

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT
SUMMARY PROJECT REPORT
FOR
PROPOSED UP-GRADING AND REHABILITATION OF THIHA MICRO
IRRIGATION PROJECT ON TITLE NO. MUHITO/KARIARA/302 IN THUCI
AND MBUGWA VILLAGES, MUTUNDU SUB- LOCATION, RUTUNE
LOCATION, NYERI COUNTY

GPS Coordinates: 0°37'13"S 37°09'33"E



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MAY 2021

DECLARATION

I, the undersigned, submit this Summary Project Report for Proposed Up-grading and Rehabilitation of Thiha Micro Irrigation Project Located in Thuci & Mbugwa Villages, Mutundu Sub-Location, Rutune Location, Nyeri County. The Environmental Impact Assessment Comprehensive Project Report has been carried out in accordance with the Environmental Management and Coordination (Amendments) Acts (No. 5 of 2015& 2019) and Environmental (Impact Assessment and Audit) Regulations, 2003.

Charles Kirimi

Lead Expert (NEMA) Reg. No. 1622

Signed:_____

Signed on this 17th day of March 2021

PROPONENT

I, the undersigned, consent that I have read through and submit that this is the true position of Environmental and Social Impact Assessment Summery Project Report for Proposed Up-grading and Rehabilitation of Thiha Micro Irrigation Project Located in Thuci & Mbugwa Villages, Mutundu Sub-Location, Rutune Location, Mukurweini Constituency in Nyeri County.

Name:_____

Date_____

Signed:_____ **Designation:**_____

Thiha Micro Irrigation Project

P.O Box 164 Mukurweini

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ACRONYMS AND ABBREVIATIONS

CGN	County Government of Nyeri
CPR	Comprehensive Project Report
CSA	Climate Smart Agriculture
DOHSS	Directorate of Occupational Health and Safety Services
EA	Environmental Audit
EHS	Environmental, Health and Safety
ESIA	Environmental and Social Impact Assessment
EMCA	Environmental Management and Co-ordination Act
ESMMP	Environmental and Social and Social Management Plan
GHG	Green House Gases
GI	Galvanized Iron
GOK	Government of Kenya
Ha	Hectares
HIV/AIDS	Human Immuno-Virus/Acquired Immuno-Deficiency Syndrome
ISO	International Standard Organization
ITCZ	Inter-Tropical Convergence Zone
Km	Kilometers
M	Meters
Masl	Meter above sea level
MSDS	Material Safety Data Sheets
NEMA	National Environmental Management Authority
NO _x	Nitrogen oxide
O & M	Operation and maintenance
Omuwasco	Othaya Mukurweini Water and Sewerage Company Limited
OPs	Operation Procedures
PPEs	Personal Protective Equipment
SERC	Standards and Enforcement Review Committee
SGBV	Sexual and Gender Based Violence
SOPs	Standard Operation procedures
WRA	Water Resources Authority
WRUA	Water resource Users Association

EXECUTIVE SUMMARY

The proposed project up-grading and rehabilitation of existing Thiha Micro Irrigation Project at GPS Coordinates; 0°37'13.2"S 37°09'33.6"E is intended to increase the supply of water for irrigation and domestic use from the current 350 households to 1056 households. The project contributes to the KCSAP broad objective since it is expected to supply water for irrigation for increased production and productivity of beans, sweet potatoes, banana as well as milk and indigenous chicken. The project is supported by the Kenya Climate Smart Agriculture Project (KCSAP) through the funding of the World Bank and the County Government of Nyeri (CGN) at an estimated cost of the project is Kshs. 45,232,750.

The environmental and social impact assessment summery project report has been prepared in accordance to Environmental Management and Co-ordination (Amendment) Act (No. 5 of 2015& 2019) and Part II of the Environmental (Impact Assessment and Audit) Regulations 2003 the NEMA public notice 31 on processing of EIA reports of 12th March 2020. The objective of this ESIA (SPR) was to assess the environmental and social impacts of the proposed project, propose appropriate mitigation measures and make recommendations on the approval by NEMA and ultimate implementation.

The ESIA (SPR) methodology included environmental and social screening, environmental and social scoping, desk review, field visit, public participation and stakeholder consultation and report writing. The methods used in public participation and stakeholder consultation included two (2) public meetings, two (2) focused group discussion, five (5) key informant interviews and data collection using structured questionnaires form 11 stakeholders including vulnerable and marginalized persons. The meeting were held on the 11th January 2021 and 5th May 2021 where a total of 150 people (98 male, 52 female) participated. A detailed report on the outcome is presented in chapter four of this report.

The major issues raised during the public participation and stakeholder consultation included irrigated area per member, project operation and maintenance, varieties of banana, beans and sweet potatoes, adherence to COVID-19 guidelines and inclusion of youth in the project. The responses to this concerns included irrigating 0.25 acres as recommended in the design, members to make contribution on a monthly basis for maintenance, seeking advice from the department of agriculture on the suitable varieties, observing COVID-19 protocols during all public meetings and including the youth at all the stages of the project cycle.

The major negative impacts during construction included soil erosion, solid and liquid waste generation, biodiversity loss, occupational health safety, risk of spread of COVID-19 and sexual harassment by workers on site. The major negative impacts during operation include soil salinization and water logging, increased use of agricultural inputs, increased incidences of water borne diseases, social conflicts and gender violence and abuse at community level. A comprehensive environmental and social management and monitoring plan (ESMMP) is presented in chapter six of this report to mitigate any negative impacts.

Based on the findings of the assessment the proposed project is not likely to result into significant negative impacts. It is therefore the view of the experts that the project be allowed to proceed and recommends approval by National Environmental Management Authority (NEMA) subject to an annual audit. The experts further recommends that the reports be shared with the selected contractors for the implementation of the contractors specific ESMMP. The County Project Coordination Unit (CPCU) through the CESSCO in consultation with relevant stakeholders shall monitor the implementation of the ESMMP and report on compliance.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Thiha micro irrigation project in Thuci & Mbugwa Villages, Mutundu Sub-Location, Rutune Location, Nyeri County at GPS Coordinates; 0°37'13.2"S 37°09'33.6"E. was initiated in 2010 with a target population of 350 households with main water use being domestic and minor irrigation. The project was proposed by Thiha Micro Irrigation Self-Help Group which comprise of 1056 members 479 males and 577 females in Mukurweini Constituency to assist in upgrading and expansion of the distribution network and also rehabilitation of the intake. The main objectives of the project is to increase the supply of water for domestic use, livestock watering and small-scale irrigation to the residents of Thuci & Mbugwa Villages in Mutundu Sub-location, Rutune location, Mukurweini Sub-County. This is expected to increase production and productivity of banana, beans and sweet potatoes as well as enhance milk and indigenous chicken production and productivity hence contributing to the KCSAP broad objective.

The existing old infrastructure consists of an intake works along Thiha River, mainline and distribution lines (5km), field irrigation systems among other related facilities. The proposed up-grading and rehabilitation will include expansion and rehabilitation of intake works, addition of a parallel mainline and replacement of sections of the pipeline and associated pipeline facilities covering a distance of 16 kms, once complete the project will serve a total of 1056 households. The project is supported by the Kenya Climate Smart Agriculture Project (KCSAP) through the funding of the World Bank and the County Government of Nyeri (CGN). The estimated cost of the project is *Kshs. 45,232,750*.

1.2 Project Justification

The area lies in the lowland neighboring Muranga area which is normally dry where droughts and crop failures are frequent. However, the area is traversed by Thiha River among other seasonal streams arising from the slopes of the Aberdares. The river is a tributary to Sagana River. During the dry periods food usually becomes a problem and the local community depends on food from other areas in the county. The proposed project is a community-based project with aim in supplying water for domestic and subsistence irrigation in the area. Farmers in the area have fertile agricultural land which however cannot have optimal economic use due to poor rainfall patterns. This has in turn led to food insecurity, malnutrition among children,

environmental degradation, inability to access education and health services. The project is aimed at increasing household incomes and productivity of agricultural land in the area. The long-term objective of the project is to enhance horticultural production by introducing various high value crops, which will increase the farmers' economic status and consequently, the standards of living. The main beneficiary is the entire community of Thuci & Mbugwa Villages in Mutundu Sub- location, Rutune location. It anticipated that the community will be empowered and a number of auxiliary activities carried out by the community for income generation and improvement of livelihood. Overall, the project objectives are in conformity with the development objectives and with the current development policies of the Government of Kenya. The project is a key intervention towards realization of Vision 2030 strategy that aims at propelling Kenya to medium income status in the next 20 years.

1.3 Justification of Summery Project Report

This ESIA (SPR) was based on the recommendation of the County Director of Environment (CDE) following the environmental and social safeguards screening report. The report has been undertaken to fulfill the legal requirements as outlined in Sections 58-69 of the Environmental Management and Co-ordination (Amendment) Act (No. 5 of 2015& 2019) and Part II of the Environmental (Impact Assessment and Audit) Regulations 2003 and the NEMA public notice on processing of EIA reports of 12th March 2020.

1.4 Objective of the SPR

The specific objectives of the SPR are to:

- Collect and analyze baseline information for physical, biological and socio-economic environments in the project area
- Discuss the legal and regulatory issues associated with the proposed project;
- Predict and assess the potential impacts of the project
- Propose appropriate mitigation measures for any negative impacts and enhancement measures for the positive impacts resulting from implementing the project
- Conduct public participation so as to incorporate their views during project implementation
- Prepare an environmental and Social Impacts management plan
- Prepare a Summary Project Report (SPR) for submission to NEMA for approval.

1.5 Methodology of SPR

The Environmental and Social assessment is based upon desk studies, field assessments,

discussions with the proponent and stakeholders; and has been carried out in the following key steps:

- **Environmental and social screening:** This was conducted by the county environmental social safeguards and compliance officer and presented to County director of environment who recommended the ESIA (SPR) based on the risk categorization that the proposed project is a low to medium risk project(annex 1).
- **Environmental and Social scoping** to map out the possible environmental and social issues related to the proposed project.
- **Desk review for the secondary information** related to the project including the relevant laws and regulations
- **Site visit** for physical assessment of the project site and activities including the surrounding areas
- **Public participation and stakeholder consultation:** This involved two(2) public meetings, two(2) focused group discussions, five(5) key informant interviews and data collection using structured questionnaires from 11 respondents. The outcome is presented in chapter four of this report
- **Preparation of the summery project reports** as per the in the NEMA public notice 31 on processing of EIA reports of 12th March 2020.

