may bring communicable diseases to the project area, including STIs, or the incoming workers may be exposed to diseases to which they have low resistance. This can result in an additional burden on local health facilities and resources. Local health and rescue facilities may also be overwhelmed and/or ill-equipped to address the industrial accidents that can occur in a large construction site.

Mitigation measures

- a) Contractor(s) to sensitize workers and community members on HIV/AIDS awareness and other communicable diseases to be instituted and implemented as part of the contractor's Health and Safety Management Plan to be enforced by the Supervising Engineer. This will involve periodic HIV/AIDS and other communicable diseases Awareness Workshops for Contractor's Staff.
- b) Controlled access to contractor's workforce camps by outsiders.
- c) Contractor(s) to provide standard quality condoms at the construction site during the construction period.

5.3.4 Sexual Exploitation and Abuse by project workers against community members

This impact refers to SEA 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.

Mitigation measures

- a) Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP
- b) The SEA action plan will include how the project will ensure necessary steps are in place for:
 - i) Prevention of SEA: including Code of Conducts and ongoing sensitization of staff on responsibilities related to the Code of Conducts and consequences of non-compliance; project-level Information Education Communication (IEC) materials.
 - ii) Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management.
 - iii) Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard grievance redress mechanism (GRM); mainstreaming of prevention of sexual exploitation and abuse (PSEA) awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights.

5.3.5 Grievances/conflicts

Common grievances expected to arise during the proposed project implementation include:

- a) Human and livestock interference with the project;
- b) Negative project impacts which may include disruption of income streams, physical harm, and nuisance from construction activities;
- c) Health and safety risks;
- d) Socially unacceptable project staff relations with the communities and other stakeholders;
- e) Conflicts over water sources; and
- f) Pollution and other environmental related impacts.

Mitigation measures

The following are possible mitigation measures to manage grievances:

- a) Establish a GRM for the proposed project;
- b) Seek to establish amicable relationships with stakeholders and manage the impact of the project activities on affected communities;
- c) Put in place a pre-emptive community liaison structure aimed at identifying potential issues arising from project-related impacts and addressing them before they become grievances;
- d) Establish a grievance redress mechanism targeting communities and other project stakeholders but not applicable to commercial and employee-employee relationships, and which will allow stakeholders to easily put forth their concerns relating to the project, implementation and have them addressed in a prompt and respectful manner;
- e) Ensure the grievance redress mechanism is available to the affected community members and stakeholders at no cost;
- f) Address all raised grievances, real or imagined and take reasonable steps to maintain confidentiality; and
- g) Educate all project stakeholders on the availability and use of the grievance redress mechanism, before, during and after construction of the proposed project.

5.3.6 Risk of increased spread of COVID-19 at work sites

The potential for the spread of any infectious disease like COVID-19 by projects is high. There is also the risk that the project may experience large numbers of its workforce becoming ill and will need to consider how they will receive treatment, and whether this will impact on local healthcare services including the project host community. The presence of international workers, especially if they come from countries with high infection rates, may also cause social tension between the foreign workers and the local populations.

Mitigation measures

- a) The contractor(s) shall put in place measures to prevent and manage the spread of the COVID-19.
- b) Provide relevant PPE for all project personnel and ensure that they use them appropriately.
- c) The contractor(s) will develop Standard Operating Procedures (SOPs) for managing the spread of COVID-19 during project execution. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions.

- d) The project shall put in place means to support rapid testing of suspected workers for COVID-19.
- e) Avoid concentrating of more than 15 persons or workers at one location. Subject all workers and visitors to rapid COVID-19 screening which may include temperature check and other vital signs.
- f) Install hand washing facilities at entrance to work sites including consultation venues and meetings and ensure they are used.

5.7 Decommissioning Phase

This involves demolition of the borehole and its abandonment after a certain period. There are varied reasons for the abandonment of a borehole; these include inadequate water or drying up of the aquifer due to activities uphill, poor water quality, defective construction and legal implications.

During the abandonment period, a lot of caution needs to be observed so that the materials can be reused on another project and to avoid contamination of the remaining water in the aquifer. Proper records should be maintained during project implementation and later filed with the Water Resources Authority (WRA) as required. Water level and any obstruction around the vicinity of the project need to be identified. Obstructions such as pumps, pipes, wiring must be pulled out and be used in alternative project. Scrap metal such as Iron sheets can be sold to metal scrap for safe disposal.

CHAPTER SIX

ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

6.1 Introduction

In this part of the report, environmental and social management and monitoring control measures are articulated. The control measures seek to avoid, minimize, and manage all the environmental, social, health, and community related risks and negative impacts identified in the study. The chapter also covers monitoring indicators that the contactor and its contractors will use in evaluating the performance of the control systems. All these measures lie within the Kenyan legislations and international best practices as well as the contactor Internal Environmental, Social and Health (ESH) management systems. This ESMMP sets a benchmark for successful implementation of the project as well as respect and conservation of both the social and environmental set up within which the project will operate. Some aspects of the ESM&MP recommend training and re-training of the responsible persons to ensure that they have the capacity to implement the recommendations on the control mechanisms. This implies that training and capacity building forms a key pillar in the implementation of the ESM&MP.

