



**COUNTY GOVERNMENT OF ISIOLO, DEPARTMENT OF LIVESTOCK
PRODUCTION AND FISHERIES
DIVISION OF FISHERIES**

ENVIRONMENTAL IMPACT ASSESSMENT SUMMARY PROJECT REPORT

FOR

**THE PROPOSED DRILLING OF QUONE BOREHOLE IN HABASWEIN,
GARBATULA SUB COUNTY**



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We appreciate the co-operation and contribution of all the stakeholders who we interacted with during the EIA study. Without their support this study would not have been successful.

Finally, we wish to appreciate the contribution made by the entire community for providing us with useful information by assisting in identifying the proposed site and by filling out questionnaires during the field visits to the project area.

EXECUTIVE SUMMARY

This document is an Environmental and Social Impact Assessment (ESIA) Summary Project Report (SPR) for the proposed drilling and construction of Quone borehole in Habaswein, Garbatula Sub County, Isiolo County. The project will contribute to provision of water for domestic and livestock use and improving the livelihood of the Quone livestock keepers who are pastoralists. It will be implemented by the Quone borehole management committee. The overall objective of the project is drilling a borehole in Quone village, to provide reliable water for both domestic and livestock. Approximately 20.0m³ per day is expected to augment the water supply. The proposed project location is Quone village, Habaswein, Garbatula Sub County, Isiolo County: UTM 37N 538971mE; 108479mN (Longitude 39.3502750E, Latitude 0.9814320N). The main objective is to improve livestock productivity and income through reliable water supply. The main livestock types kept are cattle, camels, donkeys sheep and goats. The project targets an estimated livestock population of Cattle, (10,000) Sheep and Goats (20,000), Camels (2,000) and Donkeys: (300) in the area.

The proposed project on the basis of its potential to pose both environmental and social impacts require undertaking of an ESIA before it is implemented in accordance to Section 31 (3) (a) (i) and (ii), of the Environmental (Impact Assessment and Audit) Regulations, 2003. The Summary Project Report (SPR) was as a result of the recommendation of the County Director Environment (CDE) based on the screening report and also because NEMA Public Notice on ESIA and Legal Notice No. 31 which identifies the proposed project as Low risk, thus requiring only Summary Project Report (SPR).

The Quone livestock keeping community through Kenya Climate Smart Agriculture Project (KCSAP), Isiolo County Government, consulted environmental experts licensed by the Authority to conduct an Environmental Social Impact Assessment (ESIA) study for the proposed project and prepare a Summary Project Report (SPR) for submission to the National Environment Management Authority (NEMA) for review and licensing or for further guidance.

The assessment was carried out in late December 2020. It involved screening to ascertain the environmental sensitivity of the proposed site and its surroundings in relation to the planned activities; site visits to physically inspect and document existing facilities at the site and natural and socio-economic features of importance; scoping in order to narrow down to the most critical environmental and social issues requiring detailed evaluation; public participation in order to collect the views of the stakeholders on the proposed project; and desktop studies

Some of the policies and legal regulatory frameworks that are applicable in implementation of the project are: National Policy for Disaster Management in Kenya 2009, Constitution of Kenya 2010, The Sustainable Development Goals , National water policy, National Land Policy , HIV and AIDS Policy 2009, Gender Policy 2011. The Acts of Parliament are Environmental Management and Coordination Act (EMCA) 1999 amended in 2015, Public Health Act (Cap.242), The Community Land Act, 2016 Water Act 2002 amended in 2016 ,Environmental and coordination (water quality) regulation, Physical Planning Act 1996 (286) , Occupational Health and Safety Act (OSHA 2007), Works Injuries and Benefits Acts (2007) The World Bank Environmental and Social Safeguard Policies World Bank OP 4.01

on Environment Assessment, WB OP 4.10 on Indigenous Peoples, WB OP 4.12 on Involuntary Resettlement, WB OP 4.04 on Natural Habitants , World Bank Group Environment, Health and Safety Guidelines

The proposed project cost is estimated at of KES 15,000,000. The implementation of the ESMMP is included into the Bill of Quantities (BOQ). The proposed project activities will involve drilling encasing and equipping the borehole. Quone BH will be 203mm (8”) in diameter and a minimum of 220 m depth. In addition the project will also involve construction/installation of elevated water tank (50,000m³) for water storage at a site well consulted. The project is anticipated to have both positive and negative impacts. The positive impacts are creation of employment opportunities during construction and operation phases,. Increased access to water for livestock and domestic use. It is expected that there will be Improvement of micro economy of local communities through direct and indirect businesses. There are notable water resource users associations that need to be strengthened.

However negative impacts anticipated are: loss of vegetation, **soil erosion:** -during the excavation and construction. Increased generation of waste, Increased noise levels: **Exhaust and gaseous emissions Dust pollution, Noise and vibration The Social Impacts:-** encompass Health and safety risks of contracting COVID-19 virus, likely increase in incidences of HIV/AIDS and increased cultural contamination among the local communities including potential for child labor, sexual harassment, gender based violence. Risk of Accidents at Work Sites. Among the mitigation measures proposed in this report are: Site Clearance and Construction activities will be limited to the area set-out by the Project engineer, Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to designated Solid Waste, Contractor will comply with provisions of EMCA 2015 (Noise and Excessive Vibrations Regulations of 2009), Provide Personal Protective Equipment (PPE) including gloves, gum boots, overalls and helmets to workers, use of PPE to be enforced by the Supervising Engineer. On COVID 19 adhere to strict health guidelines by wearing face masks, sanitization, minimize the number of gatherings to 15 and keeping social distance to about 1.5 meters apart.

The study has proposed several measures to reduce negative impacts including amelioration of social negative impacts, noise abatement, waste management, reduction of visual intrusion, reduction of soil erosion, prevention of accidents and health hazards. Monitoring has been identified as an important process in the protection of environment of the project area since it will reveal changes and trends brought about mainly by construction activities.

The project is recommended for implementation provided the mitigation measures identified in the study for the potential negative impacts are implemented, the recommendations will also form part of the approval by the National Environmental Management Authority (NEMA) and annual Environmental Audits

ACRONYMS / ABBREVIATIONS

ASALS	Arid and Semi-Arid Lands
A.S.L	Altitude above sea level
CBD	Convention on Biological Diversity
CDIP	County Development Integrated Plan
EA	Environnemental Audit.
EIA	Environnemental Impact Assissent.
EMCA	Environmental Management Coordination Authority.
EMP	Environmental Management Plan.
EMPs	Environmental Management Plans.
FGD	Focused Group Discussion
KFS	Kenya Forest Services
KWS	Kenya Wild services
NEMA	National Environmental Management Authority.
NEAP	National Environmental Action Plan.
NPEP	National Poverty Eradication Plan
PAPs	Project Affected Persons (PAPs)
OSH	Occupational, Safety and Health
OSHA	Occupational, Safety and Health Act.
ASALs	Arid and Semi-Arid Lands
ToR	Terms of Reference.

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CHAPTER ONE: INTRODUCTION

1.0 Introduction

Water in Isiolo is a scarce resource. Current water sources are rivers that flow through the county from the neighbouring highlands, water pans, Boreholes and Shallow wells. Most centres in Oldonyiro ward as Noloroi, Mokori and Lengweny, and parts of Habaswein, Garbatula Sub County have a serious water shortage. The breakdown is rampant in the strategic reserve boreholes. Therefore, key to their sustainability is involvement and inclusion of all stakeholders and beneficiaries at all phases of the project cycle (King-Okumu et al., 2016).

During dry season season, there is increased average distances to water and pasture. Demand for water increases and conflicts due occur. Among the potential conflict areas is Quone that experiences livestock migration within the drought reserve zones due to limited pasture and water. The proposed Quone BH in Habaswein area would therefore, reduce the issue of water scarcity for both livestock and domestic use. In addition, the resource-use-conflicts would also be reduced a great deal.

The Kenya Climate Smart Agriculture project has sensitized the Quone community with a view to supporting construction and installation of the Quone BH which was proposed by the community in a participative and all-inclusive manner. The Proposed sub project falls under Legal Notice No. 31 which identifies the proposed project as Low risk, thus requiring only Summary Project Report (SPR). Before the **EIA** was undertaken the following works and study were initiated:-

- Siting the investment project location at Quone in Garba Tula Sub-County.
- Screening exercise of the proposed borehole was been done
- Design of the works to be undertaken.
- Feasibility study report on the site was done.

1.1 Project background and context

The purpose for which the Quone borehole project is to enhance domestic water availability and promote rangeland utilization for increased livestock productivity and climate change mitigation and adaptation.

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. The construction of the borehole will up-scale Climate-Smart Agriculture (CSA) Practices and resilience of the community.

Justification

The project is expected to extract reasonable volumes of water for domestic and livestock use at a maximum 20 cubic meters/day. Currently, the beneficiaries of this project usually get water by scooping wells in the dry seasonal river beds located about 600m to the south of the village. The water is stagnant and therefore not suitable for drinking if a better water supply source is availed.