1.6 Summery Project Report Structure

This report has seven chapters including section 1 which provides an introduction to the project outlining the background, justification of the project, project justification and SPR methodology. Section 2 outlines the nature of the project including the design and estimated cost Section 3 give the description of the location of the project. Section 4 presents the outcome of the public participation and stakeholder consultation process. Section 5 describes the potential environmental and social impacts of the proposed project associated with the construction, operation and decommissioning phases. Section 6; presents an environmental and social impacts management and monitoring plan (ESMMP), while Section 7; Presents the Conclusion and Recommendation followed by references and annexes.

CHAPTER TWO

NATURE OF THE PROJECT

2.1 Introduction

This chapter presents the existing infrastructure of Thiha Micro Irrigation project, description of the design for the proposed upscaling and rehabilitation works, the proposed activities, equipment and materials and the estimated project cost

2.2 Existing Infrastructure

The existing infrastructure of Thiha Micro Irrigation project include the impounding intake weir across Thiha River, the off take structures, collection chamber, draw off structures and about 10km gravity main.



Photo 1: Existing Intake works



Photo 2: Existing gravity main line along the river



Photo 3: Inspection chamber for existing gravity main line along the road



Photo 4: Proposed site for gravity main line

Figure 1: Existing Infrastructure

2.3. Project Design for the proposed upgrading and rehabilitation

The proposed up-grading and rehabilitation of Thiha micro irrigation project (see sample drawings in annex 16 and details in design report) will include

- Completion of remaining (16km mainline and distribution lines)

- Expansion and rehabilitation of intake works including de-silting and embankment
- Replacement of worn out and leaking pipes along the gravity pipeline
- Replacement of associated pipeline installations such as air valves, wash-out chambers and anchor blocks.
- Replacement of sections of the pipeline and associated pipeline facilities

2.4 Proposed Project Activities

2.4.1 Construction Phase

a) Preliminary Activities

- Initial site meeting to introduce the contractor to the site by the client
- Mobilization of machinery and materials
- Setting up of the site as per the site layout plan

b) Expansion and rehabilitation of the intake

The specific works include

- Construction of a 10m long of the left wing wall using a grade C20/C25 mass concrete to reduce the excessive silt from the road Kangurwe to Kiuu marram road
- Fixing a pedestal gate fixed on the right side of the intake to allow the cleaning of the weir during heavy floods

c) Construction activities (mainline, distribution, lateral and branches)

This will include excavation works for pipelines will be done by labor intensive methods in order to involve the beneficiary community. The specific works for these structures will include trenching and backfilling, carrying and transport of pipes and fittings, fitting of various pipe components.

d) Construction of the Gravity main line

Gravity mainline activities will include routing, clearing, trenching, pipe laying and burying of the trenches. Hand tools will be used in the trenching and backfilling. The trenches will vary in depth depending on the terrain on the pipeline route. The main delivery line will be from the intake to the reservoir, where 12-inch pipes will be used. Eight-inch pipes will continue to the reservoir before reducing into six-inch diameter pipes.

e) Establishment of in field system

This will involve installing feeder lines for each farmer to supply irrigation water at farm level.

The line will comprise of delivery pipe and a hose pipe, two hydrants stand pipe, hose nipple arrangements spaced at 10m, sprinklers and risers

2.4.2 Operation and Maintenance

The project operates as a community-based project whose running is through a management committee. The maintenance work will include

- Checking intake works (blockage and damages on the coarse and fine screens and ensuring no obstruction of flow to or near the weir and inlet chamber)
- Removal of silt accumulation on the intake works
- Daily monitoring of the pipeline route to detect leaks and damage on pipes
- Checking air-release valves, inspection chambers and washout working conditions.
- Maintenance infield systems by the farmers

2.5 Equipment and materials

The equipment include concrete mixer, excavation equipment and compacting machine. The main material to be used include gravity mains/pipeline, anchor blocks to check on thrust force, air valves, branch off take to prevent vacuum build up, control valves to be installed at all junction of branches and feeders, washouts to be led safely to natural waterway, river crossings and other crossing which includes road, gulley/path and stream crossings and ½ an inch diameter pipes to distribute water to the households. The other materials include Construction materials (e.g., cement, stone, crushed rock and gravel aggregates from approved quarries, sand, GI and uPVC pipes and fittings, and jointing materials); water for construction purposes and fuels for the trucks and machines.

2.6 Waste generation

The wastes likely to be generated includes spoiled and used construction materials; earthwork's spoil; solid waste (paper, plastics, metal cans, wood, metal, dry paint and stone chippings); liquid waste (wet paint, wastewater, glue, solvents and other chemicals); used oil waste products (e.g., lubricants and filters) from construction machinery; waste mortar and concrete and sanitary waste.

2.7. Project Cost

The project is estimated to cost **Kshs 45,232,750** including the cost of implementation of the Environmental and Social management and monitoring Plan

CHAPTER THREE

THE LOCATION OF THE PROJECT

3.1 Introduction

This chapter present a detailed description of the project site including proof of land ownership and conformity to land use plan

3.2 Description of the Project location

3.2.1 Geographic Location

The project supply area is located in Thuci & Mbugwa Villages, Mutundu Sub-Location, Rutune Location, Nyeri County. The intake work is located along Thiha River on GPS Coordinates: 0°37'13.2"S 37°09'33.6"E.



Figure 5: GPS Location of the project site (Source Google Earth)

3.2.1 Proof of Land Ownership

The project land site Title No. Muhito/Kariara/302 measuring 0.2 where the main irrigation infrastructure is constructed is a public land under the custody of the County Government of Nyeri (Annex 3). The other irrigation infrastructure for distribution of irrigation water to the farms will be on individual farms. The farmers have given there authorization as presented in Annex 4.

3.2.3 Climate

The average rainfall ranges between 500 mm - 2,400mm. The area experiences Equatorial rainfall due to its location and being within the highland equatorial zone of Kenya. The average

daily temperature throughout the year varies slightly from month to month with average temperatures of around 17⁰C during the months of July and August to about 20⁰C in March. But the daily range is much higher, with the differences between maximum and minimum temperatures each day around 10⁰C in May and up to 15⁰C in February. Between the months of June to September, southeast winds prevail in the coastal parts of Kenya and last up to several days without a break.

3.2.4 Geology and soils

The terrain is rugged with north-south running ridges and drained on either side by south running rivers. The slopes range from 30% to 45% towards NNE and SSW. The area is covered by porphyritic olivine basalts and basaltic agglomerate. The soils are the derivatives of the same that consist of black cotton soil

3.3 Supportive environmental and social management infrastructure

The town is well served, with good communication and transport network such as air, road, and railway. This network will facilitates easy coordination and transportation waste from the site to designated sites as well as transportation of workers in case of an emergency like injuries or accidents. The area is also served with adequate health facilities to handle any workers injuries on site as well as any ill health during construction and operation phases of the project.

3.4 Conformity to Land Use Plan and Zonal Plan

The land around the project site is majorly freehold with most land belonging to individuals. The project land site is a public land designated for a cattle watering trough as per the land search (annex 3). The proposed project involves upscaling and rehabilitation of existing infrastructure and therefore its implementation in line with the land use plan and zonal plan of the County Government of Nyeri.

CHAPTER FOUR

PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATION

4.1 Introduction

Public Participation and stakeholders consultation was conducted as stipulated in the Kenya constitution 2010, County Government Act and Section 17; of the Environmental (Impact Assessment and Audit) Regulations 2003 states that an EIA Study should “*seek the views of persons who may be affected by the project.*” This chapter presents the outcome of the public participation and stakeholder consultation process.

4.2 Objectives of Public Participation and Stakeholder Consultation

The objectives of public consultations for an SPR exercise in Kenya are to:-

- Ensure that all stakeholders and interested parties, are fully informed of the proposed project , its objectives and scope
- Seek the views, concerns and expectations of the people on the proposed project
- Find out if there are any environmental and social issues that the establishment of the proposed project and obtain suggestion from community members on possible ways that they feel potential negative environmental and social impacts can be effectively mitigated
- Ensure that any issues resulting from this process are addressed in the ESMMP and incorporated into the design and implementation of the project.
- Ensure that consultation is done on sensitive issues and that baseline information is established for management of any impacts that may arise during implementation and operation phase of the project.

4.3 Categorization of Community participants and stakeholders

The participants and stakeholders were categorized based on their relevance to the proposed project. The main stakeholders consulted were the offocials and members of Thiha micro irrigation water project self help group. The other stakeholders included officer from the deprtment of Agriculture and department of irrigation, chiefs and assistant chiefs within the project catchment area, community members using water from the abstacted river, the women, the youth and differently abled persons (see annex 14).

4.4 Methodology of Public Participation and Consultation

Public participation process involves two (2) public participation meetings, two (2) focused group discussion with the youth and women and key informant interviews. Data was also collected using structures questionnaires from 11 stakeholders including the 3 official of Thiha micro irrigation self-help group official, 2 chiefs, 2 Assistant chiefs, County director of agriculture, Sub County Agricultural officer, ward Agricultural officer, and Sub County water officer. The questionnaires were later analyzed and issues raised incorporated in identification of impacts in chapter 6 of this SPR. The sample administered questionnaires including all the questions asked are included in this report as *Annex 9*. The forums were held on the 11th January 2021 and 5th May 2021 where 150 people (98male, 52 female) participated (attendance list in Annex 8). *Covid-19 guidelines were followed during the whole exercise through proper social distancing, sanitizing and wearing of masks*. The views of the respondent were documented (see minutes annex 7)

4.5 Summary of Issues Raised by the Community and Stakeholders and Response

It was the view of the community that the project will benefit them. They however raised the following issues.