Table 2: Environmental and Social Management and Monitoring Plan

Phase/Category/Impact	Mitigating Measure(s)	Monitoring Indicator(s)	Verifiable indicators	Responsible person	Estimated Cost
PLANNING					
ENVIRONMENTAL					
Underground water depletion	Proper monitoring of number of boreholes being authorized by the Water Resources Authority within the proposed area.	Reports, Meetings	Water table test reports; minutes of meetings attendance list; letters of invitation	WRA/Community water committee	10,000
	Encourage water conservation in restrooms or work areas where water is used through sensitization of members and penalties meted by the Borehole Operator and submitted to the Community water management committee.	Meetings, Notes of instructions	minutes of meetings attendance list; letters of invitation	BH Operator/ Community Water Committee	1,500
	Monitor and meter the water system to determine the largest water consumption areas (Output water meter compared to the metered water in Kiosks, watering troughs or any other user point); monitoring also can help detect leaks in water systems.	Meetings, Barazas,	minutes of meetings attendance list; letters of invitation, p	CPCU/Water committee	1500
	a-Maintain borehole properly.	Meetings community barazas	letters of invitation minutes of meetings attendance list; photos	Borehole Management Committee	5,000
Water contamination	b-undertake regular water testing and analysis for the presence of microbial contaminants and other foreign contaminants.	Meetings, field visits	letters of invitation minutes of meetings attendance list; photos	Borehole Management Committee	10,000
	c-ensure proper siting, location, drilling and maintenance of the borehole for this minimizes the likelihood of water contamination.	Meeting	letters of invitation minutes of meetings attendance list; photos	CPCU/Committee	2,000
	d-Direct surface drainage away from the borehole casing, and surface water should not collect near the borehole.	Community barazas	letters of invitation minutes of meetings attendance list; photos	CPCU/Committee	3,000
SOCIAL					

Social risk - Spread of COVID-19 amongst community members during consultations	<p>√The Contractors will develop a SOPs for managing the spread of Covid-19 during project execution and submit them for the approval of the Supervision Engineer and the Client before mobilization. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions;</p>	<p>-availability of SOP(s), Training material, PPE, sanitizing facilities</p>	<p>letters of invitation minutes of meetings attendance list; photos</p>	<p>Contractor/BMC /</p>	<p>5,000</p>
	<p>√Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including</p>	<p>-no. of participants registered/ reached online.</p>	<p>Reports</p>	<p>Contractor/BMC /</p>	<p>5,000</p>
	<p>√Avoid concentrating of more than 15 workers at one location. Where there are two or more people gathered, maintain social distancing at least 2 meters. All workers and visitors shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs;</p>	<p>-Attendance registers of all meetings held</p>	<p>Reports '</p>	<p>Contractor/BMC '</p>	
	<p>√The project shall put in place means to support rapid testing of suspected workers for covid-19;</p>	<p>No Rapid Testing Kits No of suspected cases</p>	<p>Reports '</p>	<p>,</p>	
	<p>√Install hand-washing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used;</p>			<p>,</p>	
	<p>√Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc;</p>			<p>,</p>	

Health and safety of workers	a. Contractor will seal the borehole providing an exclusion zone for all.	-exclusion zone provided; electric fence done; frequency of checking the electric fence; No. of rules barring underage children going near BH;	Reports; minutes of meetings;	Contractor	BOQs
	c. Underage students and children will not be allowed near the borehole vicinity it will only be operated by an authorized person	Presence of an operator	Reports; minutes of meetings;	Contractor	BOQs
Discrimination in employment	Contractor will hire 70% of workers locally and 30% as immigrants.	Meeting/barazas	letters of invitation minutes of meetings attendance list; photos	Contractor	BOQs
	The contractor will liaise with the Area Chiefs and Ward Administrators to identify the needy persons including the most vulnerable.	Meetings	letters of invitation minutes of meetings attendance list; photos	Contractor	
	The contractor will also give equal opportunity to all vendors.	Barazas	Reports	contractor	
	-The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;	No of workers sensitized on COVID-19		CPCU	10,000
Security	creating employment opportunities, reducing tribalism, establish rehabs, reduce inequality, increase penalties to low breakers, increase employment, increased police presence.	Sensitization barazas	letters of invitation minutes of meetings attendance list; photos	CPCU	2,000
CONSTRUCTION					
ENVIRONMENTAL					
Soil compaction	The contractor will always use a predetermined route to the site.	Meetings	letters of invitation minutes of meetings attendance list; photos	Contractor	2,000

	--Unnecessary heavy machines will be avoided.- -Operations will be timed to take place during the dry season when the soils are dry to reduce the risk of soil compaction -	Meetings	letters of invitation minutes of meetings attendance list; photos	Contractor/	BQs
Loss of biodiversity	-Avoid felling trees unless it has to;	Meeting	letters of invitation minutes of meetings attendance list; photos	Contractor	BOQs
	-establish a woodlot in the school (0.5 acre).			CPCU	25,000
Noise pollution	letters of invitation minutes of meetings attendance list; photos	Meeting/barazas	letters of invitation minutes of meetings attendance list; photos	Contractor	10,000
Air quality/particulate matter	-If drilling takes place in the dry season, vehicle speeds in the drilling area will be limited to minimize dust in the area.	signage	no of signposts erected	Contractor	BOQs
	-Discourage idling of vehicles i.e. vehicle and equipment engines will be turned off when not in direct use to reduce exhaust emissions.	Meeting	Reports/ Minutes	Contractor	BOQs
	-Regular maintenance of drilling plant and equipment.	Meeting	Reports/ Minutes	Contractor	BOQs
	-Engage well trained drilling workers.	Meeting	Reports/ Minutes	Contractor	BOQs
	-Provide Personal protective Equipment full gear including the recent due to COVID nose masks and Sanitizers to the workers on site.	Meeting	Reports/ Minutes	Contractor	BOQs
	-The drilling contractor will water the site with exposed soil surfaces twice each day during dry weather.	Sensitization on PCR Plan	Reports/ Minutes	Contractor	BOQs
Cultural property	Implement the developed chance find procedure	√Cases of chance finds; No. consultation meetings with the local cultural leaders	Reports, minutes of meetings	Contractor	
SOCIAL					