The proposed drilling and equipping sub-project has more positive impacts on the community than negative impacts: 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. The Subproject is in line with the overall national development objectives of the Government of Kenya, such as accelerated economic growth and rising productivity of all sectors, equitable distribution of national income, alleviation of poverty through provision of basic needs, enhanced agricultural production, industrialization, accelerated employment creation and improved rural-urban balance. It is particularly in line with the National Policy on development of the arid and semi-arid lands and Isiolo County integrated development plan (CIDP).

Quone borehole project was proposed by the livestock keeping communities in order to empowered communities, exploit livestock potential and improve value chains. It is expected that there will be improved resilience through livelihood initiatives and sustainable local economies will be promoted.

1.2 Purpose of Summary Project Report

The assessment has been conducted in compliance with Legal Notice No. 31 which identifies the proposed borehole project as Low risk, thus requiring only Summary Project Report (SPR). The Environmental and Social Impact Assessment (ESIA) is expected to achieve the following objectives:

- To identify all potential significant environmental and social impacts of the proposed Project and recommend measures for mitigation.
- To assess and predict the potential impacts during site preparation, construction and operational phases of the project.
- To verify compliance with environmental and social regulations.
- To generate baseline data for monitoring and evaluation of how well the mitigation measures will be implemented during the project cycle.
- To allow for public participation.
- To give an Environmental Management Plan to mitigate the identified impacts so as to ensure sustainability of the proposed Project.
- To recommend cost effective measures to be implemented to mitigate against the expected impacts.

1.3 Terms of reference

TOR outlining the expectations of the ESIA were documented by the Proponent and the ESIA team in accordance with the requirements of the Environmental (Impact Assessment and Audit) Regulations, 2003 in order to lay a basis for the assessment. The following were done to achieve the TOR:

- Described the location of the proposed project especially the physical area that may be affected by the project's activities.
- Identified and described the materials to be used, products and by-products, including wastes to be generated in all phases and the methods of their disposal.
- Undertook a public participation and consultation process in order to obtain views and comments from interested and affected persons.
- Identified and evaluated the environmental, economic and socio-cultural impacts of the proposed project to the local community and the nation in general.

-
- Identified mitigation measures to the identified impacts in order to ensure the health and safety of the workers, and neighboring communities throughout the project cycle.
 - Developed comprehensive environmental and social management and monitoring plans for the proposed project covering all its phases upon which all mitigation/enhancement measures will be carried out.
 - Prepared this SPR and necessary soft and hard copies for submission to NEMA.
 - Development of an Environmental Management Plan and an Environmental Performance Monitoring Phase

1.4 Assessment Methodology of ESIA

This assessment was carried out in December 2020 in accordance with the procedure outlined in the Environmental (Impact Assessment and Audit) Regulations, 2003 and involved:

- a) Screening: The site of the proposed project, the environmental sensitivity of the areas surrounding the proposed site, the activities of the proposed project, the nature of community and expected social issues as a result of the proposed project were evaluated to confirm whether or not it fell within a category that requires an ESIA before commencement and the level of ESIA that it would be subjected to. A screening checklist for the proposed project is attached (Annex III).
- b) Site visits: To physically inspect and document existing facilities at the site and natural and socio-economic features of importance.
- c) Scoping: The ESIA team accompanied by officials from KCSAP Isiolo County conducted a reconnaissance survey at the site..
- d) Public participation: This was done through a meeting with members of Quone livestock keeping Community and other beneficiaries including the neighboring residents where a total of 62 people attended; and administration of questionnaires to 15 randomly selected area residents. There were consultations with representatives from KCSAP Isiolo NEMA Isiolo and officials of the Quone livestock keeping community. The filled-in questionnaires from the interviews are attached (Annex IV). The lists of attendance and the minutes of the public meeting are also attached (Annex III and Annex II) respectively.
- e) Desktop studies: The ESIA team reviewed documents related to the proposed project including the proposal by the community and design documents among other documents in order to understand the project background and its context.

1.3.2 EIA field visit

The EIA field studies, desk data collection, community participatory meeting and analysis were undertaken from 4th to 20th December 2020. The purpose was to generally evaluate the types, mode of action, dynamics and magnitude of the specific projected effects and impacts, both favorable and detrimental to the environment and natural resources at the project site

1.3.3 Data analysis

All data and information collected during the process of assessment was processed and analyzed to extract useful information. It involved extraction of relevant information from the filled questionnaire, interviews with people on site and the prevailing conditions on the state of the environment

1.4 Structure of the report

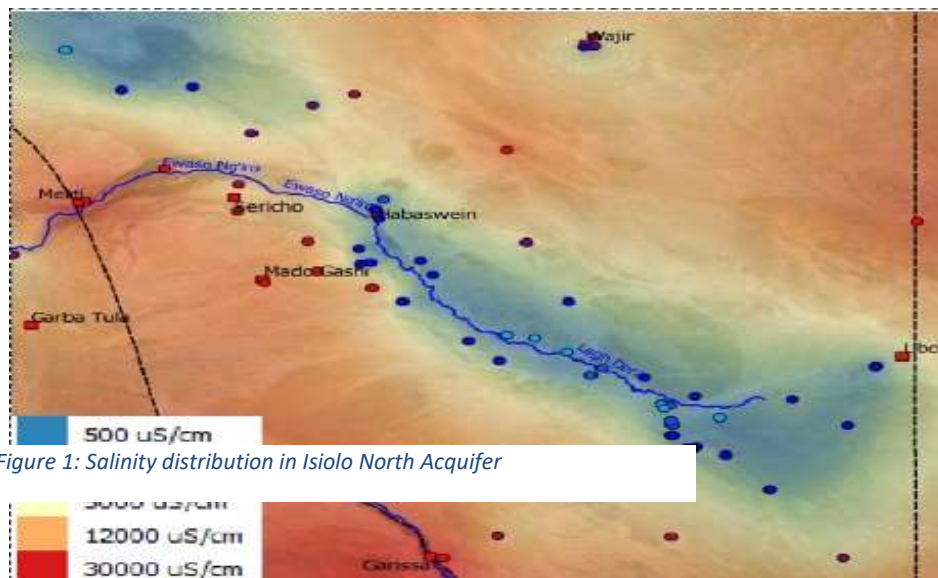
The report is organized into nine substantive chapters. Following this Chapter 1 introductory Chapter, Chapter 2 discusses nature of project. Chapter 3 gives location of the project, chapter 4 Public Participation & Stakeholder Consultations. Chapter 5 Potential Impacts and Mitigation Measures. Chapter 6 Environmental and Social Management& Monitoring Plan (ESM&MP) Chapter 7 Conclusion and Recommendation chapter 8 References Chapter 9 Annexes

CHAPTER 2: NATURE OF THE PROJECT

2.0 Introduction

The proposed project will involve drilling and equipping Quone borehole located in Habaswein area, Garbatula Sub County, Isiolo County.

Groundwater resources near Habaswein include pans, shallow wells and boreholes. Groundwater occurs in shallow aquifers as well as in deep aquifers in the area. Shallow aquifers can be found in the alluvium beneath and along (ephemeral) riverbeds, where they occur as shallow groundwater bodies. Boreholes that tap into the deeper aquifers have variable yields and water quality (salinity Figure 1).



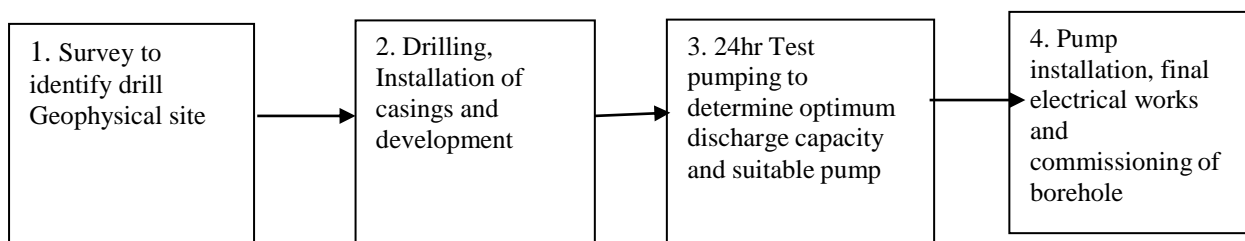
The Scope of works entails the following activities:

- ✘ Conducting an Hydro geological survey (Survey report attached)
- ✘ Application for Authorization to drill from the Water Resources Management Authority
- ✘ Drilling the borehole
- ✘ Installation of gravel pack
- ✘ Test pumping
- ✘ Recovery testing
- ✘ Installation of permanent surface casing
- ✘ Water quality analysis
- ✘ Installation of pump and commissioning of the borehole
- ✘ Installation of of an elevated 50,000m³ tank.

2.1 Project design

2.1.1 Project Activities

The borehole drilling process follows four main steps outlined below;



Drilling is expected to commence upon approval of the present project by relevant statutory authorities, including issuance of an ESIA license. The process will involve the use of a Down the Hole Rotary Drill System, which is suitable for the geological terrain. The borehole will be drilled at 8" diameter (minimum), to a maximum depth of 100m, as per the recommendation of the hydro-geologist.

Drilling

Drilling should be carried out with an appropriate tool - either percussion or rotary machines will be suitable, though the latter are considerably faster and have a low noise level. Geological rock samples should be collected at 2 meter intervals. Struck and rest water levels and if possible, estimates of the yield of individual aquifers encountered, should also be noted.