- **Size of irrigated land per member:** It was agreed that the maximum size of the land per member should be 0.25 acres as recommended in the design
- **Suitable banana, beans and sweet potatoes varieties under irrigation;** The officer from the department of agriculture committed to organize a sensitization meeting to discuss with the farmers on the suitable varieties
- **Operations and maintenance of the irrigation infrastructure:** It was suggested that each member to pay a user charge to assist in the maintenance of the irrigation infrastructure.
- **Inclusion of the youth, women and differently abled persons in the project:** It was agreed that the youth, the women and differently abled persons shall be given priority in employment during construction and operations phase of the project
- **Social conflict in the use of the water:** It was agreed that a water use committee shall be established to coordinate and oversee the use of irrigation water and handle any complaints that might arise during the operation phase of the project

CHAPTER FIVE

POTENTIAL IMPACTS AND MITIGATION MEASURES

5.1 Introduction

In order to get a basis for identification of impacts that are most relevant to the local context the most common environmental impacts of irrigated agriculture that have been encountered worldwide will be described in this section

5.2 Potential environmental and social impacts during construction

5.2.1 Positive Impacts

a) Creation of employment

With the implementation of the project, there will be employment opportunities for not only those who will be providing manual work, but also those providing professional works and consultancy. The activities involved in the construction, maintenance and management of the proposed project will generate employment i.e., employees involved in the production, sale and transportation of the building's materials, construction of the irrigation scheme, Security services, cleaning and waste collection are also some of the services that will benefit indirectly.

b) Market for construction Materials

The project will require supply of large quantities of construction materials most of which will be sourced locally in and around Rutune area. This will provide a ready market for building materials therefore offering a market for these goods and services promoting the primary and secondary sectors involved in their procurement.

5.2.2 Negative environmental and social impacts during construction

5.2.2.1 Environmental Impacts and Mitigation Measures

a) Soil Erosion

There is likely to be soil erosion resulting from the earthworks during intake expansion and along the pipelines.

Mitigation measures

- During construction, earthworks should be controlled so that land that is not required for the works is not disturbed;
- Where possible, excavation should be carried out during the dry spell to prevent soil from being washed away by the rain;
- Excavated materials and excess earth should be kept at appropriate sites approved by

the construction supervisor;

- Areas that are cleared for excavation should be planted with grass once the pipeline is laid

b) Exhaust and noise emissions

Reduction in the quality of air during the construction phase is anticipated and could affect public health. In addition, excavation work to lay irrigation pipelines will cause noise, dust and odor nuisance to residents of the area.

Mitigation measures

- Properly maintain construction equipment's and trucks in order to keep noise and exhaust emissions to a minimum;
- Control dust emissions and odors by sprinkling water and by good housekeeping practice;
- Workers subject to unacceptable noise levels will wear earplugs and their working time within these areas should be limited

c) Generation of Solid and Liquid waste

Construction equipment generates waste oil and its proper handling is critical since haphazard storage and leakage can result in contamination of soils, surface and ground waters. Although, pollution of water and soils by oil-based pollutants during construction works could cause health problems for the population, this risk is considered insignificant in the proposed works since mainly labor-intensive methods will be used for excavation.

Mitigation measures

- Waste management should comply with EMCA (Waste Management) regulations;
- The construction supervisor will be required to include environmental considerations in monthly progress reports and indicate progress in the implementation of mitigation measures as outlined in the EMP;
- Designated garbage storage areas should be provided during construction and the contractor should be responsible for handling and disposal of all construction and related waste;
- Waste disposal by burning should not be permitted and signage should be erected to ensure that the workers are sensitized to the waste disposal and handling issues on site;
- Recycling is the most desirable option for 'disposal' of any waste materials resulting from the construction. The contractor should, as much as possible put to good and acceptable

use any materials damaged or rejected for use on site

d) Biodiversity loss

Whereas some vegetation will be cleared along the pipeline route, this removal is considered insignificant since the area is already arable. There are no nature conservation interests in the project area therefore no significant impact is expected on flora and fauna.

Mitigation measures

- Except to the extent necessary for carrying out the construction works, vegetation should not be removed, damaged or disturbed;
- Existing cleared or disturbed areas should be used for construction of temporary structures and stockpiling of materials;
- Construction staff should be encouraged to trim trees rather than remove them;
- Planting of vegetation should be undertaken after the pipes are covered with soil.
- Avoid felling indigenous trees

5.2.2.2 Negative Social Impacts and Mitigation Measures

a) Occupational health and safety

Anticipated health and safety risks will include; fire, inhalation of fumes, physical injury from workplace accidents.

Mitigation measures

- Adhere to Occupational Health and Safety rules and regulations as stipulated in the Occupational Safety Act of Kenya of 2007 and revised in 2010.
- Sensitize and train all employees on occupational health and safety measures
- Provide adequate first-aid facilities in the project sites to handle medical emergencies during construction
- Provide appropriate PPE's to all workers
- Should there be an accident, the injured person should be given first and immediately taken to the hospital and investigation initiated immediately to ascertain the cause of accidents and preliminary report released within 12 hours

b) Risk of Spread of COVID-19

There is of workers and the community contracting COVID-19 disease because of the interaction which will take place during construction of the various components of the project.

Mitigation measure

- All workers on site should maintain physical distance of no less than one meter from the next person;
- All workers on site should use a proper face mask that must cover the person's mouth and nose;
- Provide at the construction site a handwashing station with soap and water or an alcohol-based sanitizer approved for use by the Kenya Bureau of Standards; and
- The constructor should provide all workers on site with appropriate PPEs.

c) Risk of Spread of HIV/AIDS and other STIs.

Sexual relationships between community members and the construction workers may result to HIV/AIDs in the area.

Mitigation Measures

- The contractor should ensure that all construction workers are sensitized prevention and control of STIs/HIV/AIDs
- The contractor should provide adequate prevention measures such as condoms to the community and construction workers
- The contractor should comply with the provisions of the HIV/AIDs prevention policy

d) Sexual harassment by workers on site

This is likely to occur if the rights of women as stipulated in the Gender policy 2011 and 1/3 rule is violated by construction workers and the contractor hiring workers on site.

Mitigation Measures of Human Rights and Gender Requirements are.

- Sensitize construction workers against sexual harassment
- The Contractor shall require his 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 sexual exploitation and abuse

5.3 Potential environmental and social impacts during operation**5.3.1 Positive Impacts**

- a) **Increased agricultural productivity:** There will be increased productivity of banana, beans and sweet potatoes as well as milk and indigenous chicken as a result of the reliable supply of irrigation water.
- b) **Increased incomes** from the increased sales of crops and livestock produce due to increased productivity and production
- c) **Improved Food Security:** Through increased water moisture availability/accessibility to crops during crop growing seasons there will be an increase crop production which will enhance food security in among households in the area. The project will increase area under crop production and hence lead to increased agricultural output and productivity lowering the food prices.

5.3.2 Negative Environmental and Social Impacts

5.3.2.1 Negative Environmental Impacts and Mitigation Measures

a) Water logging and salinization of soils:

These problems are associated with surface irrigation and result in soil deterioration. Water logging concentrates salts, drawn up from lower in the soil profile, in the plants' rooting zone. Alkalization (the build-up of sodium in soils) is a detrimental form of salinization that can be reduced or minimized by using sprinkler or drip irrigation which apply water more precisely and can more easily limit quantities to no more than the crop needs

Mitigation Measures

- The amount of water abstracted from the river should be controlled through appropriate design of the intake to include facilities for regulating irrigation pipe's discharge
- The Project Management Committee (PMC) should ensure installation of appropriate drainage channels to drain any excess water from the farms.
- The proponent should frequently monitor soil salinity through analysis of soil carried out before project implementation and with every annual audit
- The proponent should ensure maintenance and operation of the irrigation infrastructure should be maintained regularly to ensure that localized irrigation does not occur

b) Deterioration of water quality

The irrigation project can render the water unfit for other users, harm aquatic species and because of high nutrient content, result in aquatic weed growth that clogs water ways and has health, navigation and ecological consequences.

Mitigation Measures

- The local agricultural officers' services should train farmers on fertilizer use and the safe

use of agro chemicals as well as use of integrated pest management

- The proponent should prepare and implement pest management plan and seek for clearance before commencement of farming activities
- The proponent should ensure proper disposal of wastes

c) Soil erosion

Intensive agriculture as a result of irrigation will cause soil erosion if preventive measures are not put in place. In addition, sprinkler irrigation on steep slopes might generate erosion. It is necessary that slopes be stabilized with Napier grass planted along contours before irrigation is undertaken.

Mitigation measures

- Minimize and plainly define land clearing areas;
- Construct gabion and plant vegetation cover to conserve the river banks
- Avoid to clearing vegetation along Thiha River;
- Avoid steep slopes and level the land/terrace the slopes as much as possible;
- Protect the soil against erosion by good farm management practices such as agroforestry and contour farming;
- Public awareness programs should be conducted during project implementation to ensure that members, RUA and project management understand and take up their role in catchments' management;
- Train farmers in soil and water management to avoid land degradation

d) Increased use of agricultural inputs especially fertilizers and pesticides

The key environmental issue during operation will be the increased use of agricultural biocides (insecticides, herbicides, fungicides etc.) and fertilizers due to expected intensification of agricultural activities in the project area. Production of horticultural crops will demand increased use of biocides many of which are toxic and can have a long-term effect in soils.

Mitigation measures

- Integrated Pest Management Practices incorporating crop management control techniques, biological control and restricted use of biocides are recommended in order to lessen the adverse effects of biocide use;
- The project management in collaboration with stakeholders such as Ministry of Agriculture and PCPB should train farmers on adequate amounts of fertilizers and biocides

to be used for various crops and on safe use of these chemicals;

- Sprinkler method of irrigation is efficient for application of water and should be used effectively to alleviate the effects of agricultural biocides

e) Aquatic weed growth

There is a potential risk regarding the growth of aquatic weeds at the intake site. Such weeds will cause obstruction and increase standing waters and disease vector breeding sites at the intake works.

Mitigation measures

- Manual removal of weeds at the intake every season.