COVID-19 amongst construction workers	-The Contractors will develop a SOPs for managing the spread of Covid-19 during project execution and submit them for the approval of the Supervision Engineer and the Client before mobilization. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions;	-Barazas	letters of invitation minutes of meetings attendance list; photos	CPCU / contractor	20,000
	-Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including	-Availability of SOP(s), Training material, PPE, sanitizing facilities			
	-Avoid concentrating of more than 15 workers at one location. Where there are two or more people gathered, maintain social distancing at least 2 meters. All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs;	No of workers sensitized on COVID-19	letters of invitation minutes of meetings attendance list; photos	CPCU	10,000
	-The project shall put in place means to support rapid testing of suspected workers for covid-19;	Barazas			5,000
	-Install hand-washing facilities with adequate running water and soap, or sanitizing facilities	Hand washing facilities	No of hand washing facilities in operation	Contractor	3,000
	-Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc;			CPCU	2,000
<i>Labour influx</i>	-The Contractor to develop & implement a Labour Influx Management Plan and Workers' Camp & Accommodation Management Plans as part of C-ESMP.	Presence of an Influx Management Plan	Muster Roll; duly signed Code of conduct form for each worker/staff;	Contractor	10,000

	-All workers to sign employment contract including Code of Conduct.	Presence of a functional Grievance redress committee	Muster Roll; duly signed Code of conduct form for each worker/staff;	Contractor	
	-Establish a Grievance Committee for Workers	No. of site employees who are members of the local community	Muster Roll; duly signed Code of conduct form for each worker/staff;	Contractor	
	-Casual workers be employed from host community to reduce labour influx	No. of workers sensitized on sexual relations	Muster Roll; duly signed Code of conduct form for each worker/staff;	Contractor	
	-Establish a Grievance Redress Committee to act as link between community and the project; local leadership should always be sought as a first priority in solving issues;	Grievance Committee in place	Register on the number of grievances	Contractor	
<i>Social risk - Spread of COVID-19 amongst community members during consultations</i>	Electronic means of consulting stakeholders and holding meetings shall be encouraged whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced;	-availability of SOP(s), Training material, PPE, sanitizing facilities	letters of invitation minutes of meetings attendance list; photos	Contractor/CPCU/	5,000
	(ii) Avoid concentrating of more than 15 community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters;	-no. of participants registered/ reached online.			
	(iii) The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;	-Attendance registers of all meetings held			30,000

	(iv) Hold meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration. (v) In situations where online interaction is challenging, disseminate information through digital platform (where available) like Facebook and WhatsApp & Chart groups.	Evidence of use of electronic media for information dissemination/engagement e.g. printed electronic mails, addresses of video links created.			
Health and safety	a)The borehole will be well sealed by the contractor by providing an exclusion zone for all.	-exclusion zone provided; electric fence done; frequency of checking the electric fence; No. of rules barring underage children going near BH;	Reports; minutes of meetings;	Contractor	3,000
	b)The management will ensure that electric wiring is checked and that shocks are prevented at all costs.	Presence of an operator			
	c)Underage students and children will not be allowed near the borehole vicinity it will only be operated by an authorized person.				
Child labour	The contractor will ensure that persons under the of 18 are not engaged or employed in undertaking the project activities	No. of community sensitizations on child labour conducted/ No of participants at such sensitizations, Presence of clauses on child labour in bidding documents; Muster roll; No. of child labour reported	Reports, bid documents; labour returns; mails with Childrens' depart.	Contractor/CPCU	5,000
Gender-based violence at community level	The contractor will implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including	√Number of sensitizations on GBV	Log register; GBV Action plan; GBV reports;	CPCU/CESSCO, GBV Expert;	9,000

	-Effective and continuous community engagement and consultation, particularly with women and girls;	√ Presence of plans for reducing GBV risks	Case proceedings/verdicts		
SEA of community by project workers	-The contractor will Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).	The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in	√No of grievances registered on sexual exploitation.	Contractor/CPCU	5,000
	-Response to SEA including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management;	√ Response to SEA including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management;			
COVID-19 amongst workers	-Electronic means of consulting stakeholders and, holding meetings, whenever possible, shall be encouraged whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced;	-Barazas	letters of invitation minutes of meetings attendance list; photos	CPCU / contractor	20,000

	-Avoid concentrating of more than 15 community members at one location. Where there are two or more people gathered, maintain social distancing at least 2 meters	-Availability of SOP(s), Training material, PPE, sanitizing facilities			
	-The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;	No of workers sensitized on COVID-19	letters of invitation minutes of meetings attendance list; photos	CPCU	10,000
	-Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Ensure to provide and allow participants to provide feedback and suggestions.	Barazas			2000
HIV/AIDs and other STIs	-Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and sexual health and rights through staff training, awareness campaigns, multimedia and workshops or during community Barazas.	-Number of cases of diseases reported	Health data, reports; Muster Roll; Invitation Letters, list of attendance; proceedings; structural plans	Contractor/CPCU/MoH	15,000
	-Use existing clinics to provide VCT services to construction crew and provision of ARVs for vulnerable community members	-Rate of absenteeism due to diseases			
	-Ensure safety of women and girls in provision of VCT services	-No of workers trained on HIV/ AIDS			
	-Provide toilets within the camp	Number of gender-disaggregated toilets constructed			
	-Work to minimize or altogether eliminate mosquito-breeding sites.				
	-Provide appropriate human and solid waste				