Well Design

The design of the well should ensure that screens are placed opposite the optimum aquifer zones. (See **Annex VI**). The final design should be left in the hands of an experienced driller or hydro-geologist.

Casing and Screens

The well should be cased and screened with appropriate steel casings and screens as per the design given above. In comparatively shallow wells, uPVC casing and screens of 5" or 6" diameter may be adequate. Slots should be 1 mm in size.

Gravel Pack

The use of gravel pack is recommended within the aquifer zone, because the aquifer could contain sands or silts which are finer than the screen slot size. An 8" diameter borehole screened at 6" will leave an annular space of approximately 1", which should be sufficient. Should the slot size chosen be too large, the well will 'pump sand', thus damaging pumping plant, and leading to gradual 'siltation' of the well. The grain size of the gravel pack should be an average 2-4 mm.

Well Construction

Once the design has been agreed upon, construction can proceed. In installing screen and casing, centralizers at 6 meter intervals should be used to ensure centrality within the borehole.

This is particularly important if an artificial gravel pack is to be installed as it ensures an approximately even annular space. If installed, gravel packed sections should be sealed off top and bottom with clay. It is normal practice nowadays to gravel pack nearly the total length of the borehole but seal off the weathered/topsoil zone at the top. The remaining annular space should be backfilled with an inert material, and the top five meters grouted with cement to ensure that no surface water at the wellhead can enter the well bore.

Well Development

Once the screen, gravel pack, seals and backfill have been installed, the well should be developed. Development has two broad aims:

- a) It repairs the damage done to the aquifer during the course of drilling by removing clays and other additives from the borehole walls, and

-
- b) It alters the physical characteristics of the aquifer around the screen and removes fine particles.

The project does not advocate the use of over pumping as a means of development since it only increases permeability in zones, which are already permeable. Instead, we would recommend the use of air or water jetting, which physically agitates the gravel pack and adjacent aquifer material. This is an extremely efficient method of developing and cleaning wells.

Well development is an expensive element in the completion of a well but it is usually justified in longer well life, greater efficiencies, lower operational and maintenance costs and a more constant yield.

Well Testing

After development and preliminary tests, a long-duration well test should be carried out.

Well tests have to be carried out on all newly completed wells, because not only does this give an indication of the success of the drilling, design and development, but it also yields information on aquifer parameters which are vital to hydro-geologists.

A well test consists of pumping a well from a measured start level (SWL) at a known or measured yield, and recording the rate and pattern by which the water level within the well changes. Once a dynamic water level is reached, the rate of inflow to the well equals to the rate of pumping. Towards the end of the test a water sample of at least two litres should be collected for chemical analysis.

The duration of the test should be 24 hours, with a further 24 hours for a recovery test (during which the rate of recovery to SWL is recorded). The results of the test will enable a hydro-geologist to calculate the best pumping rate, the pump installation depth, and the drawdown for a given discharge rate.

Well Maintenance

Once the well has been commissioned and a pump installed at the correct depth, the maintenance schedule should be established. Checks on discharge (m³/day), pumping water level (metres below a leveled and immovable bench mark), and static water level (if for any reason the well is not used for a 24-hour period) should be taken as part of a regular, routing process.

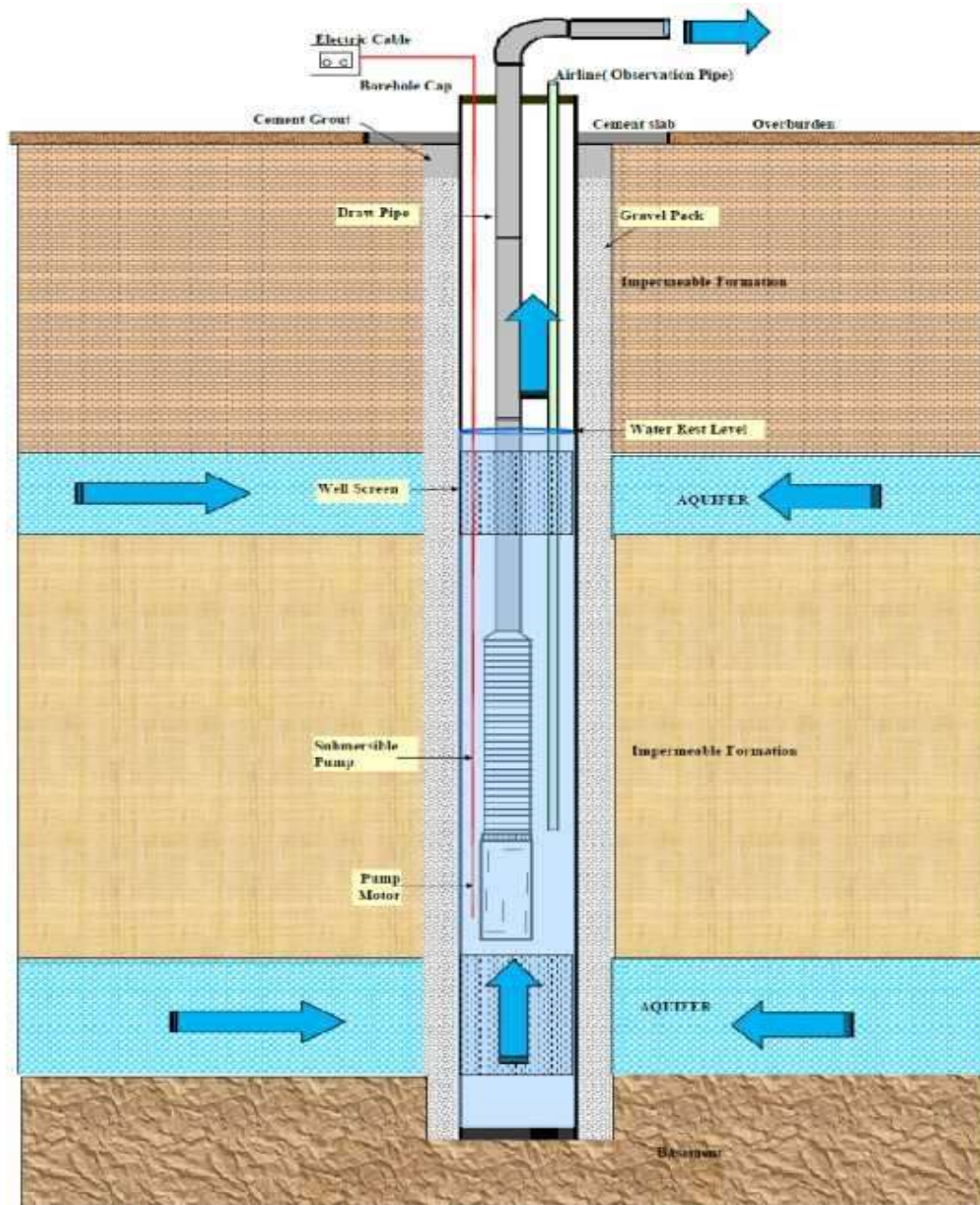


Figure 1: A schematic illustration of a completed borehole.

Figure 2: Schematic illustration of a complete borehole

2.2 Project cost

The summary of the certified Bills of Quantities (BOQ) that form the budget of the project is as shown below. The total project cost is Kshs.m 15,000,000. The implementation of the ESMMP is to be included into the BOQ and the ESMMP presented in the construction contract.

CHAPTER THREE: THE LOCATION OF THE PROJECT

3.0 Introduction

The proposed site is found in Quone village, Sericho Ward, Graba Tula Sub-county in Isiolo County in Kenya. Figure 2 presents the location of the proposed site on the Isiolo County map. Figure 3 presents the proposed project area. The proposed project site location is UTM 37N 538971mE; 108479mN, GPS 39.3502750E, 0.9814320N



Figure 3: Google earth map location of the proposed borehole site

3.1 Land Ownership

The land on which the borehole will be done is community land already set for the borehole. They signed the attendance list as consent and community resolution form to show the land being communal and has been donated the land for water pan investment (**Annex 1**). No one will have claim on the land after the investment.

3.2 Physical and Ecological Environment for the Site

3.2.1 Climate

Quone falls under zone IIA of the geologic formation. This zone comprises of Basement System Area of limestone type (Refer Map 1-4) Four main seasons are identified in the County. These are the hot and dry season from mid-December; the long rains from the end of March to the end of May; the cool and dry season from June to September and the short rains from mid-October to mid-December.

Rainfall

The mean annual rainfall within Isiolo County ranges from 250 to 650mm. The project area falls under the arid climatic zone with a rainfall of between 300 – 350 mm. There are two wet seasons with the long rains falling between March and May and the short rains falling in November.

However, the Rainfall is erratic and unpredictable. The area records more than nine hours of sunshine per day and has a huge potential for harvesting and utilization of solar energy.

Temperature

High temperatures are recorded in the county throughout the year, with variations in some places due to differences in altitude. The mean annual temperature in the county is 29 degrees centigrade. The county records more than nine hours of sunshine per day and hence has a huge potential for harvesting and utilization of solar energy. The average annual evaporation rates ranges from 4.0 to 5.5 mm/day.