5.3.2.1 Negative Social Impacts and Mitigation Measures

a) Increased incidence of water related diseases

There is a likelihood of proliferation of disease vectors in irrigation waters. Other irrigation-related health risks include those associated with increased use of agrochemicals, deterioration of water quality, and increased population pressure in the area;

Mitigation Measures

- The members of the community should be sensitized on preventive and control measures.
- These measures include spraying and use of treated nets for malaria control.
- Construction of pit latrines should be encouraged to control diseases.
- The Ministry of public health should ensure there is regular spraying within the project area to control mosquitoes
- Regular flushing of stagnated water to destroy breeding grounds.

b) Gender Based Violence (GBV) at community level

This may arise because of the sharing of the increased proceeds from produce sold due to increased productivity as a result of reliable source of water for irrigation

Mitigation Measures

- The proponent should ensure that community members are sensitized on GBV
- The proponent should comply with the provisions of the GBV policy to safeguard the community against the vice

c) Water Use conflicts

The irrigation infrastructure is a shared resource by members of the community and therefore there is a likelihood of conflict in the use of irrigation water among beneficiary farmers.

Mitigation Measures

- The beneficiary community will be sensitized on the project operations before handing over
- Establishment of Project management Committee to oversee the implementation of the project
- Developing clear by laws to guide the implementation process
- Instituting a grievance redress mechanism at community level to handle any conflict that might arise.

d) Risk of workers injuries and accidents

This is likely to occur during maintenance of irrigation infrastructure by workers and members of the project management

Mitigation Measures

- All workers on site to wear full protective gear (PPEs)
- The proponent to liaise with relevant institutions to train workers on administering first aid, and provide a functional first aid kits
- The proponent shall ensure that only qualified personnel carry out operations and maintenance at the site.

5.3 Potential impacts during Decommissioning

The project is expected to last for some years and therefore decommissioning may not be anticipated in the near future thereby reversing the positive impacts identified. The main negative impacts at this phase are mainly losses in the irrigation infrastructure. Other notable negative impacts include

a) The generation of solid waste

Solid waste will be generated from the demolition of irrigation infrastructure

Mitigation measures

- The wastes produced should either be reduced, reused or recycled
- Provide waste disposal bins at appropriate sites
- Waste disposal sites should be located away from the water sources to prevent the possibility of surface run off into the water system.

b) Loss of livelihood income

The beneficiaries are likely to lose the income due to reduced production due to lack of reliable source of water for irrigation

Mitigation measures.

- Sensitize the public on how to cope up with loss of livelihoods
- Sensitize the farmers to diversify livelihood enterprises.

c) Occupational health and Safety risks

It is expected that employees are likely to encounter occupational health risks due to accidents during decommissioning. Because of demolition activities, workers are exposed to risks of accidents and injuries. Injuries can arise from use of tools and equipment. The injuries can include cuts and bruises.

Mitigation Measures

- Sensitize the decommissioning team on occupational health and safety
- Adhere to Site Occupational Health and Safety rules and regulations as stipulated in the Occupational Safety Act of Kenya of 2007 and revised in 2010.
- Sensitize the all workers on occupational health and safety
- Provide adequate first-aid facilities in the project sites to handle medical emergencies during demolition
- Provide adequate PPE's to workers during construction

CHAPTER SIX

ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

6.1 Introduction

The ESMMP is meant to provide guidelines for concerns identified so as to promote the mitigation of identified adverse effects throughout the design, construction, operation and decommissioning phases so as to promote the positive effects. The proponent should acquire the technical assistance and training in environmental management practices for operations of the proposed project.

The ESMP provides a general outlay of the activities, associated impacts, mitigation action plans and appropriate monitoring action. It also defines implementation timeframes and responsibilities. The environmental and social management and monitoring will involve a continuous surveillance of performance of specific functions during the construction, operation and decommissioning phases of the project.

6.2 Environmental and Social Management and Monitoring Plan

6.2.1 Environmental Management and Monitoring Plan during construction

Environmental Impact	Proposed Mitigation measures	Monitoring Indicators	Responsibility	Means of Verification	Time frame	Est. Cost (KES)
Soil erosion	<ul style="list-style-type: none"> During construction, earthworks should be controlled so that land that is not required for the works is not disturbed; Where possible, excavation should be carried out during the dry spell to prevent soil from being washed away by the rain; Excavated materials and excess earth should be kept at appropriate sites approved by the construction supervisor; Areas that are cleared for excavation should be planted with grass once the pipeline is laid 	<p>No. of soil conservation structures laid</p> <p>Area planted with grass</p>	Contractor Supervising Engineer	Site Report Photos	6 months	50,000
Exhaust and noise emissions	<ul style="list-style-type: none"> Properly maintain construction equipment's and trucks in order to keep noise and exhaust emissions to a minimum Control dust emissions and odours by sprinkling water Workers subject to unacceptable noise levels will wear earplugs and their working 	<p>No of hour worked per day</p> <p>No of workers provided with earplugs</p>	Contractor Supervising Engineer	Site Report Daily monitor report	6 months	20,000

	time within these areas should • be limited					
Generation of Solid and Liquid Waste	• Waste management should comply with EMCA (Waste Management) regulations; • The construction supervisor will be required to include environmental considerations in monthly progress reports and indicate progress in the implementation of mitigation measures as outlined in the EMP • Designated garbage collection areas should be provided during construction and the contractor should be responsible for handling and disposal of all construction and related waste • Waste disposal by burning should not be permitted and signage should be erected to ensure that the workers are • sensitized to the waste disposal and handling issues on site;	Volumes of waste generated No of designated garbage collection area No of signage erected on site on waste management	Contractor Supervising Engineer	Daily Monitor report Photos Signage	6 months	100,000

Biodiversity loss	<ul style="list-style-type: none"> • Except to the extent necessary for carrying out the construction works, vegetation should not be removed, damaged or disturbed • Existing cleared or disturbed areas should be used for construction of temporary structures and stockpiling of materials • Construction staff should be encouraged to trim trees rather than remove them • Planting of vegetation should be undertaken after the pipes are covered with soil. • Avoid felling indigenous trees. 	<p>Area cleared of vegetation during construction</p> <p>Area of land planted with grass and trees</p>	Contractor Supervising Engineer	Site Report Photos	6 months	n/a
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6.2.2 Social Management and Monitoring Plan during construction

Social Impact	Proposed Mitigation measures	Monitoring Indicators	Responsibility	Means of Verification	Time frame	Est. Cost (KES)
Occupational health and safety	<ul style="list-style-type: none"> Adhere to Occupational Health and Safety rules and regulations as stipulated in the Occupational Safety Act of Kenya of 2007 and revised in 2010. Sensitize and train all employees on occupational health and safety measures Provide adequate first-aid facilities in the project sites to handle medical emergencies during construction Provide appropriate PPE's to all workers Should there be an accident, the injured person should be given first and immediately taken to the hospital and investigation initiated immediately to ascertain the cause of accidents and preliminary report released within 12 hours 	<ul style="list-style-type: none"> No. of protective gears procured No. of employees trained on OHS measures No of first aid kits procured No. of accidents reported 	Contractor Supervising Engineer	Incidence Report Attendance list Photos	6 months	50,000
Risk of Spread of COVID-19	<ul style="list-style-type: none"> All workers on site should maintain physical distance of no less than one meter from the next person; All workers on site should use a proper 	<ul style="list-style-type: none"> No. of SOPs availed No. of workers with PPEs 	Contractor Supervising Engineer PHO	Daily Monitor Report Incidence Report	6 months	50,000

	<ul style="list-style-type: none"> face mask that must cover the person's mouth and nose; Provide at the construction site a handwashing station with soap and water or an alcohol-based sanitizer approved for use by the Kenya Bureau of Standards; and The constructor should provide all workers on site with appropriate PPEs. 	<ul style="list-style-type: none"> No. of sanitizing facilities No. of handwashing equipment installed 				
Risk of Spread of HIV/AIDS and STDs	<ul style="list-style-type: none"> The contractor should ensure that that all construction workers are sensitized prevention and control of STIs/HIV/AIDs The contractor should provide adequate prevention measures such as condoms to the community and construction workers The contractor should comply with the provisions of the HIV/AIDs prevention policy 	<p>No. of worker and community sensitized</p> <p>No. of condom dispensing equipment installed</p> <p>No. of meetings held for workers and community</p>	Contractor Supervising Engineer PHO	Daily Monitor Report Incidence Report	6 months	20,000
Sexual harassment by construction workers	<ul style="list-style-type: none"> Sensitize construction workers against sexual harassment The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to 	<p>No of people sensitized against sexual harassment</p> <p>No of incidences reported</p>	Contractor Supervising Engineer	Attendance list Incidence register/report Photos	6 months	20,000

	individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse					
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6.2.3 Environmental Management and Monitoring Plan during Operations

Environmental Impact	Proposed Mitigation measures	Monitoring Indicators	Responsibility	Means of Verification	Time frame	Est. Cost (KES)
Water logging and salinization of soils	<ul style="list-style-type: none"> The amount of water abstracted from the river should be controlled through appropriate design of the intake to include facilities for regulating irrigation pipe's discharge The Project Management Committee (PMC) should ensure installation of appropriate drainage channels to drain any excess water from the farms. The proponent should frequently monitor soil salinity through analysis of soil carried out before project implementation and with every annual audit The proponent should ensure maintenance and operation of the irrigation infrastructure should be 	<p>Level of adherence to intake design</p> <p>No of appropriate drainage channels installed</p> <p>No of soil salinity tests</p> <p>No of times of maintenance of irrigation infrastructure</p>	Proponent Sub County Water/Irrigation Officer	<p>Design Report</p> <p>Photos of site</p> <p>Monthly Reports</p> <p>Soil salinity test reports</p>	Entire O&M Phase	100,000

	maintained regularly to ensure that localized irrigation does not occur					
Deterioration of water quality	<ul style="list-style-type: none"> The local agricultural officers' services should train farmers on fertilizer use and the safe use of agro chemicals as well as use of integrated pest management The proponent should prepare and implement pest management plan and seek for clearance before commencement of farming activities The proponent should ensure proper disposal of wastes 	<p>No. of trainings conducted on safe use</p> <p>No of people trained on safe use of pesticides</p> <p>Level of implementation of pest management plan</p> <p>Level of adherence to appropriate waste disposal</p>	Proponent Sub county and Ward Agricultural Officers	Training Report Attendance list PMP implementation report	Entire O&M Phase	50,000
Soil erosion	<ul style="list-style-type: none"> Avoid to clearing vegetation along Thiha River; Avoid steep slopes and level the land/terrace the slopes as much as possible; Protect the soil against erosion by good farm management practices such as agroforestry and contour farming; Public awareness programs should be conducted during project implementation to ensure that members, RUA and project management understand and take up their 	<p>Area of land cleared of vegetation along Thiha river</p> <p>Length of terraces constructed along the slope</p> <p>No of public awareness meetings conducted</p>	Proponent Sub county and Ward Agricultural Officers	Monthly Reports Photos Attendance list	Entire O&M Phase	n/a