	-disposal facilities				
Beneficiary complaints	sensitize communities; train beneficiaries; establish GRM Committee for the sub project; train GRM committee; adopt a PM&E for the sub project.	No. of complaints logged-in; no. of trainings held on GRM; No of participants who attended training (by genderer); no of complaints resolved.	Minutes of GRM meetings, photos, letters of acknowledgement and/or resolution; list of attendance; schedule of meetings	Water committee/CPCU	20,000
Security	creating employment opportunities, reducing tribalism, establish rehabs, reduce inequality, increase penalties to low breakers, increase employment, increased police presence.	Meetings	letters of invitation minutes of meetings attendance list; photos	CPCU	3,000
OPERATION					
ENVIRONMENTAL					
Underground water depletion	-Proper monitoring of number of boreholes being authorized by the Water Resources Authority within the proposed area.	-No. of BHs done against the recharge rate; amount of water by roof-harvesting; water collection point with water metre; no. of water kiosks done;	Reports, water sale returns; water kiosks done and operational;	Department of water/WARMA	-
	-The project proponent should not exceed the water usage limit per day.		Borehole Management Committee/Department of water		
	-Encourage rainwater harvesting and use that water for non-domestic uses like cleaning floors, watering flowers. Store the rainwater in tanks for future use.		Borehole Management Committee/Department of water		
	-Monitor and meter the water system to determine the largest water consumption areas (Output water meter compared to the metered water in Kiosks, watering troughs or any other user point); monitoring also can help detect leaks in water systems				

Reduced surface water flows	sensitize community to conserve the catchment through tree planting; Excavate a retention ditch around the Borehole site, so that water runoff is harvested accordingly.				
SOCIAL					
	<ul style="list-style-type: none"> •Undertake regular water testing and analysis for the presence of microbial contaminants and other foreign contaminants. 				
	<ul style="list-style-type: none"> •Ensure proper siting, location, drilling and maintenance of the borehole for this minimizes the likelihood of water contamination. 				
	<ul style="list-style-type: none"> •Direct surface drainage away from the borehole casing, and surface water should not collect near the borehole. 				
Health and safety	a.Worksite monitoring and personal protective equipment (PPE) required, as appropriate, for mechanical, noise, and potential contaminant exposure hazards. Typically, 3-5 people operate drilling equipment.	-exclusion zone provided; electric fence done; frequency of checking the electric fence; No. of rules barring underage children going near BH;	Reports; minutes of meetings;	Contractor	3,000
	b.Supply appropriate PPEs including First Aid Kits.	Presence of an operator			
	c.Train workers on emergency preparedness and response.				
	d.access medical and insurance covers for workers.				
Water contamination	<ul style="list-style-type: none"> •Maintain borehole properly. 				
	<ul style="list-style-type: none"> •Undertake regular water testing and analysis for the presence of microbial contaminants and other foreign contaminants. 	Samples and specimens from the regular tests	Reports from the samples		

	<ul style="list-style-type: none"> •Ensure proper siting, location, drilling and maintenance of the borehole for this minimizes the likelihood of water contamination. 				
	<ul style="list-style-type: none"> •Direct surface drainage away from the borehole casing, and surface water should not collect near the borehole. 				
Discrimination in employment	Contractor will hire 70% of workers locally and 30% as immigrants. The contractor will liaise with the Area Chiefs and Ward Administrators to identify the needy persons including the most vulnerable. The contractor will also give equal opportunity to all vendors.	-no. of workers engaged by contractor and % locals; no. of meetings held with workers; with vendors	Minutes of meetings; attendance list, photos;	Contractor	2,000
Child labour	-The contractor and the proponent will ensure that there is no child labour.	No. of community sensitizations on child labour conducted/ No of participants at such sensitizations, Presence of clauses on child labour in bidding documents; Muster roll; No. of child labour reported.	Reports, bid documents; labour returns; mails with Childrens' depart.	Contractor/CPCU	10,000
GBV at community level	-The contractor will implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including	Number of sensitizations on GBV	Log register; GBV Action plan; GBV reports;	CPCU/CESSCO, GBV Expert;	9,000
	-Effective and continuous community engagement and consultation, particularly with women and girls;	Presence of plans for reducing GBV risks	Case proceedings/verdicts		

	-Review of specific project components that are known to heighten GBV risk at the community level, e.g. employment schemes for women; etc.	Established referral mechanism on GBV			
	-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				
SEA of community by project workers	-Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).	The contractor will Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence	No of grievances registered on sexual exploitation.	Contractor/CPCU	25,000
	The SEA action plan will include how the project will ensure necessary steps are in place for:	√The SEA action plan will include how the project will ensure necessary steps are in place for	No. of people sensitized on sexual exploitation.		
	-Prevention of SEA: including Codes of Conducts (COCs) and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials;	√ Prevention of SEA including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials;			

	-Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of Protection against Sexual Exploitation and Abuse (PSEA) awareness-raising in all community engagement activities; community-level Information Education and Communication (IEC) materials; regular community outreach to women and girls about social risks and their PSEA-related rights;	Engagement with the community including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community			
Water-use conflicts	Calendar of use/watering of livestock; employing community committees and locals to manage the water-use; sensitization/capacity building of communities; train the water resource users on O&M; operational GRM committee; and efficient M&E activities.	-no of trainings/sensitizations done; no of participants attending; known to all watering calendar;	Schedule of use shared with communities; GRM Committee meetings; minutes and list of attendance; training proceedings and list of participants	CPCU	30,000
COVID-19 amongst community members	Electronic means of consulting stakeholders and holding meetings shall be encouraged whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced;	-availability of SOP(s), Training material, PPE, sanitizing facilities	letters of invitation minutes of meetings attendance list; photos	Contractor/CPCU/	150,000
	(ii) Avoid concentrating of more than 15 community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters;	-no. of participants registered/ reached online.			