Soils

Soils are composed mainly of sandy soil but in parts of the location along the dry river beds there are black cotton soils. The sandy soil does not support crop production because water drains easily. Soil erosion is a menace and the top fertile layer of the area is easily washed away.

3.2.2 Geology and Ground water qualities

The Geology of Quone area can be found in Report No. 103 Geology of the Isiolo area dated 1989 by Ministry of Environment and Natural Resources, Mines and Geological Department.

Isiolo County is wholly underlain by the Precambrian Basement System. The Basement System rocks are predominantly outcropping in the furthest end of the western arm of the sub county and also in the areas to the west and south of the Merti Plateau. The South-west of the Sub-county (slopes of Mount Kenya and Nyambeni Hills) is mainly covered by the volcanic flows which spread from a multitude of parasitic cones of Mount Kenya and Nyambeni volcanic centres. The rest of the Sub-county is part of the Anza Basin and such is dominated by sedimentary rocks which are sporadically overlain by volcanic rocks as a result of either isolated fissures or lava flow from the Marsabit area.

The Basement System rocks include different types of gneisses and schists, crystalline limestones, quartzites, migmatites and grabulites, locally affected by different types of intrusions. The sedimentary rocks found in the Sub-county are sandstones, limestones, marls, shales, conglomerates, grits, sands, clays and gravels. The volcanic rocks include basalts and pyroclastic deposits. (Refer Map 1-3 below).

3.2.3 Physical Features

Attitude

Most of the land in the Isiolo County is flat low lying plain. The plains rise gradually from an altitude above sea level at Lorian swamp (Habaswein) 300M above sea level at Merti Plateau and 1100 M above the sea level at Isiolo town.

3.2.4 Hydrology and Drainage System

There are six perennial rivers in the county namely; Ewaso Ngiro North, Isiolo, Bisan-gurach, Bisanadi, Likiundu and Liliaba rivers. Ewaso Ngiro North River has its catchments area in the Aberdare ranges and Mount Kenya. It also serves as a boundary mark between Isiolo North and Isiolo South constituencies. Isiolo River originates from Mount Kenya and drains into Ewaso Ngiro River. Bisan- gurach and Bisanadi Rivers are found in the southern part of the county drains to River Tana. Likiundu and Liliaba originate from Nyambene hills and drains into Ewaso Ngiro North River (Sugg, 2007).

3.2.5 Hydrology

The county has a combination of metamorphic rocks and other superficial rock deposits. Tertiary rocks (Olive Basalt) are found in the northern parts of the county, where oil exploration has been going on. The areas covered with tertiary marine sediments have a high potential for ground water harvesting.

CHAPTER FOUR: PUBLIC PARTICIPATION & STAKEHOLDER CONSULTATIONS

4.1 Introduction

Members of the public are supposed to participate and get involved because the project being carried out will affect them. Reference is made to Section 17 of the Environmental (Impact Assessment and Audit) Regulations, 2003, which states that the proponent shall in consultation with the authority, seek the views of persons who may be affected by the project

The World Bank Group's Environmental Assessment Policy (OP 4.01, January 1999) requires that project-affected groups and local non-governmental organizations (NGOs) be consulted during the impact assessments process about the project's potential environmental and social impacts. The purpose of this consultation is to take local views into account in designing the environmental and social management plans as well as in sub project design. For complex sub projects where the environmental impacts and risks are high, the policy requires public consultation at least twice: first, shortly after Environmental Screening and before the terms of reference for the ESIA are finalized and secondly, once a draft ESIA Report is prepared. Consultation during sub project execution is also required. Section 5 summarizes the consultation programme for the ESIA's, and confirms that the sub project meets and indeed exceeds these requirements.

4.2 Objectives of public participation and stakeholders consultations

This public participation was conducted to assure the quality, comprehensiveness and effectiveness of the assessment and ensure that the public views are adequately taken into consideration in decision making process. Specifically the public participation and stakeholder consultation aimed at

Specifically the objectives are:

- ✓ To identify potential environmental impacts and their significance.
- ✓ To assess the relative importance of the impacts on plans, designs and site.
- ✓ To propose preventive mitigation and compensative measures for the significant negative impacts of the project on the environment.
- ✓ To generate baseline data for monitoring and evaluation of the effectiveness of mitigations during the project cycle.
- ✓ To present the results of the EIA that can guide informed decision making.
- ✓ To prepare ESM&MP for the proposed project.

4.3 Methodology for public participation

This public participation was done through a meeting with the community and members of Quone borehole Management Committee at the site on Tuesday, December 2020 where 52 people including the ESIA/ EA experts attended (**Figure ...**). The information obtained from both field visits and public consultations formed the basis for incorporation of public views into this report. See **Annex II** for minutes of the public meeting and **Annex III** for participants list of names.

The agenda for the meeting were

- a) Welcome and introductory remarks-chairman , chief and local leaders
- b) Discussion positive and negative impacts and their mitigation measures –lead expert
- c) Way forward
- d) Any other business (AOB) and adjournment

4.4 Methodology for stakeholder consultation

In this stakeholder consultation, questionnaires were administered randomly to the immediate neighbors of the facility. To avoid bias, the respondents were picked at random. 15 No. of people were consulted about the proposed borehole project. The issues that were raised during the public participation were captured on the questionnaires annexed on this document as .The table below summarizes the issues that arose during the public consultation proc

4.5. Sources of Information

During the environmental impact assessment, public participation was a key component in getting information to be incorporated in writing this report. Positive and negative views of the perceived affected neighbors were sought. The exercise was conducted by a team of registered environmental experts through administration of pre-designed questionnaires, and interviews in various areas surrounding the proposed project site

The neighboring communities were asked to comment and give views concerning the proposed project on various issues concerning the following:

- ❖ The positive impacts that may emanate from the development of the proposed project
- ❖ Measures that the developer should put in place during and after the project to mitigate impacts
- ❖ Whether the proposed project construction and occupation will cause the negative impacts on the following:
 - a) Local residents
 - b) Natural ecology of the area
 - c) The human environment
 - d) Public health and safety
 - e) Effects on the soil
 - f) Effect on areas of scenic beauty
 - g) Effect on plant species composition
 - h) Effect on cultural heritage sites

Many respondents were consulted during public appraisal exercise although, some declined to give their contacts or real identification card numbers. However their views have been incorporated in this project.

The sub item below summarizes issues were raised and captured in the questionnaires from the community (respondents) towards the proposed borehole project and issues captured during the desktop studies analysis. The issues have been categorized as positive and negative issues (Selected Sampled filled questionnaires attached as appendix)

4.6 Issues raised by the surrounding community

4.6.1 Employment opportunities

The respondents consulted indicated that the project will create employment opportunities during the project cycle from construction to operation and the staff that will be involved in the daily cores within the project after its completion such as guards, sale of water, sale of food stuffs around the borehole unit

4.6.2 Availability of water for domestic use

Clean and quality tested water will be available for domestic use. Water will be available for livestock and pasture development where appropriate

4.6.3 Improved Economic status

Income at household level will be enhanced because communities will be able to food stuffs around the borehole to pastoralists who have come to water livestock from far areas. Poverty incidences will be reduced and food security status of the community members will be enhanced

4.6.4 Enhanced livelihood resilience and alternatives

The respondents noted the youth and women will be involved small stock production .Along the value chain there will be marketing hence strengthening the resilience of the beneficiaries within and around the project area

4.6.5 Increased wildlife and livestock conflicts

Some of the respondents felt that the proposed project would bring a problem of wildlife (herbivores particularly wild ungulates that are within the area) and livestock conflict due to inadequate water in the dry season. They however advocated that the community should explore possibility of identifying sites outside the locality for wildlife to water and avoid sharing of water with wild animals

4.6.6 Accidents during construction

There is likelihood that during the construction phase of the proposed project, construction workers may get involved in accidents as a result of falling building stones/bricks, sharp metals and machines used in the construction. The proponent will strictly adhere to safe working practices to protect the workers, neighbors and passers-by

4.6.7 Improved local socio-economy

During public participation, neighbors anticipated that the proposed development will contribute to improved household incomes, water availability and the county Government

4.6.8 Noise pollution

There was concern over the possibility of high noise and vibration levels in the project site as a result of excavation and construction works. The sources of noise pollution will include transport vehicles, construction machinery and metal grilling and cutting equipment. However the proponent will take appropriate steps to minimize noise impacts including provision of appropriate protective equipment to construction workers, planning and minimizing the frequency of materials transport, ensuring that all equipment are well maintained

4.6.9. Child labour

The participants raised concern on the possibility of child labour during operation of the borehole. Children will be watering livestock at designated watering points around the borehole area. It was agreed that sensitization and awareness creation be done to discourage child labour.

4.6.10 Anticipated Cases of COVID-19

There was concern on the possibility of increased COVID 19 virus incidences due to anticipated crowding of community members around the proposed borehole site and even during water after commissioning of the borehole. The participants were informed that the drilling site will be fenced off and operational activities will be done outside the water extraction site.