	<ul style="list-style-type: none"> role in catchments' management; Train farmers in soil and water management to avoid land degradation 					
Increased use of agricultural inputs especially fertilizers and pesticides	<ul style="list-style-type: none"> Integrated Pest Management Practices incorporating crop management control techniques, biological control and restricted use of biocides are recommended in order to lessen the adverse effects of biocide use; The project management in collaboration with stakeholders such as Ministry of Agriculture and PCPB should train farmers on adequate amounts of fertilizers and biocides to be used for various crops and on safe use of these chemicals; 	<p>No of farmers trained on recommended fertilizer application and safe use of pesticides</p> <p>No of integrated pest management practices incorporated in crop management</p>	Proponents Sub County and Ward Agricultural Officers	Monthly Reports Training Report Attendance list	Entire O&M Phase	50,000
Aquatic weed growth	<ul style="list-style-type: none"> Manual removal of weeds at the intake every season. 					

6.2.4 Social Management and Monitoring Plan during Operations

Social Impact	Proposed Mitigation measures	Monitoring Indicators	Responsibility	Means of Verification	Time frame	Est. Cost (KES)
Increased incidences of water borne diseases	<ul style="list-style-type: none"> The members of the community should be sensitized on preventive and control measures including 	<p>No of community members sensitized</p> <p>No of household with pit</p>	Proponent PHO	Attendance list Photo Incidence Report	Entire Q&M	20,000

	<p>include spraying and use of treated nets for malaria control.</p> <ul style="list-style-type: none"> • Construction of pit latrines should be encouraged control diseases. • The Ministry of public health should ensure there is regular spraying within the project area to control mosquitoes • Regular flushing of stagnated water to destroy breeding grounds. 	<p>latrines</p> <p>No of times of spraying by PHO</p> <p>No of incidences Reported</p>				
Gender Based Violence at community level	<ul style="list-style-type: none"> • The proponent should ensure that that community members are sensitized on GBV • The proponent should comply with the provisions of the GBV policy to safeguard the community against the vice 	<p>No of community members sensitized on GBV</p> <p>Level of compliance with GBV policy</p> <p>No of incidences reported</p>	Proponent Provincial administration Gender Officer	Attendance list Incidence Report	Entire O&M	n/a
Water use conflict	<ul style="list-style-type: none"> • The beneficiary community will be sensitized on the project operations before handing over • Establishment of Project management Committee to oversee the implementation of the project • Developing clear by laws to guide 	<p>No of community members sensitized on project operations</p> <p>No of PMC established GRM established</p> <p>Incidences reported</p>	Proponent Provincial administration	Attendance list Incidence Report	Entire O&M	n/a

	<p>the implementation process</p> <ul style="list-style-type: none"> • Instituting a grievance redress mechanism at community level to handle any conflict that might arise. 					
Risk of workers injuries and accidents during maintenance	<ul style="list-style-type: none"> • All workers on site to wear full protective gear (PPEs) • The proponent to liaise with relevant institutions to train workers on administering first aid, and provide a functional first aid kits • The proponent shall ensure that only qualified personnel carry out operations and maintenance at the site. 	<p>No of workers wearing appropriate PPEs</p> <p>No of incidences reported</p>	Proponent MoH	Incidence Report	Entire O&M	30,000

6.2.5 Environmental and Social Management and Monitoring Plan during Decommissioning

Environmental and Social Impact	Proposed Mitigation measures	Monitoring Indicators	Responsibility	Means of Verification	Time frame	Est. Cost (KES)
Generation of Solid waste	<ul style="list-style-type: none"> • The wastes produced should either be reduced, reused or recycled • Provide waste disposal bins at appropriate sites • Waste disposal sites should be located away from the water sources 	<p>Volumes of waste reduced, reused or recycled</p> <p>No of waste bins at appropriate sites</p> <p>No of designated waste</p>	Proponent Contractor	Daily Monitor Report Photos	Decommissioning period	n/a

	to prevent the possibility of surface run off into the water system.	disposal sites away from site				
Loss of income and livelihood	<ul style="list-style-type: none"> • Sensitize the public on how to cope up with loss of livelihoods • Sensitize the farmers to diversify livelihood enterprises. 	No of community members sensitized	New User Proponent	Attendance list Photos	Decommissioning period	n/a
Occupation health and safety risk	<ul style="list-style-type: none"> • Adhere to Site Occupational Health and Safety rules and regulations as stipulated in the Occupational Safety Act of Kenya of 2007 and revised in 2010. • Sensitize the all workers on occupational health and safety • Provide adequate first-aid facilities in the project sites to handle medical emergencies during demolition • Provide adequate PPE's to workers during construction 	No of people sensitized on health and safety Level of adherence to OS Act No of workers provided with appropriate PPEs	Proponent	Attendance list Daily monitor report Photos	Decommissioning period	n/a

CHAPTER SEVEN:

CONCLUSION AND RECOMMENDATION

7.1 Introduction

This chapter presents the findings of the environmental and social impacts and makes recommendations on approval by National environmental management authority (NEMA) and implementation.

7.2 Conclusion

Based on the findings the implementation of the proposed upscaling and rehabilitation of Thiha micro irrigation project will result into more positive impacts when compared to the negative impacts that will adequately mitigated as outlined in the ESMMP of this report. The negative impacts identified are of low magnitude and site specific and will therefore be easily be mitigated in all phases of the project.

7.3 Recommendations

It is the view of the experts that the proposed Thiha micro irrigation project be allowed to proceed on approval by NEMA subject to strict implementation of the ESMMP and annual audit. Furthermore the ESMMP should be shared with the selected contractor for implementation of the contractors specific ESMMP. The CPCU thorough the CESSCO in collaboration with relevant stakeholders shall monitor the implementation and report on compliance.

REFERENCES

- 1) Kenya gazette supplement Acts 2000, Environmental Management and Coordination Act Number 8 of 1999. Government printer, Nairobi
- 2) Kenya gazette supplement number 56. Environmental Impact Assessment and Audit Regulations 2003. Government printer, Nairobi.
- 3) Republic of Kenya (2012). The County Government Act, (2012), Government Printer, Nairobi.
- 4) Republic of Kenya (2012). The Land Titles Act Cap 282, Government Printer, Nairobi, Kenya
- 5) Republic of Kenya (2012). The National Land Policy, Government Printer, Nairobi.
- 6) Republic of Kenya (2012). The Physical Planning Act Cap 286, Government Printer, Nairobi, Kenya.
- 7) Republic of Kenya (2012) The Public Health Act, Laws of Kenya, Chapter 242. Government Printer, Nairobi, Kenya.
- 8) Republic of Kenya (2012); Environmental Policy Framework (2012), Government Printer, Nairobi.
- 9) Republic of Kenya (2016); Laws of Kenya: Water Act, 2016, Government Printer, Nairobi
Republic of Kenya (2006); Kenya Gazette Supplement Acts, The water Resources Management Rules (2007), Government Printer, Nairobi.

ANNEXES

Annex 1: Checklist for ESS Safeguards

Screening Checklist

KENYA CLIMATE SMART AGRICULTURE SCREENING CHECKLIST FOR ALL SUB-PROJECTS CARRIED OUT IN A SPECIFIC LOCATION (Filled and prepared by county level staff and community committee member and approved by the County Director of Environment (CDE) and NPCU environmental and social experts)

Project investment name
THIHA MICRO IRRIGATION PROJECT

County and location:
HYERI

Estimated cost (USD): Ksh 45,232,750.00

Objectives of the subproject: increase food production, increase irrigable area by 164 acres.

Activities to be undertaken: rehabilitation of water intake installation of main pipes, sub-main conveyance and distribution pipes installation of intake pipes

Will the Project?	Yes	No
1. Adversely affect natural habitats nearby, including forests, rivers or wetlands?		✓
2. Require large volumes of construction materials (e.g. gravel, stone, water, timber, firewood)?		✓
3. Use water during or after construction, which will reduce the local availability of groundwater and surface water?		✓
4. Affect the quantity or quality of surface waters (e.g. rivers, streams, wetlands), or groundwater (e.g. wells, reservoirs)?		✓
5. Be located within or nearby environmentally sensitive areas (e.g. intact natural forests, mangroves, wetlands) or threatened species?		✓
6. Lead to soil degradation, soil erosion in the area?		✓
7. Create waste that could adversely affect local soils, vegetation, rivers and streams or groundwater?		✓
8. Create pools of water that provide breeding grounds for disease vectors (for example malaria or bilharzia)?		✓
9. Involve significant excavations, demolition, and movement of earth, flooding, or other environmental changes?		✓
10. Affect historically-important or culturally-important site nearby?		✓

11. Require land for its development, and therefore displace individuals, families or businesses from land that is currently occupied, or restrict people's access to crops, pasture, fisheries, forests or cultural resources, whether on a permanent or temporary basis?		✓
12. Result in human health or safety risks during construction or later?		✓
13. Involve inward migration of people from outside the area for use of services or other purposes?		✓
14. Result in conflict or disputes among communities?		✓
15. Affect indigenous people, or be located in an area occupied by indigenous people?		✓
16. Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		✓
17. Result in a significant change/loss in livelihood of individuals?		✓
18. Adversely affect the livelihoods and/or the rights of women?		✓
19. May cause increased settlement or degradation of surrounding areas?		✓
20. Disposal of bush clearance residue may cause spreading of invasive species?		✓
21. Introduce a non-native animal or plant species?		✓
22. Involve handling of vet drugs and vaccines?		✓
23. Maintenance and management responsibilities have not been defined and accepted by concerned parties?		✓
24. Has not extensively consulted and included VMGs/IPs in the selection, planning and project benefits?		✓
25. Has not received wide community agreement on project including by VMGs/IPs?		✓

If you have answered Yes to any of the above, please describe the measures that the project will take to avoid or mitigate environmental and social impacts

What measures will the project take to ensure that it is technically and financially sustainable and well co-ordinated with other interventions in the area?

project management structure have three-sub-committee
Executive, Monitoring & Evaluation, SAIC.
monthly membership contribution of Ksh 2000 per person
- project will entail a plumber for maintenance
involve CTO/Agriculture & water dept for capacity building and
advice

If the answer to any of the questions is "Yes", please use the indicated Annexes or sections(s) of the ESMF, RPF and VMGF for guidance on how to avoid or minimize typical impacts and risks.