	(iii)The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;	-Attendance registers of all meetings held			
HIV/AIDs and other STIs	-Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and sexual health and rights through staff training, awareness campaigns, multimedia and workshops or during community Barazas.	-Number of cases of diseases reported	Health data, reports; Muster Roll; Invitation Letters, list of attendance; proceedings; structural plans	Contractor/CPCU/ MoH	15,000
Beneficiary complaints	Sensitize communities; train beneficiaries; establish GRM Committee for the sub project; train GRM committee; adopt a PM&E for the sub project.	No. of complaints logged-in; no. of trainings held on GRM; No of participants who attended training (by genderer); no of complaints resolved.	Minutes of GRM meetings, photos, letters of acknowledgement and/or resolution; list of attendance; schedule of meetings	Water committee/CPCU	20,000
Security	Creating employment opportunities, reducing tribalism, establish rehabs, reduce inequality, increase penalties to low breakers, increase employment, increased police presence.	-exclusion zone provided; electric fence done; frequency of checking No. of rules barring underage children going near BH;	Reports; minutes of meetings;	Contractor	3,000
DECOMMISSIONING					
ENVIRONMENTAL					
Dilapidation of infrastructure overtime	Demolish all the structures including pump house, pipe works; remove the salvage materials.	No of structures demolished; sort solid waste appropriately;	Instructions/orders in written form; waste disposed off accordingly	Contractor	
SOCIAL					
Health and safety of workers	Personal protective equipment (PPE) required, as appropriate, for mechanical, noise, and potential contaminant exposure hazards.	-exclusion zone provided; electric fence done; frequency of checking the electric fence; No. of	Reports; minutes of meetings;	Contractor	3,000

		rules barring underage c			
	Supply appropriate PPEs including First Aid Kits.				
COVID-19 amongst community members	<p>ii) Avoid concentrating of more than 15 community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters;</p> <p>(iii)The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;</p>	.			10,000
	TOTAL				455,000

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

The study finds the project is acceptable if the identified and developed management plans and practices are implemented accordingly. It also recommends appropriate monitoring of the project development and operational activities to ensure that adverse impacts that were unforeseen are identified and addressed in a timely fashion.

Specifically, the following recommendations are made:

- ❖ The proponent and the client be involved in every stage of the project implementation and particularly on the management of the anticipated wastes & emissions into the environment as well as other concerns that may touch on the neighbors especially control of noise & waste management.
- ❖ That the project is implemented as described and the management plan implemented to the letter.
- ❖ That the project implementation will not cause any unnecessary disruption to public utilities, storm water/surface runoff drainage systems, ecological systems & human settlement.
- ❖ Conservation measures are implemented that ensure sustainable use of energy and natural resources.
- ❖ Annual Environmental Audits are conducted every year by NEMA registered experts so as to confirm the status of the compliance with the relevant legislation and implementation of the Environmental management plan.
- ❖ Wastewater can be recycled and used in the drilling process, domestic effluent can also be treated and recycled and sludge from site for safe disposal at a designated disposal site.
- ❖ Provision of suitable facilities for the collection, segregation, and safe disposal of the wastes. Waste should be segregated in terms of recyclable, reusable, biodegradable, non-biodegradable and providing equipment for handling waste.
- ❖ Impose and enforce speed limits and provide driving guidelines for vehicle operators.
- ❖ Inform local residents beforehand, via notices and advisories, of pending noisy periods and solicit their tolerance well before the commencement of any activities.
- ❖ Employing an Occupational safety and health (OSH) plan that will outline all OSH risks and provide a strategy for their management.
- ❖ Employ a Grievance Redress Mechanism to record any complaints made by surrounding community members, and procedures to respond on the same.

The proposed project will have several positive economic benefits during its different phases and it will also have negative impacts. However, these impacts are synonymous with development project and can adequately be mitigated through the implementation of the ESMP prepared. The project is important for economic development and its benefits outweigh its shortcomings. We therefore recommend that the project be licensed

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ANNEXES

ANNEX 1: MINUTES OF MEETING

MINUTES OF THE COMMUNITY BARAZA/MEETING ON PROPOSED BOREHOLE CONSTRUCTION IN DUSOT AREA IN CHERAP WARD ISIOLO NORTH SUB-COUNTY, ISIOLO COUNTY. HELD ON 10th June , 2021 AT DUSOT VILLAGE AT 10.00 AM

Members Present:
List attached

Agenda
Project Brief
Community Sensitization on ESIA
Public participation
AOB

Min 1./10/6/2021: **Introduction**

The meeting started at 8.00 a.m. with a word of prayer from Abdirahman Ahmed. Thereafter the Chairperson thanked member for availing themselves on time to the meeting. He then called the meeting to order.

Min 2./10/6/2021: County **Project Coordinator Mr Kirimi**

The County Project Coordinator who was present took time to explain Kenya climate smart agriculture project and its objective s
The officers emphasized on the importance of public participation. The proposed project will contribute towards achievement of KCSAP development objective of “increased agricultural productivity and building the resilience to climate change risks in the targeted smallholder farming and pastoral communities in Kenya, and in the event of an Eligible Crisis or Emergency, to provide immediate and effective response.”
Officers from Kenya Climate smart Agricultural Project explained the importance of carrying out an environmental impact assessment. This exercise is very important because it informs the contractor on the anticipated risks and mitigation measures take to reduce the impact of the risk.