County Environment and Social Safeguards officer inspecting the site proposed by the hydrogeologist

CHAPTER FIVE: ANTICIPATED ENVIRONMENTAL, SOCIAL IMPACTS AND MITIGATION MEASURES

5.1 Introduction

Currently, there are minimal infringements by the area residents on the project site that may not require relocation of people or activities. In addition, there will be no shifting of utilities such as water supply pipelines, sewers and electrical lines due to the proposed project since these do not pass through the proposed site.

5.2 Activities and anticipated environmental and social impacts during the pre-construction/preparatory phase

The pre-construction phase includes creating a strategic plan for the project; creating a design; securing permits, licenses or entitlements; and mobilizing resources required for borehole drilling and development. These activities also include mobilizing the drilling team which may not have significant social and environmental issues

5.3 Activities and processes during the borehole drilling and development phase

This will involve placing on site the drilling, support truck and accessories, casing /piping supply trucks among others. The key activities and processes shall be

- a) Locating the drilling point in reference to hydro-geology survey report and positioning the drilling rig
- b) Preparing the drilling foam
- c) Positioning of casing and pipes truck adjacent to the drilling rig to reduce lifting and moving the casings by manual labor
- d) The actual drilling and placement of casings and submersible pump
- e) Test pumping
- f) Installation of solar panels and control systems
- g) Developing the borehole –apron and finishes
- h) Installation of water tank and accessories
- i) Handing over the borehole to community

5.4 Anticipated environmental impacts during borehole drilling and construction

During the borehole construction phase, the operations and processes are likely to result into significant impacts. The impacts from these activities among others are discussed here below:

5.4.1 Soil compaction

Assessment

As machines and people move on ground the soil is compacted. Compaction has the undesired effect of hindering air and water penetration beneath the soil surface and thus limiting aerobic activities of soil dwelling organisms. This may have negative consequences on soil productivity on a localized scale. Compaction also enhances run-off during the rainy season resulting into soil erosion.

Mitigation

- a) Strictly control construction vehicles to ensure that they operate judiciously and over designated areas to reduce soil compaction.
- b) Rip off any compacted areas after construction to allow aeration of soil and ease infiltration of water into the soil.

5.4.2 Groundwater pollution

Water, especially for domestic use should be of high quality and wholesome. Poor water quality could be of great concern to human and animal health. The water that seeps into the ground may be contaminated to some degree and eventually affects the quality of the groundwater and indeed, borehole water. Percolation of water from sanitary systems i.e. toilets and refuse disposal sites poses a serious threat to the preservation of groundwater quality.

Protection of groundwater quality depends on the well design and the methods and materials used to construct the well. Some of the deficiencies in well construction are: -

- a) Insufficient or substandard well casing
- b) Inadequate seal between the well casing and the borehole
- c) Poor welding of casing joints
- d) Lack of sanitary protection at wellhead.
- e) Use of well pits.

Causes of Pollution of Groundwater

Groundwater can be polluted by poisonous or pathogenic substances or by other detrimental changes in its quality especially through:-

- a) Poisonous substances such as compounds of lead, cadmium, chromium cyanide, fluoride or mercury.
- b) Chemicals for plant protection, herbicides, pesticides and plant growth regulators.
- c) Sewerage, refuse or garbage
- d) Detergents, fats, petroleum products
- e) Coloring agents such as dyes, paints and aromatic substances
- f) Metabolic and decomposition products of microorganisms and fertilizers Acids, alkalis and salts.

Sources of Danger

A borehole should certainly be located as far away as possible from all the sources of dangers such as: -

- a) Transportation, utilization, storage and deposition of garbage, refuse or scrap metals.
- b) Sewage seepage into the ground through septic tanks, injection of sewerage or other dissolved and undissolved substances into the ground surface water.
- c) Pipelines for substances which can impair the quality of water
- d) Polluted water bodies
- e) Parking and washing of motor vehicles
- f) Washing and leachates from the soil, organic fertilizers (liquid manure, barnyard manure, sludge, garbage compost) and mineral fertilizers.
- g) Use of chemical substances of plant protection, herbicides, pesticides and growth regulators.

Mitigation measures

- a) Groundwater quality must be safeguarded by a correct territorial planning and protection of surface waters since these are strictly linked to ground water resources.
- b) Ensure that all potential sources of pollution are eliminated for example by ensuring that the sewage disposal system are well protected and does not leak even during exhaustion
- c) The proponent will adhere to the regulations set by the Water Resources Authority on the amounts to be extracted from a borehole and the number of pumping hours. This helps to reduce wastage and misuse of this resource.
- d) Use water based drilling fluid
- e) Case the well as it passes through the water table
- f) Proper housekeeping within and around the rig will be observed before, during and after drilling, while proper clean up procedures will be undertaken in case of drilling fluid and oil spills.

5.4.3 Groundwater depletion

Assessment

This may result from excessive abstraction of the water from the borehole i.e. beyond the permitted limit.

Mitigation measures

On completion of the drilling and other related works;

- a) The borehole should be installed with a Master Meter and an Airline/Piezometer to monitor ground water abstraction and to facilitate regular measurements of the static water level in the borehole, respectively
- b) The maximum ground water abstraction permitted from the borehole is limited to the authorized volume per day for the domestic/industrial use only subject to availability from 60% of the tested yield for a maximum abstraction period not exceeding ten (10) hours per day
- c) Install auto-shut water taps to reduce water wastage

5.4.4 Noise and vibrations

Assessment

The significance of noise impacts depends on whether the project would increase noise levels above the existing ambient levels by introducing new sources of noise. Noise and vibration impacts would be considered significant if the project would result in: a substantial permanent increase in ambient noise levels of more than 90 dBA (can be transmitted to over 30 metres away) in the project vicinity; exposure of persons to or generation of excessive ground-borne vibration or noise levels and a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. The effects of noise include:

- a) Noise interferes with communication and can lead to tinnitus (ringing in the ears);
- b) Nuisance;
- c) Fatigue and tiredness, reduced efficiency, low morale and severe and permanent loss of hearing which may persist for several hours due to prolonged exposure to noise;
- d) Deterioration of the environment within the project site and the surrounding areas through vibrations produced by heavy construction machinery;
- e) Weakening of adjacent buildings resulting into cracking of their walls by vibrations.

Mitigation

Adhere to the Kenya Noise Prevention and Control rule passed in 1996 under legal notice No. 296 as a subsidiary legislation to the Occupational Health and Safety Act (OSHA) of 2007 which requires putting in place measures that will mitigate noise pollution. Consider especially the rule which states that, “No worker shall be exposed to noise level in excess of the continuous equivalent of 90 dBA for more than 8 hours within any 24 hours duration”.

- a) Minimize noise at the site and in the surrounding areas through:
 - i. Properly servicing and maintaining and tuning drilling machinery such as generators and other heavy duty equipment to reduce noise generation; and
 - ii. Placing noisy equipment in sound proof rooms or in enclosures to minimize ambient noise levels.
- b) Minimize the impacts of temporary drilling noise and vibration by:

Planning the drilling work to take place only during the day when the neighbors are also at work.

- i. Maintaining reasonable working hours so as to reduce the number of complaints concerning noise from the workers and neighbors.
- ii. Operating shorter shift periods for workers who come in direct contact with high concentrations of noise or other hazards.
- iii. Posting notices at the construction site informing the public of the construction activities, time and day.

-
- iv. Providing ear protective devices to prevent high frequency noise emitted by the high frequency machines during construction phase.

5.4.5 Hazardous wastes

Assessment

Accidental oil and diesel spills would be caused by leaking of drums holding the diesel and oil that are stored on the site. The machines being used at the site could also cause oil spill especially if they are not well maintained or during regular maintenance. However, the occurrence of these wastes is expected to be minimal. Seepage of hydrocarbon products such as oils, grease and fuel if not carefully handled will result into contamination of water thus rendering it not go for both domestic and animal use. During the dry season spilled fuel, oils and lubricants could result into fire risks.

Mitigation

The following mitigation measures should be adopted to limit the impact of hazardous substances on-site;

- i. Ensure that the drilling crew is aware of the procedures to be followed for dealing with spills and leaks;
- ii. Ensure that spills are immediately removed along with all contaminated material and disposed of at an approved hazardous landfill site;
- iii. Ensure that all contaminated material is stored in a banded area before being disposed of;
- iv. Ensure that a suitable spill kit is available on site, to be applied to all contaminated areas that will absorb/breakdown the spills. The quantity of such materials shall be able to handle the total volume of the hydrocarbon stored on site; and
- v. Ensure that all diesel and oil drums are stored in a banded area with the respective tags like “Danger” or its pictorial representation.
- vi. Caution to be observed when transporting diesel and oil to, from and within the site. It is recommended that if possible, this be done using qualified oil transporters
- vii. Repairing and maintenance and greasing of vehicles and construction plants must be carried out off the site (petrol station or garage) to avoid fuels and lubricants spills at the project site and contamination of the water

5.4.6 Air Quality

Assessment

The drilling process is expected to cause a lot of dust emissions due to vehicles and trucks driving to and from the site along the rough road leading to the site. Limited dust would be generated by the actual drilling activities. Stock piles arising from the drilled area could also cause dust emissions if blown away by wind. Smoke will be generated from the vehicles and the drilling equipment. The magnitude will however depend on the condition of the machines and the vehicles during the drilling period.