Expert Advice

Completed by County Project Implementation officer

Name: _____ Position /
Community: _____ Signature: _____
Date: _____ Tel _____
contact: _____

Approved by Community committee chair

Name: EUNICE KIMITHI Position TREASURES
Signature: _____ Date 26/06/2020 Tel _____
contact: 0720109 377

Checked and approved by:

Field Appraisal Officer (CDE)(NEMA)

Name: Yvonne M Signature: _____
Stamp Date: 23/7/2020
contact: 0780633286



Action plan (completed by Field Appraisal Officer) NEMA

Which course of action do you recommend?

☐ ESIA ☐ EIA ☐ ESMP ☐ RAP (RPF is the reference document with reference to resettlement issues) ☐ VMGP ☐ Other environmental/social plans

☐ There are no/negligible environmental or social risks

If a RAP is required, will the project displace or restrict access for less than 200 individuals, or if over 200, are losses for all individuals less than 10% of their assets?

If yes, prepare an abbreviated RAP

☐

If no, prepare a full RAP

Full details of resettlement requirements are provided in the accompanying Resettlement Policy Framework.

Checked and approved by:

NPCU Environmental Officer Name: _____ Signature:/Stamp _____
Date _____

NPCU Social Officer: _____ Signature/stamp: _____
Date _____

Annex 2: Certificate of Registration

Certificate No. 3665982


Republic of Kenya

MINISTRY OF LABOUR, SOCIAL SECURITY AND SERVICES

**Certificate of Registration of
Self-help Group/Project**

This is to certify that

THINA MICRO - IRRIGATION SELF HELP.

Group Name / Project

NYI/REG/CD/SL/470 Registration No.	24th JUNE 2008 Date of Registration
MUTUNDU Sub-location / Ward	MUKURWE INI Constituency
RUTUNE Location	MUKURWE INI Sub County
MUKURWE INI SOUTH Division	NYERI County

**is registered with the Office of the Sub County
Social Development Officer as a Self-Help
Group / Project**

Name County Social Development Coordinator	Signature.....
Name J. G. GICHERU Sub County Social Development Officer	Signature.....
17th AUGUST 2016 Date of Issue	FOR DISTRICT GENDER & SOCIAL DEVELOPMENT OFFICER MUKURWE-IN

Note: The Contents of this Certificate should not be erased, altered or defaced in any way.

Annex 3: Official Certificate of Land search for project Site

R.L. 27

REPUBLIC OF KENYA

THE LAND REGISTRATION ACT
No. 3 of 2012 (Section 108)
(Cap. 300) (Repealed)

1258/11/2020

CERTIFICATE OF OFFICIAL SEARCH

TITLE NO.: LOWEIA MATHIO KARIARA / 302
SEARCH NO. 2618
On the 26 day of NOV 2020 the following
were the subsisting entries on the register of the above-mentioned title:

PART A – Property Section (Easements, etc)
Nature of Title: RESERVED FOR CATTLE WATERING POINT
Approximate area: 0.2 (2000 square meters) ACRES

PART B – Proprietorship Section
Name and Address of the Proprietor:-
① 5.6.1959 COUNTY COUNCIL OF NUYET

Inhibitions, Cautions and Restrictions:-
4

PART C – Encumbrances section (Leases, Charges, etc)
u

The following applications are pending:
4

The certified copies requested are attached.
The minimum fee KSh. 500 (Five hundred only)
Dated this 26 day of NOV 2020

To: The Land Registrar,
District Land Registry,
P. O Box: _____
KSh. _____ attached hereto.

Land Registrar
0. 211

Signature of the applicant or his advocate


TO BE SUBMITTED IN DUPLICATE

GPK/SP/7401-108a-02/2012

Annex 4: Way Leave Authorization (List of Community members who authorized their land for use of Way Leave for the Project)

WAY LEAVE					
	NAMES	Id/No	Tel/No	Plot/No	Sign
1	Reuben Maina	10594282	0790171417	987	R
2	Peter Kimani Ndunge	9228275	0724701471	223	P
3	ASHOK NDEGWA KIBUGI	9552557	0726287532	283	A
4	TITUS MBUTHIA MUTHANGARI	11128099	0706569868	284	T
5	MILKA NJAMBI MUTHANGARI		0716489768	1	M
6	Joseph Njau		0717711104	286	J
7	Francis Mwangi		0714225298	286	F
8	Samuel Kamau	22085272	0724117968	286	S
9	Peter Irungu		0727588226	286	P
10	Monica Mugure Muthangari		0727800977	284	M
11	Glenn Wambui Mwangi	3615858	0767529717	769	G
12	KARANT KIRU	365896	0721728265		K
13	Abogo GATHUNGU	5558057	0718568666	766	A
14	Wilson Wagood Mwangi	11319035	0727504686	382	W
15	IRENE WAMBUI MURAH	22263284	0724145111	640	I
16	THOMAS WARUI WACHIRA	32087902	0725483902	639	T
17	Grace Wangui Mburu	10686037	0726538764	637	G
18	PETERSON WATHAKA MURU	9262347	0700367140	1105	P
19	ETIMARY WAMBUI MURU	4356293	0700367140	1106	E
20	ETIMARY WAMBUI WAMBUI	27152860	0714979147	1108	E
21	HARCY NJERI GATHAKI	3615794	0710436861	1109	H
22	LUCY WAMBURA KINTYA	027324358	0718468445	224	L
23	DAVID WANGAI MWAI	9322865	0714678351	661	D
24	TITUS MURAGE GICHUKI	16132076	0721154006	277	T
25	IRENE WAMBUI NGAIRA		0716703978	400	I
26	FATMA WAMBUI GICHUKI	5454998	0702401688	277	F
27	MARY WAMBUI MURUKU	9670383	0710862177	730	M
28	ISAIAH MWANGI	22416749	0720594461	222	I
29	MARY NANJIRO WANJOH	22101689	0712882275	221	M
30	P WAMBUI MURAGURI	4956149	0703286158	732	P
31	CHARLES CHOSE	6414826	0729441024	222	C

Annex 5: Water Abstraction Permit from Water Resource Authority (WARMA Provisional Licence)



WATER RESOURCES AUTHORITY

Upper Tana Sub-Region (Muranga)
Water Resources Authority,
P.O. BOX 304-10200
Murangā Kenya

Email: wrauppertana@gmail.com
Website: www.wra.or.ke

Ref No: WRMA/401/3/1Vol 3(160)

Date: 30th November 2020


TO WHOM IT MAY CONCERN

RE: PROVISIONAL LETTER TO ABSTRACT WATER FROM THIHA RIVER: BY THIHA MICRO WATER PROJECT.

Thiha Micro Water Project has applied for an authorization to abstract 1153.42m³/d of water from Thiha River for irrigation supply.
The relevant authorization application documents have been received by this office (Water Resources Authority –upper Tana Sub-Region).
The application was done to legalize the existing water works.

The authorization will be issued immediately it is finalized.

Kindly accord the project the necessary assistance they may require.


Lucy W. Njuguna
For: SUB-REGIONAL MANAGER

Accounting for Every Drop!

WRA is ISO 9001:2015 Certified

Annex 6: Photos of Public Participation Meeting



Annex: 7: Minutes of the public participation

THHA MICRO IRRIGATION WATER S. HELP AT
11/1/2020
AGM NGUYO-101 MEETING
Started with a prayer by Pastor Make
Sub-Chief - addressed the beneficiaries
Thiha Micro Irrigation project to follow all
directions of the president to take all
childrens ~~to~~ back to school. Also advy
the members to follow all the advice of Co
Agenda I. KESAP.
The recognised guests of this meeting
inclusive of, Speaker of County assembly, N
Ngũre (American boy), Gathuru assured
members of the above title that no
doubt that the KESAP is already in
process to help the needy members
this Rugi Ward drought area to up
the life of the needy members.
Agenda II. Contribution.
Agreed that all members must Con-
tribute the required money to cater the Mandator
documents.
Agenda III: Harambee
We agreed to have a harambee Contri-
bution on 6th February 21 in Nyayo-ini Cattle d.
Our guests as becomend above and proper
members as among them attached on the
According to there ~~att~~ attendance on the
AGM meeting.
Yours Obedience
Chairman - Richard Kaguc
Secretary - Mwangi Mai

5/5/2021

Committee meeting

present: Chairman - Richard Ragnucia
Vice chairman - Peter Kimani
Secretary - ~~Phang~~ Maina
John Kitama - C. Member
Lucy Rumbwa - C. Member
Wilson Wagoce - C. member
Antony Mugambi - C. member

Start with a prayer by Eunice at 09.30pm
previous minute was read.

proposed by Antony Mugambi
seconded by Wilson Wagoce
Signed by chairman

Agenda: I Way leave.
II Maintenance.

Agenda I - Chairman tell the Committee (the) how
he has done about the Term of way leave.

Thereafter the form must be attached with the minute (book) to show when members agreed on the ongoing project. These gazette on how the project was put on the the gazette. All members must sign the way leave. Committee (st) will meet soon to look for the minute when the proposal of requesting the LEAP to upgrade the project. Officials to meet soon to sort out the way leave to meet on Monday (st) 10th to look for the way leave.

- On 17th May ^{at 10:30pm} Committee will meet with the leaders and contractors at Lumba Coffee factory.

The gazette to be filled.