Min 3./ 10/6/2021: **Community Consultation/Sensitization on ESIA**

The ESIA expert mentioned the need for public participation in Environmental Impact Assessment as a priority and legal requirement by the Government of Kenya, He enlightened the meeting about ESIA ; its purpose objectives; legal framework including legislation and policies governing environment; the rights and role of community towards environmental protection and management. He further took the community through selected legislation governing the environment including the new constitution
The community was informed that it is mandatory to hold at least one baraza to give the community/neighbours/stakeholders an opportunity to present their views with respect to the

benefits; impacts both negative and positive in order to establish whether the project is economically viable, socially accepted and environmentally friendly/sound

Min 4./ 10/6/2021: **Comments from the Community members**

The participants agreed to that plans of drilling Dusot borehole should continue. They insisted that the process should start immediately now that drought has started seriously.

The community members asked about the running of the borehole. i.e who will run the bore. The concerned officers told them that the management committee would collaborate with the community to make sure that activities at the borehole are well done and maintain ace is done.

The community members were given time to air out their views as far as environmental impact is concerned. One member said that the idea was very good so long as the contractor puts consideration locals when employing the workforce during the implementation of the project. They expressed their fear of not having skilled workers but many men women and men who could carry out unskilled labour.

During the meeting, the issue of pasture grazing conflicts came out strongly. The neighbouring County of Marsabit normally bring their livestock for grazing and watering and this when conflicts erupt as both parties never agree on however grazing procedures.

The other issue raised was on the wildlife menace which could lead to the destruction of constructed structures.

Min 5./ 10/6/2021: Community participation

The ESIA lead expert guided the community members on procedures of giving their opinion and that each speaker was to follow but not limited to the following criteria:

Personal identification by: location names, age, gender, mobile telephone number

Indicate whether he or she is aware of the proposed borehole construction and its related activities incidental thereto and connected therewith the under the Resilience Project? Yes/No

Give opinion on the expected benefits from the borehole project

Give opinion on the anticipated negative/adverse impacts that may result from this project and related activities

Propose mitigation measures to avoid, alleviate or reduce the adverse effects

Identify any conflict, complaints expected to arise due to bore hole construction

Suggest ways to resolve conflict, complain amicably

Indicate other issues relevant to the implementation of the borehole project

The community beneficiary opinions were documented below:

All the participants affirmed by show of hands that they have heard of the borehole project. They also confirmed that they are aware that this is a project being coordinated by the state department of Agriculture and Livestock while implementation will be undertaken under supervision of a management committee in place.

The participants in the meeting also affirmed that they are aware the borehole project and expect to immensely benefit from it upon its full completion.

The community members affirmed that they were consulted and that they did request for establishment a borehole in their area in order to enhance water accessibility and availability for domestic and livestock use. It will build their resilience through availability of ice at a short distance for both the marketing of fish and domestic use.

When participants were asked about benefits of proposed borehole, they identified the following;

Employment creation

Clean water

More time to spend on other activities and reduce time to fetch for water
Provide water for livestock
There will be reduced incidences of livestock losses due to starvation
Income to households will rise and food security status of the communities will be enhanced

Min 6./ 10/6/2021: Possible adverse effects of the project and suggested mitigations

The community were unanimous that there will be no serious negative environmental impacts resulting from the borehole construction activity.

However, some minimal environmental degradation as a result of selective bush cutting and thinning might occur while opening the area for excavating the cold storage facility and construction of sanitary facilities

There will be removal of selected vegetation creating open spaces that would be used for pasture development,

However the removed vegetation would be mitigated by planting palatable indigenous palatable vegetation that would still cover the soil around the catchment areas.

Establishment a borehole management committee to coordinate access and utilization of the facility.

Min 7./10/6/2021: A.O.B

OWNERSHIP OF THE LAND TO BE OCCUPIED BY THIS PROJECT INVESTMENT?

The Community participants reaffirmed that the land belongs to the community and no individual person in the community could claim ownership of the land. The ESIA Expert then informed the community that they would be expected to put their names down to show that they were consulted and they agreed that they would have this project implemented in their area.

CONSENT

The participants reaffirmed that the land where the borehole will be constructed is a communal land held in trust by the county government of Isiolo and no individual person in the community can claim ownership of the land.

RESOLUTION

The NEMA Expert thanked the Community for giving consent for project implementation. He stated that the Community response to the ESIA exercise will go to the experts to facilitate issuance of other certification as the case may arise.

CLOSING REMARKS

The Chief Officer in-charge of Livestock Production and Fisheries thanked the participants for attending the meeting and informed that he will be available frequently during project implementation to monitor progress. He noted that success of the project depends on all stakeholders The Management Committee from the community must remain as a family and know that there will be maintenance cost.

There being no other business to discuss to discuss, the meeting was closed with a word of prayer by Yossuf Jarso at 2.30 pm.

ANNEX IV LIST OF PARTICIPANTS

Procurer - Procurement - Madhavapalle Gavelokan
10/6/2021.