Mitigation

The following mitigation measures can be adopted to reduce degradation of the air quality by the drilling activities.

- i. Provide dust masks to people visiting the site and have extra ones for site visitors
- ii. Stockpiles of the earth should be watered if dry to minimize dust from blowing

-
- iii. All fuel powered equipment including the generator will be serviced and maintained in optimal working conditions to mitigate against exhaust emissions.
 - iv. Workers and any other people at the site should wear face masks at all times to avoid carbon monoxide poisoning

5.4.6 Geological risks

Assessment

The ubiquitous drilling and digging of the ground soil for water, weakens the soil surface with an enhanced porosity as its ultimate result. With such vulnerability and lesser soil cohesion, the ephemeral soil might trigger erosion in the underground. Due to this, boreholes have may cause negative environmental effects on ground water with high tendency of land subsidence (collapse) which may affect structures and infrastructure. Boreholes could lead to potential landmines, earthquakes or tremor.

Mitigation

The following mitigation options should be adopted;

- i. The proponent will be advised to carry out a hydro-geologist survey to determine the suitability of the area for the drilling of a borehole
- ii. Temporary casings may also be installed during drilling in case they notice the soil strata is weak to prevent the borehole walls from collapsing which should be replaced by stronger casings
- iii. Drilling be done in the presence and supervision of a hydro-geologist

5.4.7 Solid Wastes

Assessment

The major solid waste will be the drilled cuttings. There will be some solid containers such as cement, bentonite and gravel bags and other packets with materials and equipment to be used during implementation of the project. Other solid waste will be generated from the composite housing of the drilling crew. At the time of assessment the church had not secured a solid waste collection point.

Mitigation

The following mitigation options can be adopted;

- i. Any remaining waste (paper or polythene containers, cement, bentonine and gravel bags, excavation debris, remaining gravel pack etc. should be burned and/or disposed in sanitary dumpsite before the project is commissioned.
- ii. Some of the drilled materials will be used in the borehole construction by back-filling the annular space. All excavated material from the draining channel will be used to refill it.
- iii. Drilling crew to be encouraged to dump their personal wastes in designated covered dustbins
- iv. Do not secure a solid waste disposal site within a radius of 50M of the proposed borehole site.

5.5 Transition phase from construction to operation

During the transition phase from the completion of the development to the start of operations, the following will be done:

- Remove any wastes from the site;
- Rehabilitate any areas adversely affected by the construction through spillages of pollutants: liquids, chemicals, cement and paint among others at the site and any other areas disturbed as a result of the construction outside the site.

-
- Plant grasses and ornamental trees at the site.
 - Put up fencing around the site for protection from intruders and unauthorized persons and ensure privacy.

5.5.1 Social Economic impacts during drilling and operation phase

Implementation of the proposed borehole project will ease the water problems in the targeted community. This is because the consumers will have enough water that will be used for livestock and domestic use after the implementation of the project, there will be no vacation of people, any rerouting of any infrastructure such as road, underground power, telephone or water supply lines or relocation or closing down of social of social amenities. All activities related to the project will be carried out within a land agreed upon between the proponent and the community members. The project will thus improve social-economic aspects of the potential consumers.

5.5.2 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) The contractor will develop and implement a Children Protection Strategy that will ensure minors are protected against negative impacts associated with the project.
- b) All staff must sign, committing themselves towards protecting children, a contract which clearly defines what is and is not acceptable behavior.
- c) Children under the age of 18 years will not be hired on site as provided by Child Rights Act (Amendment Bill) 2014.
- d) 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.
- e) 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.

5.5.3 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.

5.5.4 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.

5.5.5 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.
 - iv) Management and Coordination: including integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.

5.5.6 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.

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

During project execution (civil works), large numbers of workers will be required to assemble together in meetings, toolbox talks and even at work sites; varied number of workforce including suppliers of material and services are also expected to come in from various places in the country which may be COVID-19 hot spots; and interaction of workers with the project host community will happen as workers find accommodation close to work sites, and/or return to their homes after works. 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.

5.6 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 MANAGEMENT AND MONITORING PLAN

(EMP)

Environmental Management Plan (EMP) for developing projects is usually to provide a logical framework within which identified negative environmental impacts can be mitigated and monitored. In addition the EMP assigns responsibilities of actions to various actors and provides timeframe within which mitigation measures and monitoring can be done. The EMP is vital output of an Environmental Impact Assessment as it provides a checklist for project monitoring and evaluation.

EMP outlined below will address the identified potential negative impacts and mitigation measures to the proposed project based on chapters of Environmental Impacts and Mitigation Measures of the Negative Impacts

6.1 Design and Construction Phase

The necessary objectives activities, mitigation measures and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with construction phase of the proposed borehole are outlined below:

6.2 Environmental Management Plan: During Preliminary and Construction Phase

Table 1 Environmental Management Plan for Design and Construction Phase

Environmental Management and Monitoring Plan: Design & Construction Phase						
Activity	Potential Negative Impacts	Mitigation Measures	Responsibility	Frequency/Timing	Cost	Verifiable Indicators
Project Design Phase						
Planning, Surveying, EIA Study	Trampling on vegetation, lack of consensus towards the project between stakeholders	Avoid unnecessary vegetation destruction Intensify consultation	COUNTY GOVERNMENT OF ISIOLO and the design/EIA team	Throughout the project design stage, throughout the project cycle	As provided in the contract	Vegetation destroyed, project acceptability
Site Preparation Phase						
Clearing (Bushes)	Loss of biodiversity, Soil erosion	Selective and careful removal of vegetation. Have minimal interference with vegetation	Contractor	Throughout construction period	As per the project cost	Incidences of haphazard vegetation clearing lack of backfilling in excavated areas
Transportation of materials	Noise, trampling of vegetation	Maintain modicum of silence, use designated tracks avoid using noise prone vehicles such as old tractors, tighten machine parts	Contractor /Construction supervising Engineer	Construction period	Included in BoQs	Number of vegetation destroyed, increase in people stress
Excavation and trenching works	Soil erosion and solid waste	Backfilling of excavated areas, solid waste put in bins are transported outside the project area	Contractor	Construction period	As per project budget	Evidence of exposed soil, and solid waste in the project area
Drilling	Geological Risks	Carry out a hydro-geological Temporary casings may also be installed during drilling in case they notice the soil strata is weak to prevent the borehole walls from collapsing which should be replaced by stronger	Contractor	Construction period	As per project budget	Hydrogeological survey reports

		casings				
Accidents	Injuries due to cuts or falling snake bites,	Adherence to safety requirements and standard awareness creation on possible accidents, training of technicians installing warning signs	Resident engineer/Contractor	Throughout the project cycle	As per project budget	Number of accidents/incidences recorded, number of technicians trained number of warning signs installed and their intervals
Social Management and Monitoring Plan: Design & Construction Phase						
	Occupational Health and Safety (OHS)	Install Warning signs Provide PPE such as goggles, gloves, hard hats, overalls, earmuffs, among others . Providing firefighting equipment and in easily accessible areas Awareness creation	Resident engineer/Contractor	Construction period	As per project budget	Number of accidents/incidences recorded,
	Child labor	Ensure that persons under the of 18 are not engaged or employed in undertaking the project activities	Contractor	Throughout the project cycle	10,000	Reports, bid documents; labour returns; mails with Childrens' depart
	Gender-based violence at community level	Implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including	Contractor	Throughout the project cycle	5,0000	Log register; GBV Action plan; GBV reports;
	SEA of community by project workers	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	Contractor/dept of social services	Throughout the project cycle	10,000	vNo of grievances registered on sexual exploitation.

		procedures at the project level, including confidential data management;				
	COVID-19 amongst workers	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	Contractor/dept of social services	Throughout the project cycle		No of covid positive cases reported No of workers sensitized
	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.	Contractor/dept of social services	Throughout the project cycle		Number of cases of diseases reported

6.3 Operational Phase ESMMP

Table 2: Environmental and Social Management Plan for the Implementation and Operation phase

Impact	Action Required/Mitigation Measure	Responsibility	Time frame	Cost	Verifiable indicators
Ground depletion or reduced	Abstraction water equivalent borehole yield based on pumping test	Borehole management committee	Continuous	Routine Work	Pump test results
Aquifer compaction and Subsidence	Abstraction water equivalent to aquifer yield based on recovery test especially during the dry season to avoid depletion of ground water, possible compaction of aquifer and land subsidence	management committee/County dept of water	Continuous	Routine work	Aquifer yield tests
Ground water contamination	Protect the borehole from surface contaminants by: Using potable drilling water, biodegradable drilling foam, non-corrosive casings and screens, putting end plugs to dipper lines, constructing slab around boreholes at the ground surface, raising casing above ground surface, diverting surface run off from making pools around the borehole	Borehole management committee County Dept of water	Continuous	Incorporated in project cost	Water Test Results
Solid waste generation	<ul style="list-style-type: none"> • Routine water quality surveillance • Installation of perimeter fence around the steel water tank • Construction of pit latrines 	Borehole management committee County Dept of water/ environment	Semi annually 1 month 3 months	20,000 200,000 800,000	-Water Test Results -Visual Observation of the fence -Visual observation of both the bathroom and the pit latrine
Fugitive dust, Exhaust fumes Air pollution	Appropriate scheduling of activities. Construction monitoring. Dust suppression through sprinkling if any. Proper servicing of equipment to reduce exhaust fumes. Communication with residents. Provision of dust protective screens	Borehole management committee County Dept of environment	1 month	Routine work	Service Register