Closed with a pray by Lucy Dwanba at 6.10 pm

Signed by Secretary
Mwangi Maina - Mwangi

Annex 8: List of participants during public participation meeting

<u>Attendance</u>		11/1/2021	
ANGUYO-INI MEETING		18/00	
1	EMILICE WAMBUI KIMATHI	13538578	0728107
2	Stephen Irungu KIUU	22158525	074231
3	Peter Wingu KENN	7277447	07238751
4	Frank Mwangi	35479814	07438095
5	WESTON MAINAMJUGI	3615884	075719
6	Samuel Nyungu Mzee	0902555	0722443
7	John Kabui	9143455	07238725
8	Wilson Wafochi	11319035	07275044
9	JOHN KIMAA WAMBUI	10325113	07012855
10	RICHARD KAGUCHIA GICHOMI	2972222	07265501
11	PATRICK MWAT KAMUHTO	2973401	07240751
12	Rev. JACKSON A. MAKAU	0235374	07222267
13	Peter Kimani Ngunjiri	7228975	07247011
14	AMOS IRUNGU GATAHI	11074491	072076
15	FAITH WAMBUI	5454998	07024011
16	PETERSON WATTHAKA	9262347	0700367
17	Godfrey Ithimu	21355221	0710053
18	Rachael Wangari	20417137	0724911833
19	Douglas Mwangi	3191943	0724353
20	Mwangi Maina	10950791	0726561521
21	Patrick Gichuki Wanga	9669987	07291751
22	Mwangi Mburia		0729695
23	Peter Mwangi		
24	Lawrence Nyagah Wachira	11565358	07244662
25	Douglas MAINA NBEGWA	3507674	072624881
26	Charles Kamau	5615277	0710954289
27	Esther Wanjugu	12451489	07207054
28	Emice Wangui	3064818	079874301
29	L. Wathara Mwangi	8398028	07066861
30	JANE WANGONYI	0795807575	32350456
31	FLORENCE Wacama MURAGE	10594544	07230481
32	TOM WACAMA MURAGE	12720791	07119371

Attendance

NAMES	ID/NO	TEL
33 ESIHER WAMBURA GITHI	24528388	0728101041
34 Lucy MURITHI	7668658	07293344
35 PURITY WAMBUI		
36 Monica mugure	26886927	0728418118
37 THOMAS MWANGI	2973215	074672541
38 Nemben maina	10594282	0790171417
39 PLESO MWANGI	0710451790	
40 Joseph Ndegwa Mwai	—	—
41 AMOS ITUNE W	—	—
42 SAMUEL MWANGI W	—	—
43 MARY NYERID	—	—
44 Frashida Wambui	23469135	0726691068
45 GAKOMA MWANGI	07121483293	0712600641
46 PATRICK MUTATHI	6836575	0708232104
47 Gerald Ironger	—	—
48 Jackson M. Mwangi	—	0795863001
49 ELIJAH Nganga	25854299	0718959139
50 DICK MWANGI	22357661	0744117651
51 FRANCIS MWANGI	4591889	0722486356
52 GEOFFREY MWANGI	20591276	0712031110
53 David Gichau	11630706	0707317403
54 Francis Mwangi	3615083	0797128207
55 PETER NDEGWA	9552557	0726419414
60 KARANJA KIRAU	3616996	0721728265
61 CHARLES GREGG	6414800	0727441011
62 HELEN KIMANI	3481153	0718710673
63 FLORENCE WAIRIMU	11802731	0701903291
64 PETERSON MWANGI	21243234	
65 David GITHI	13885168	0712918672
66 JAMES MWANGI	25883122	0762097845
67 JOHN JAMBURA	21547009	0745516926

Attendance

	NAMES	ID/NO	TEL
69	Jeremia Gikwari Wanguri	29281592	0724823853
70	Mukah Muthani kibuchi	21678034	0724474745
71	Josphine Wangari Mwangi	4856843	0729692611
72	Lucy Wagitithi Njiraga	9856540	0715667986
73	Mary Wamuyu Mwangi	12775264	0706293523
74	Lucy Wanjiku Maini	24852389	0713447010
75	Beatrice Nakuuru Wathome	25571166	0710279541
76	GRACE WAMUYU MWANGI	12777331	072096258
77	Wanjiku Ngũgũ Njambura		
78	Josephine Njeri Waweru	34073642	0705014166
79	Jedidah Wambui Githuku		0758659551
80	Lydia Wambui Kamonde	1851795	0714375575
81	Agnes Muringa Njuki	10626311	0720815786
82	Esther Karimi Kariuki	36151668	0700601690
83	Beatrice Wanjiru	23084481	0702933897
84	Grace Wangui Mburu	10686037	0726538764
85	Gladys Wambui	-	-
86	Virginia Njeri	3496023	0701176666
87	Lydia Wanjiru	-	-
88	Mary Wanjiru	2210689	0712382275
89	Virginia Muthoni	12775751	0714874596
90	AGNES WANGARI	10595268	0721822956
91	Susana N. Gatimu	28117769	0710423565
92	Peter Mwangi Maina	27469211	0718413291
93	John Muthuri Maina	29500105	0700821876
94	Mary Njambi Muchoki	9670385	0710962177
95	JANE GICHERU	20722411	0723579210
96	LILIAN NDEGWA	34838745	0716527028
97	Judy Wangui	25315902	0714501857
98	Geoffrey Githumbi	9856539	0726513744
99	Rose Mary Wanjiru	9381542	0721100269
100			

Attendance

	NAMES	ID/NO	Tel
100	Wanjiku Muriuki	—	—
101	Alice W. Mahugu	—	0798608111
102	Peterson M. Gakungu	9856291	0725226182
103	Simon Mwangi Mburu	8514307	0715316423
104	John W. Mugo	14518353	0723603447
105	Julie MURAGURI	21035343	0722535274
106	Harold E. MUCHIRI	23793062	072779222
106	Festus Ngathi NABETI	13198502	0727622419
107	Mutua Muriuki	2021630	07952990618
108	Deshon KAIRU	22099861	0726240541
109	Wilson KARANGA	11129564	0718960278
110	JOSEPH Wainyaga	240114763	071251232
111	Glarence Wanyama	55558584	0727252606
112	ARLOS Wanyama	9263644	0720269817
113	OWENUS NJOROGE	10844299	0720064317
114	BONIFACE Muthara	21968776	
115	WACHTARI MURARE	2978987	0721884635
116	Njau Wambui		
117	Julius Kagiri Mwara	3350344	0727929481
118	Simon Gachungu	10525034	0725492877
119	Samuel Kamau	22085272	072447948

Annex 9: Public Consultation Filled Questionnaires

Annex 1: Public Participation Questionnaires

PUBLIC PARTICIPATION AND CONSULTATION QUESTIONNAIRE

PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT CAP 387, AND SUBSIDIARIES 2015 & 2019 REVISED REGULATIONS ON ENVIRONMENTAL IMPACTS ASSESSMENT AND AUDIT, REQUIRES PUBLIC PARTICIPATION AND CONSULTATION BEFORE COMMENCEMENT OF ANY DEVELOPMENT WITH POSSIBLE ENVIRONMENTAL AND SOCIAL IMPACTS (AS SCHEDULED IN THE ACT).

PROPOSED IS REHABILITATION AND UP-GRADING OF THE THIHA MICRO IRRIGATION IN THIHA-KIMONDO SUB-LOCATIONS IN MUKURWEINI SUB-COUNTY. PLEASE PROVIDE YOUR OPINION WITH REGARD TO ANY POSSIBLE NEGATIVE IMPACTS.

Name PATRICK MUTATI ID 6836575 TEL: 0708232104
The information will be treated with all the confidentiality and will only be used to assist Nema & World Bank in decision-making during review of the ESIA report and licencing of the Project.

A) Are there negative impacts (harmful) from the proposed project/s?

YES ☒ NO ☐ (please tick ☒ accordingly)

B) IF Yes kindly list them below:

- i) Risk of personal injury accident during working
- ii)
- iii)
- iv)

B) How can they be minimized/mitigated?

- 1. By wearing protective gears all times when in work
- 2.
- 3.
- 4.

C) RESPONDENT RECOMMENDATIONS:

- 1. In your opinion, do you think the project should be allowed to continue and be licenced by NEMA? YES ☒ NO ☐ (please ☒ accordingly)

2. If NO, Please indicate Your Major Reasons and the Wayforward/Alternatives below;

- (i) Project will boost agriculture
- (ii)
- (iii)
- (iv)

Thank You for Participation

Annex 1: Public Participation Questionnaires

PUBLIC PARTICIPATION AND CONSULTATION QUESTIONNAIRE

PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT CAP 387, AND SUBSIDIARIES 2015 & 2019 REVISED REGULATIONS ON ENVIRONMENTAL IMPACTS ASSESSMENT AND AUDIT, REQUIRES PUBLIC PARTICIPATION AND CONSULTATION BEFORE COMMENCEMENT OF ANY DEVELOPMENT WITH POSSIBLE ENVIRONMENTAL AND SOCIAL IMPACTS (AS SCHEDULED IN THE ACT).

PROPOSED IS REHABILITATION AND UP-GRADING OF THE THIHA MICRO IRRIGATION IN THIHA-KIMONDO SUB-LOCATIONS IN MUKURWEINI SUB-COUNTY. PLEASE PROVIDE YOUR OPINION WITH REGARD TO ANY POSSIBLE NEGATIVE IMPACTS.

Name CHARLES OHTA ID 604806 TEL: 0729 441011
The information will be treated with all the confidentiality and will only be used to assist Nema & World Bank in decision-making during review of the ESIA report and licencing of the Project.

A) Are there negative impacts (harmful) from the proposed project/s?

YES ☒ NO ☐ (please tick ☒ accordingly)

B) IF Yes kindly list them below:

- i) Water generation especially around
- ii) Sanitary channels
- iii) _____
- iv) _____

B) How can they be minimized/mitigated?