S/NO.	NAME	ID/NO.	GENDER	CONTACT EMAIL/PHONE	SIGNATURE
9.	Goblo DIDA IMAKE	0366844	M	0714776681	
10.	SALAD MUSEIN BONAYIA	23037446	M	0702822606	
11.	ABDUBA KAKO KIVAYIO	0008929	M	0700992792	
12.	WAKO DINA KAKO	34220979	M	0705329154	
13.	ABDURAHMAN JASSO IYAFI	0011708	M	0716789638	
14.	JUMAE IJEE BAKAWA	26689766	M	0795457632	
15.	ABDULMAN KUTO JASSI	8889774	M	0793520595	
16.	MUSSEIN JASSO KZI	0009838	M	0706790081	
17.	MUSA ABDUBA WAKO	36258954	M	0712416440	
18.	MUSSEIN WAKO BUREU	9855484	M	0746108758	
19.	ABDUBA KUTI HAWA	21094218	M	0798564374	
20.	KADI DIDA MOJALE	7767914	M	0708259837	
21.	IKDATHAN SAMA DIBA	25777666	M	076673696	
22.	KADMASTAD GORSE TILLO	8889911	M	0706790081	

Palace Punt-empalawa Al-aluq-1-polo Berekhale
 10/6/2021.

S/NO.	NAME	ID/NO.	GENDER	CONTACT EMAIL/PHONE	SIGNATURE
9.	JAFI'ANI KILI KUNYO	4825265	M		JAFI'ANI
10.	AMIRA JAFI'ANI	0011762	F	0712366922	AMIRA
11.	ZELINKAU BRIGALO	0009966	F		ZELINKAU
12.	GAJGALO DABESO KUNYO	0010014	M		GAJGALO
13.	HAFI'IN WAKO	7872750	F	0719414409	HAFI'IN
14.	MED GUBELA GORSE	7873511	M	0790773537	GUBELA
15.	FAYUMA ABDUWA JAFI'ANI	21628660	F	0742415546	FAYUMA
16.	KLAKO BOKU JAFI'ANI	0011151	M		KLAKO
17.	JAMILA MOHAMMAD WAKO	7872713	F	0790773590	JAMILA
18.	GARD KULLU BARAWA	3645114	F	0740739557	GARD
19.	HAWO GUNYO HAWALE	0009563	F	0759441442	HAWO
20.	KULA HALIMO HAFI'IN	0010989	F	0759358190	KULA
21.	KILI HUKA	0008735	M	0717103029	KILI
22.	DASHUD KILI HUKA	25991310	M	0789858420	DASHUD

reference participation

Madangyale Biko

10/12/2021

S/NO	NAME	ID/NO.	GENDER	CONTACT EMAIL/PHONE	SIGNATURE
9.	Galhelo Aekulo Bony	219804849	M		
10.	Mohamed Tadar Faido	21093485	M	09451408	
11.	Almer. Fadi Guyo	21223342	M	0910598324	
12.	Fetun. Babt	22844976	F.	0719798046	
13.	Imri. Abdul qjege	22871478	M	0727880619	
14.	Fusuf Tomah-Ingida	25690992	M	0742116337	
15.	Habesad Galado Bony	249080451	M	071544725	
16.	Abulhari Guwa Jaro	25353224	M	0713580378	
17.	Ade. Rda Fevo	24508490	M	0921269873	
18.	Abdulali Tacho Faido	25711972	M	0724159251	
19.	Hawo mohu. Robo	223889940	F.	0724158856	
20.	Adal. Amulya Raba	24774306	M	0918503777	
21.	Maro Samehugo	24683866	M	0902957961	
22.	Yume Bony elle	24369024	F		

Pulvine Bankruptcies - M and O - pulvine Bankruptcies

10/6/2021

S/NO.	NAME	ID/NO.	GENDER	CONTACT EMAIL/PHONE	SIGNATURE
9.	Amin Aklala	24392368	F	0724	Amin
10.	Galgado Hugo Arano	22891135	M		
11.	Feluna Aekalla's Bony	0185824	F	0742927696	HDDID
12.	Fadila dora Kirpana	2982497	F	0748952661	MSRM
13.	Mervin Mohamed Dera	03645504	F	0759358252	TRBIBR
14.	Habib Gaus' Galane	5367024	F	0742927696	KABER
15.	Kadunio Abdan	0009798	M	0729507987	Kmms
16.	Aminia Ivin Gupa	0610605	F	0701520998	Kmms
17.	Bashir Jinnis Gup	2929811	M	0798613993	BIRHQR
18.	Abdul Borna's Gaus	21095129	M	0721277919	ASBUBR
19.	Amin's Bura Shams	9855617	F	0790964124	AMUDR
20.	Saamil Hessa' Mlu	2451877	F	072791034	SMTML
21.	Hawzi Dabusi	36884770	F	0707525333	KABER
22.	Sara' Khalid Kim	2669467	F	0723019218	SARER

ANNEX 1V SCREENING CHECKLIST

Boze Hole - Madabagalala

KCSAP ISIOLO COUNTY -ESS SCREENING CHECKLIST

ENVIRONMENTAL AND SOCIAL SCREENING CHECKLIST ESM SUB-PROJECTS SCREENING CHECKLIST (SUB-PROJECTS SCREENING PROCESS BY BENEFITTING COMMUNITIES/AGENCIES)

Section A: Background information

Name of County.....	Isiolo
Name of CSU/Monitoring Officer/Researcher	Mohamed Dabas
Sub-project location.....	Sericho (Sericho)
Name of CBO/Institution.....	
Postal Address:.....	
Contact Person.....	Mohamed Dabas
Cell phone:.....	
Sub-project Name.....	Boze Hole
Estimated cost (KShs.).....	
Approximate size of land area available for the sub-project.....	
Objectives of the subproject.....	1 acre Mainly for livestock watering. This is the only water point in the pasture area
Activities/enterprises undertaken.....	
How was the sub-project chosen?.....	
Expected subproject duration:.....	