Loss of vegetation, habitat, degradation & loss of income	Rehabilitation through planting of grass trees along pipeline and around water points and general environment greening to restore flora and fauna and habitat	Borehole management committee	2 months 3 months	100,000 15,000	Visual observation of trees nurseries and trees
Control of operator borehole and steel water tank user injuries	<ul style="list-style-type: none"> • Training and advocacy on borehole and other water resources management • Installation of the safety signs • Training of the borehole and steel water tank users on safety 	Borehole management committee County Dept of water/ environment	<ul style="list-style-type: none"> • 3 months • 1 month • 2-4 times/year 	40,000 20,000 100,000	-Training records interviews -Visual observation of the safety signs -Training records
Structural stability and maintenance	Repair and maintenance of borehole water tank structures	Borehole management committee	Seasonally	50,000	Quarterly inspection report
Soil erosion	Plant grass and adaptable indigenous tree species and fencing off the project area	Borehole management committee/County Dept of environment	3 months	20,000	Training and sensitization
Oil and fuel spill	.. Equipment maintenance on site will be minimal and monitored. In an event of oil/fuel spill , the affected soils will be scooped and disposed away from water course and terrestrial and aquatic life	Borehole management committee(BMC)	1 month	Routine work	Record reports on Oil and fuel spills
Theft vandalism of pipes by farm owners	Construct water kiosks at close proximity to community for them to own the project. Promote community policing	Borehole management committee(BMC)	Project period	Incorporated project cost	Reports on vandalism and theft incidences
Social Management and Monitoring Plan: Operation Phase					
Occupational Health and Safety (OHS)	Install Warning signs Provide PPE such as goggles, gloves, hard hats, overalls, earmuffs, among others . Providing firefighting equipment and in easily accessible areas <ul style="list-style-type: none"> • Provide a list of contract person and ambulance to be contacted during accidents Awareness creation Provide a well-stocked onsite first aid box	Borehole management committee(BMC)	Throughout project phase	As per project budget	Register of accidents Number of PPEs supplied and used Number of effective fire extinguishers

Child labor	Ensure that persons under the age of 18 are not engaged or employed in undertaking the project activities	(BMC)/County dept of Social service	Throughout the project cycle	10,000	Records of incidences of child labour
Gender-based violence at community level	Implement provisions that ensure that gender-based violence at the community level is not triggered during operation phase	(BMC)/County dept of Social service	Throughout the project cycle	5,000	Register on GBV
SEA of community by project workers	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;	(BMC)/County dept of Social service	Throughout the project cycle	10,000	Recorded incidences and responses
COVID-19 amongst workers	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	Borehole management committee /dept of social services	Throughout the project cycle	100,000	Reported cases of COVID-19 Reports on awareness creation trainings
HIV/AIDs and other STIs	Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and sexual health and, awareness campaigns, multimedia and workshops or during Barazas.	Borehole management committee /dept of social services	Throughout the project cycle		Number of cases reported

The necessary objectives, activities, mitigation measures and allocation of responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with operational phase of the proposed borehole is outlined in Table 4

6.4 Decommissioning phase

In addition to the mitigation measures provided in two above tables in this chapter, it is necessary to outline some basic mitigation measures that will be required to be undertaken once all operational activities of the proposed project have ceased. The necessary objectives, mitigation measures allocation of responsibilities, time frame pertaining to prevention, minimization and monitoring of all potential impacts associated with the decommissioning and closure phase of the proposed project are outlined in Table

Table 3: EMP for decommissioning phase of proposed project

Expected Negative Impacts	Recommended Mitigation Measures	Responsible party	Time frame	Costs(Kshs)
Waste due to Project abandonment	<ul style="list-style-type: none"> i. Demolition and disposal of structures ii. Landscape restoration, Filling depressions, removing unused equipment, structures and facilities to give room for new activities 	Proponent/ community	1 year	Community contribution (in Kind)
Health and Safety Risks	<p>Implement all necessary measures to ensure health and safety and the general public during winding phase of the project as stipulated in Factories and Other Places of Work Act 514</p> <p>All health risks equipments must be cleared from the project site</p>	Proponent/community	Continuous	Community contribution (in Kind) in collaboration with proponent
Safety and security of the premises and surrounding areas	Ensure the general safety and security at all times by providing day and night security guards	Proponent/ community	Continuous	Community contribution (in Kind)

CHAPTER SEVEN: CONCLUSIONS AND RECOMMENDATIONS

From environmental point of view, the project poses minimal negative impacts especially due to its size and location except for the normal impacts usually associated with any excavation works. The negative impacts were found to be of low magnitude and can be easily mitigated at minimal costs. On the other hand, the positive impacts of the project are mainly socio-economic and would contribute immensely towards addressing resilience building and achievement of Kenya government Big FOUR agenda and Vision 2030 objectives of wealth creation, income generation and poverty reduction within the respective rural communities.

7.1 Conclusion

The importance of the proposed project to national development and the local community cannot be overemphasized. In addition to the following laid down guidelines, project design has also considered sound environmental management practices during its implementation. Having considered all the information collected, collated and analyzed during the study, it is the experts considered opinion that:

- The project does not pose any serious environmental concern, other than those of minor scale that accompany most development activities
- The positive environmental impacts outweighs the negative ones, which can be contained by following the prescribed Environmental Management Plan
- The proposed project will contribute to improve on the livelihoods of the pastoral community
- The project should be allowed to commence and activities being managed within the provisions outlined in the EMP
- The proposed project is a viable venture that should be given due support, Considering the fact that there will be minimal negative impacts to the environment and its potential to contribute to the rise in socio-economic status of the residents and thus improving food security which is the main strategic and corporate objective of the Isiolo County government
- The proponent has taken the necessary steps to adhere to the appropriate laws and procedures that govern implementation of projects in the country by commissioning the SPR and embracing public participation

7.2 Recommendations

- The proposed borehole project will lead to improved water accessibility and food security at community level, the few negative impacts identified have been adequately mitigated through diverse measures proposed in the EMP and thus we recommend that the project be considered for an EIA clearance and subsequent implementation
- The potential negative impacts of the project are low, easy to mitigate and the benefits to the community are very significant. If the proponent and beneficiaries undertake the necessary measures to mitigate the negative impacts as identified and recommended in the EMP, then there should be no reason to prevent the project from proceeding on as planned.

Given that the potential impacts are not significant to warrant any environmental degradation, this Environmental Impact Assessment presents a findings of low significance impacts that can be effectively mitigated.

It is therefore recommended that the proposed integrated pasture development project be approved by NEMA and allowed to proceed on strict condition that the impact mitigation measures under the Environmental Management Plan (EMP) are implemented as recommended.

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9.0 ANNEXES

9.1 ANNEX 1: CONSENT OF LAND OWNERSHIP AND USE



ISIOLO COUNTY GOVERNMENT

To: Chief Officer Lands

County Government of Isiolo

RE: LETTER OF NO OBJECTION BY QUONE COMMUNITY

Following the public participation and consultation meetings done by the county Government of Isiolo with the community and other stakeholders on 19th October 2019, they agreed that they will donate community land for development of a borehole. They agreed to set aside 1 acre of land for the drilling of Quone community borehole.

The management committee of Nine (11) people was established to fore see the project implementation.

1. Ward Administrator.....
2. Chief HUSSEIN SIMR Shie
3. Committee Members
 - (i) Buke Mohamed [Signature]
 - (ii) Raxulay Turo [Signature]
 - (iii) Jibrile Adhis [Signature]
 - (iv) Ibrahim Adan [Signature]
 - (v) Adris Ibrahim [Signature]
 - (vi) Abalihan Cayo [Signature]
 - (vii) Bate Gordan [Signature]
 - (viii) Adan Mohamed [Signature]
 - (ix) Warro Hassan [Signature]
 - (x) HAKIM Mohamed [Signature]
 - (xi) Musa Dila [Signature]

9.2 ANNEX 1I: MINUTES OF THE COMMUNITY CONSULTATION MEETINGS

MINUTES OF THE COMMUNITY BARAZA/MEETING ON PROPOSED BOREHOLE CONSTRUCTION IN QUONE , GARBA TULA SUB COUNTY, ISIOLO COUNTY HELD ON 10th June , 2021 AT QUONE VILLAGE AT 10.00 AM

Members Present:

List attached

Agenda

Project Brief

Community Sensitization on EIA

Public participation

AOB

Min 1./10/6/2021: Introduction

The meeting started at 8.00 a.m. with a word of prayer from Hussein Molole Boru 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 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 2./ 10/6/2021: Community Consultation/Sensitization on EIA

The EIA 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 EIA; 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 maintainance 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 Wajir 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 EIA 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;

1. Employment creation
2. Clean water
3. More time to spend on other activities and reduce time to fetch for water
4. Provide water for livestock
5. There will be reduced incidences of livestock losses due to starvation
6. 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 EIA 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 EIA 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 at 2.30 pm.