Section B: Environmental Issues

Will the sub-project:	Yes	No
Create a risk of increased soil erosion?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Create a risk of increased deforestation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Create a risk of increasing any other soil degradation	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Affect soil salinity and alkalinity?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Divert the water resource from its natural course/location?	<input type="checkbox"/>	<input type="checkbox"/>

KCSAP ISIOLO COUNTY –ESS SCREENING CHECKLIST

Will the sub-project:	Yes	No
Be located within or near environmentally sensitive areas (e.g. intact natural forests, mangroves, wetlands) or threatened species? NB: If the answer is yes, the sub-project should not proceed.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Adversely affect environmentally sensitive areas or critical habitats – wetlands, woodlots, natural forests, rivers, protected areas including national parks, reserves or local sanctuaries, etc.)? NB: If the answer is yes, the sub-project should not proceed.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Affect the indigenous biodiversity (flora and fauna)? NB: If the answer is yes, the sub-project should not proceed.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cause any loss or degradation of any natural habitats, either directly (through project works) or indirectly? NB: If the answer is yes, the sub-project should not proceed.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Affect the aesthetic quality of the landscape?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reduce people's access to the pasture, water, public services or other resources that they depend on?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Increase human-wildlife conflicts?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Use irrigation system in its implementation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

NB: If the answers to any of the above is 'yes', please include an ESMP with sub-project application.

SECTION E: Pesticides and Agriculture Chemical

Will the sub-project:	Yes	No
Involve the use of pesticides or other agricultural chemicals, or increase existing use?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cause contamination of watercourses by chemicals and pesticides?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cause contamination of soil by agrochemicals and pesticides?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Experience effluent and/or emissions discharge?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Export produce? Involve annual inspections of the producers and unannounced inspections?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Require scheduled chemical applications?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Require chemical application even to areas distant away from the focus?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Require chemical application to be done by vulnerable group (pregnant mothers, chemically allergic persons, elderly, etc.)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If the answer to the above is 'yes', please consult the IPM that has been prepared for the project.

KCSAP ISIOLO COUNTY -ESS SCREENING CHECKLIST

Section F: Vulnerable and Marginalized Groups meeting requirements for OP 4.10

Are there:	Yes	No
People who meet requirements for OP 4.10 living within the boundaries of, or near the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Members of these VMGs in the area who could benefit from the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
VMGs livelihoods to be affected by the subproject?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If the answer to any of the above is 'yes' please consult the VMGF that has been prepared for the project.

Section G: Land Acquisition and Access to Resources

Will the sub-project:	Yes	No
Require that land (public or private) be acquired (temporarily or permanently) for its development?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Use land that is currently occupied or regularly used for productive purposes (e.g. gardening, farming, pasture, fishing locations, forests)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Displace individuals, families or businesses?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Result in temporary or permanent loss of crops, fruit trees and pasture land?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Adversely affect small communal cultural property such as funeral and burial sites, or sacred groves?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Result in involuntary restriction of access by people to legally designated parks and protected areas?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Be on monoculture cropping?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If the answer to any of the above is 'yes', please consult the mitigation measures in the ESMP, and if needed prepare a (Resettlement Action Plan) RAP.

Section H: Proposed action

(i) Summarize the above:	(ii) Guidance
<input type="checkbox"/> All the above answers are 'No'	<ul style="list-style-type: none"> If all the above answers are 'No', there is no need for further action;

KCSAP ISIOLO COUNTY -ESS SCREENING CHECKLIST

<input type="checkbox"/> There is at least one 'Yes'	<ul style="list-style-type: none">• If there is at least one 'Yes', please describe your recommended course of action (see below).
--	--

(III) Recommended Course of Action

If there is at least one 'Yes', which course of action do you recommend?

- CPCUs and CDE will provide detailed guidance on mitigation measures as outlined in the ESMF; and
- Specific advice is required from CDE¹, Lead Officer and CPCUs regarding sub project specific EIA(s) and also in the following area(s)
- All sub-project applications/proposals MUST include a completed ESMF checklist. The KCSAP-CPCU and CDE will review the sub-project applications/proposals and the CDEs will sign off;
- The proposals will then be submitted to NPCU for clearance for implementation by communities in the proposed subprojects.

Expert Advice

- The National Government through the Department of Monuments and Sites of the National Museums of Kenya can assist in identifying and mapping of monuments and archaeological sites; and
- Sub-project specific EIAs, if recommended, must be carried out by experts registered with NEMA and be followed by monitoring and review. During the process of conducting an EIA the proponent shall seek views of persons who may be affected by the sub-project. The WB policy set out in OP 4.01 requires consultation of sub-project affected groups and disclosure of EIA's conclusions. In seeking views of the public after the approval of the sub project, the proponent shall avail the draft EIA report at a public place accessible to project-affected groups and local NGOs/CSOs.

Completed by: <u>MOHAMED R. DABASSO</u>	
Position / Community: <u>CHIEF</u>	
Date: <u>11th June 2021</u>	

¹ County Director of Environment and the County Technical Team

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

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

License No : NEMA/EIA/ERPL/14707

Application Reference No: NEMA/EIA/EL/19234

M/S **BONFACE MANYARA KOOME**
(individual or firm) of address

P.O. Box 06-60300 ISIOLO

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **2534**


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

Issued Date: **4/9/2021**

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



Signature.....

(Seal)

Director General
The National Environment Management Authority