9.3 ANNEX III LIST OF PARTICIPANTS



Kenya Climate Smart Agriculture Project
(KCSAP)
Office of the County Coordinating unit





LIST OF ATTENDANCE

Activity

Public Participation - Drove Berekhe

Date: 11/6/2021

S/No	NAME	ID NO	GENDER	CONTACT Telephone: Email:	SIGN
1.	Boru Jaiso Wako	3335630	Male	0729774883	<i>[Signature]</i>
2.	CHUKULISA MOHAMED	29362995	F	0724161134	<i>[Signature]</i>
3.	MOHAMMED JIRAMTO	3281138	M	0706768135	<i>[Signature]</i>
4.	TIYO MOHAMMED	26610761	F	0724161266	<i>[Signature]</i>
5.	BADR ABGUDO GALGALO	0385301	M	0795728934	<i>[Signature]</i>
6.	JAMILA DIBA GALGALO	26306963	F	0701761208	<i>[Signature]</i>
7.	SIABA GODANNA SHEA	25136180	F	09237228312	<i>[Signature]</i>
8.	RAHIMA KOSAR BALASTO	30844360	F	0745801249	<i>[Signature]</i>

S/NO.	NAME	ID/NO.	GENDER	CONTACT EMAIL/PHONE	SIGNATURE
9.	FATIHA BILAL WAWO	0366864	F	0707048600	
10.	MuHAMMED DINA	21655796	Male	0764784928	
11.	ASNA ADAN	34990225	F	0759666905	
12.	YUSSUF SASURE	28482363	Male	0704964028	
13.	ADEYI MOHAMMAD	8490896	Female	0723564144	
14.	Abdirasheed Mohamed 023	25777020	Male	015102896	
15.	MuHAMMED DINA	2512635	Male	0703569343	
16.	SHUKRI ALI HUSSEIN	25129601	female	0707491946	
17.	IBRAHIM BIBA	03244106	Male	0705397844	
18.	NURIA KISHO IDO	0364919	F	0723493630	
19.	ALISHA ALI SAMRA	33186996	F	0745089693	
20.	HANUO NUBA 'DUTAWI	036454	F	0729965461	
21.	ALI ISLAM GUDO	4583267	M	0710964022	
22.	SADIA ABDI SAMI	29363024	F	071366104	

S/NO.	NAME	ID/NO.	GENDER	CONTACT EMAIL/PHONE	SIGNATURE
9.	SARA MOHAMMUD SAMRA	23043077	F	070440192	
10.	ALI RABA GORSHQ	11274846	M	072095520	
11.	RAJIA KADUBO	35360879	F	0702905863	
12.	ABSI KULOYE	23122190	M	0702304299	
13.	IBRAHIM MOJIDOMAN	37610147	M	0757846567	
14.	MUJIBAL HAPPI	35524769	M	07062841314	
15.	KOSAR ABDI OREGOLA	34968722	M	0718543723	
16.	KAMILA ABDULLAH	35058309	F	0793674287	
17.	MUSSEIN HUKA HARBO	35156501	M	0799606225	
18.	MADINA HASSAN	2017020	F	0705398101	
19.	ABDI IBRAHIM	33186906	M	0729977389	
20.	AMIN GALEMBO GRAMA	23984809	M	0701477574	
21.	NASTIM ABDI	39894420	F	0704270716	
22.	ROKIA MOHAMMUD GADAMA	2936808	F	0701233361	

9.3 ANNEX IV: SCREENING CHECKLIST

Koro

KCSAP ISIOLO COUNTY -ESS SCREENING CHECKLIST

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 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 type="checkbox"/>
Experience effluent and/or emissions discharge?	<input type="checkbox"/>	<input type="checkbox"/>
Export produce? Involve annual inspections of the producers and unannounced inspections?	<input type="checkbox"/>	<input type="checkbox"/>
Require scheduled chemical applications?	<input type="checkbox"/>	<input 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

	Yes	No
Are there:		
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

	Yes	No
Will the sub-project:		
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

Recommendation by County Director of Environment (CDE)
 The Project scheduled to continue as
 Name of CDE Mungu Mwangi
 Signature: Mungu Mwangi Date 13/6/2024

Note:

Project category	Characteristics
A	Full and extensive ESIA needed- irreversible environmental impacts; impacts not easy to pick or isolate and mitigation cost expensive; ESMP design not easily done; Must have the EIA done and future annual EAs instituted
B	Site specific environmental impacts envisaged; mitigation measures easy to pick, not costly and ESMP design readily done; need an ESIA and future EAs.
C	Have minimal or occasionally NO adverse environmental impacts; exempted from further environmental processes save environmental audits

9.4 ANNEX IV: SAMPLE QUESTIONNAIRE FILLED BY RESPONDENT

9.5 ANNEX V: PHOTOS ON PUBLIC CONSULTATION



9.6 ANNEX VI: BORE HOLE DESIGN

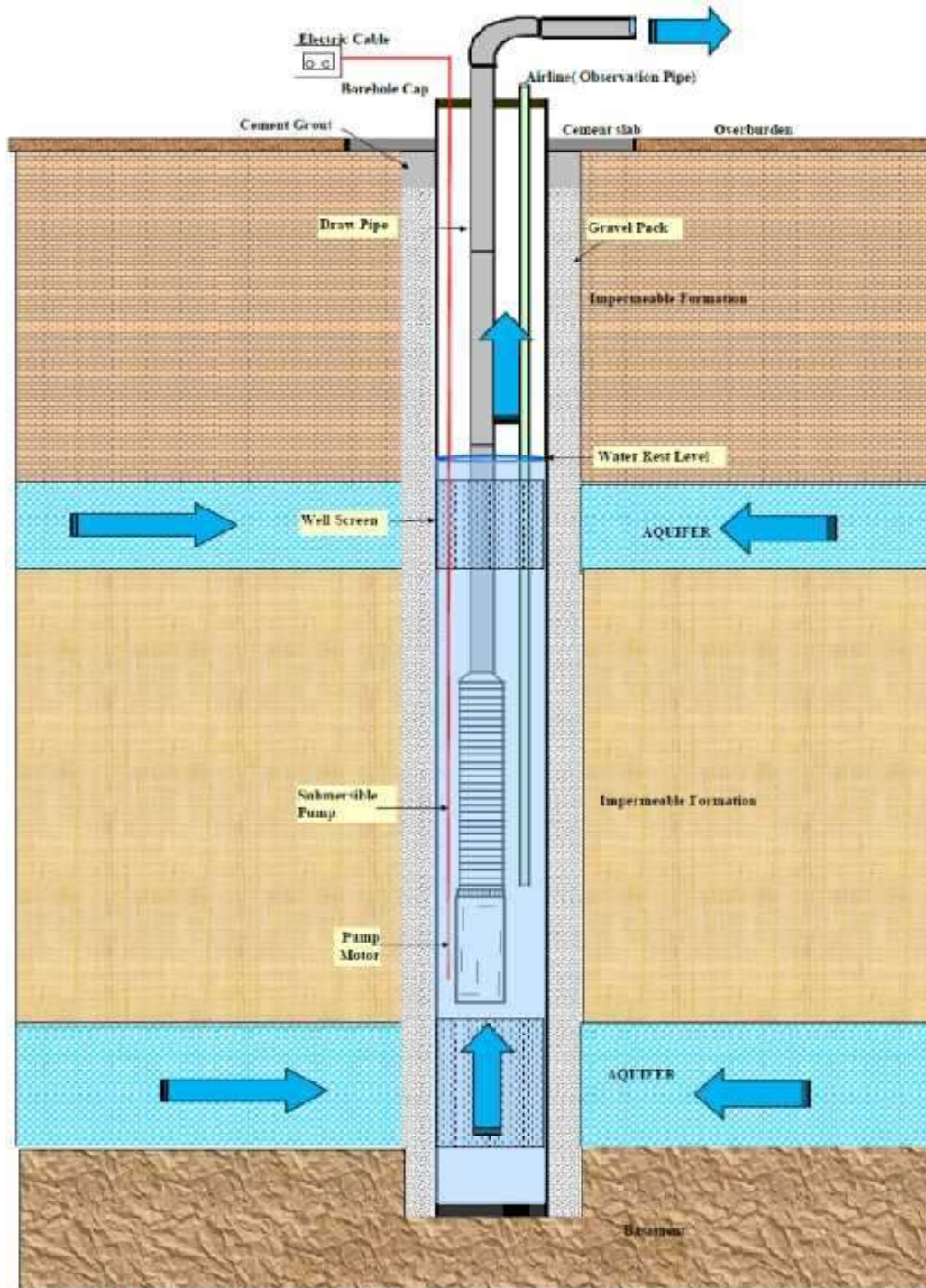


Figure 1: A schematic illustration of a completed borehole.

9.7 ANNEX VIII EIA CERTIFICATE AND PRACTISING LICENCE

FORM 7

(r.15(2))



**NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT
ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTISING LICENCE**

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**