- 1. Proper management e.g use of protective gears
- 2. _____
- 3. _____
- 4. _____

C) RESPONDENT RECOMMENDATIONS:

1. In your opinion, do you think the project should be allowed to continue and be licenced by NEMA? YES ☒ NO ☐ (please ☒ accordingly)

2. If NO, Please Indicate Your Major Reasons and the Wayforward/Alternatives below:

- (i) N/A - Project will provide water for Irrigation
- (ii) production of cash crops and
- (iii) employment of youth and women
- (iv) _____

Thank You for Participation

Annex 1: Public Participation Questionnaires

PUBLIC PARTICIPATION AND CONSULTATION QUESTIONNAIRE

PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT CAP 387, AND SUBSIDIARIES 2015 & 2019 REVISED REGULATIONS ON ENVIRONMENTAL IMPACTS ASSESSMENT AND AUDIT, REQUIRES PUBLIC PARTICIPATION AND CONSULTATION BEFORE COMMENCEMENT OF ANY DEVELOPMENT WITH POSSIBLE ENVIRONMENTAL AND SOCIAL IMPACTS (AS SCHEDULED IN THE ACT).

PROPOSED IS REHABILITATION AND UP-GRADING OF THE THIHA MICRO IRRIGATION IN THIHA-KIMONDO SUB-LOCATIONS IN MUKURWEINI SUB-COUNTY. PLEASE PROVIDE YOUR OPINION WITH REGARD TO ANY POSSIBLE NEGATIVE IMPACTS.

Name MUKHA NJEMBI MURUGU ID _____ TEL: 0716489748
The information will be treated with all the confidentiality and will only be used to assist Nema & World Bank in decision-making during review of the ESIA report and licencing of the Project.

A) Are there negative impacts (harmful) from the proposed project/s?

YES ☒ NO ☐ (please tick ☒ accordingly)

B) IF Yes kindly list them below:

- i) It can lead to change in soil pH
ii) _____
iii) _____
iv) _____

B) How can they be minimized/mitigated?

1. By using of appropriate fertilizers
2. _____
3. _____
4. _____

C) RESPONDENT RECOMMENDATIONS:

1. In your opinion, do you think the project should be allowed to continue and be licenced by NEMA? YES ☒ NO ☐ (please ☒ accordingly)

2. If NO, Please Indicate Your Major Reasons and the Wayforward/Alternatives below;

- (i) N/A
(ii) _____
(iii) _____
(iv) _____

Thank You for Participation

Annex 1: Public Participation Questionnaires

PUBLIC PARTICIPATION AND CONSULTATION QUESTIONNAIRE

PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT CAP 387, AND SUBSIDIARIES 2015 & 2019 REVISED REGULATIONS ON ENVIRONMENTAL IMPACTS ASSESSMENT AND AUDIT, REQUIRES PUBLIC PARTICIPATION AND CONSULTATION BEFORE COMMENCEMENT OF ANY DEVELOPMENT WITH POSSIBLE ENVIRONMENTAL AND SOCIAL IMPACTS (AS SCHEDULED IN THE ACT).

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Name GAKONYA NIWANGI ID 21483293 TEL: 07 12 600641
The information will be treated with all the confidentiality and will only be used to assist Nema & World Bank in decision-making during review of the ESIA report and licencing of the Project.

A) Are there negative impacts (harmful) from the proposed project/s?

YES ☒ NO ☐ (please tick ☒ accordingly)

B) IF Yes kindly list them below:

- i) It can lead to soil erosion
- ii) _____
- iii) _____
- iv) _____

B) How can they be minimized/mitigated?

1. By planting of enough plants and crops around
2. _____
3. _____
4. _____

C) RESPONDENT RECOMMENDATIONS:

1. In your opinion, do you think the project should be allowed to continue and be licenced by NEMA? YES ☒ NO ☐ (please ☒ accordingly)

2. If NO, Please Indicate Your Major Reasons and the Wayforward/Alternatives below:

- (i) N/A
- (ii) _____
- (iii) _____
- (iv) _____

Thank You for Participation

Annex 1: Public Participation Questionnaires

PUBLIC PARTICIPATION AND CONSULTATION QUESTIONNAIRE

PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT CAP 387, AND SUBSIDIARIES 2015 & 2019 REVISED REGULATIONS ON ENVIRONMENTAL IMPACTS ASSESSMENT AND AUDIT, REQUIRES PUBLIC PARTICIPATION AND CONSULTATION BEFORE COMMENCEMENT OF ANY DEVELOPMENT WITH POSSIBLE ENVIRONMENTAL AND SOCIAL IMPACTS (AS SCHEDULED IN THE ACT).

PROPOSED IS REHABILITATION AND UP-GRADING OF THE THIHA MICRO IRRIGATION IN THIHA-KIMONDO SUB-LOCATIONS IN MUKURWEINI SUB-COUNTY. PLEASE PROVIDE YOUR OPINION WITH REGARD TO ANY POSSIBLE NEGATIVE IMPACTS.

Name RICHARD KAGUCHA ID 2942222 TEL: 09266501
The information will be treated with all the confidentiality and will only be used to assist Nema & World Bank in decision-making during review of the ESIA report and licencing of the Project.

A) Are there negative impacts (harmful) from the proposed project/s?

YES _____ NO ✓ (please tick ✓ accordingly)

B) IF Yes kindly list them below:

- i)
- ii) None
- iii)
- iv)

B) How can they be minimized/mitigated?

- 1. None
- 2.
- 3.
- 4.

C) RESPONDENT RECOMMENDATIONS:

1. In your opinion, do you think the project should be allowed to continue and be licenced by NEMA? YES ✓ NO _____ (please ✓ accordingly)

2. If NO, Please Indicate Your Major Reasons and the Wayforward/Alternatives below:

- (i) None
- (ii)
- (iii)
- (iv)

Thank You for Participation

Annex 1: Public Participation Questionnaires

PUBLIC PARTICIPATION AND CONSULTATION QUESTIONNAIRE

PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT CAP 387, AND SUBSIDIARIES 2015 & 2019 REVISED REGULATIONS ON ENVIRONMENTAL IMPACTS ASSESSMENT AND AUDIT, REQUIRES PUBLIC PARTICIPATION AND CONSULTATION BEFORE COMMENCEMENT OF ANY DEVELOPMENT WITH POSSIBLE ENVIRONMENTAL AND SOCIAL IMPACTS (AS SCHEDULED IN THE ACT).

PROPOSED IS REHABILITATION AND UP-GRADING OF THE THIHA MICRO IRRIGATION IN THIHA-KIMONDO SUB-LOCATIONS IN MUKURWEINI SUB-COUNTY. PLEASE PROVIDE YOUR OPINION WITH REGARD TO ANY POSSIBLE NEGATIVE IMPACTS.

Name Rachael Wanjiru ID 20417137 TEL 0724911833
The information will be treated with all the confidentiality and will only be used to assist Nema & World Bank in decision-making during review of the ESIA report and licencing of the Project.

A) Are there negative impacts (harmful) from the proposed project/s?

YES ☒ NO ☐ (please tick ☒ accordingly)

B) IF Yes kindly list them below:

- i) Introduction of irrigation water fees
- ii) Conflict on water access and use
- iii) _____
- iv) _____

B) How can they be minimized/mitigated?

1. Abolishing of water fees
2. Proper governance
3. _____
4. _____

C) RESPONDENT RECOMMENDATIONS:

1. In your opinion, do you think the project should be allowed to continue and be licenced by NEMA? YES ☒ NO ☐ (please ☒ accordingly)

2. If NO, Please Indicate Your Major Reasons and the Wayforward/Alternatives below;

- (i) N/A - The project is important for:-
- (ii) providing water for irrigation
- (iii) Generation of income and
- (iv) Employment of youth and women

Thank You for Participation

HYDROLOGICAL ASSESSMENT REPORT

THIHA MICRO - IRRIGATION SELF HELP GROUP.

P.O. BOX 164 - 10103,

MUKURWE INI.

LOCALITY:

MUTUNDU SUB LOCATION, RUTUNE LOCATION, MUKURWE INI

SOUTH DIVISION MUKURWE INI SUB COUNTY,

IN

NYERI COUNTY.

INVESTIGATED SITES CO ORDINATES.

S 00.59240, E, 37.13273/ S 0°35' 32.8", E 37° 07' 57.8" Alt. 4789ft, Alt 1454m asl.

MAP SHEET: MURANG'A 135/1

REPORT PREPARED BY:

STEPHEN OKOTH OWUOR - WD/WRP/208

LIFE WATERS DRILLING LIMITED.

(Consulting hydro geologists, hydrologists and EIA/EA Experts)

P. O. Box 10670-30100,

ELDORET.

Cell-phone: 0734770000


LWD/SW/019/006/20

4TH DECEMBER 2020



Annex 11: Copy of Practicing Licence of the Project Hydrologist

REPUBLIC OF KENYA



(THE WATER ACT) Licence No. **WD/WP/208**

LICENCE

QUALIFIED WATER RESOURCE PROFESSIONAL
(HYDROGEOLOGY & HYDROLOGY) Rule 134

*Mr. Steven O. Owuor,
P.O. Box 33350-00600n Nairobi.*

Dear Sir,
I have the honour to inform you that the Ministry of Water and Sanitation has given you a licence to operate as a Qualified Water Resource Professional in the following category.

DETAILS OF QUALIFIED WATER RESOURCE PROFESSIONAL:

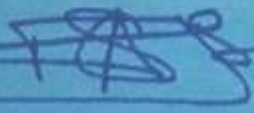
Name: **STEVEN OKOTH OWUOR**
Town: **Nairobi**
Post Office Box: **33350**
Postal Code: **00600**
Pin Number: **A004376018L**
Telephone Contact
(Land Line): ********
Telephone Contact
(Mobile): **0711384748, 0737541260**
Email Contact: **okothanumo@yahoo.com**

DETAILS OF LICENCE: HYDROGEOLOGY AND HYDROLOGY

CONDITIONS OF LICENCE:

- This licence is issued subject to annual gazettelement/renewal until further notice.
- Licence replaces licence No. WD/WRP/208 dated 27/06/2014 until further notice.

Yours Faithfully,

Signature: 

Name: **ENG. S.A.O. ALIMA**

Position: **Ag. DIRECTOR WATER SEWERAGE & SANITATION DEVELOPMENT**
Chairman Ministerial Technical Advisory Committee

Date of Issue: **6th December, 2018**

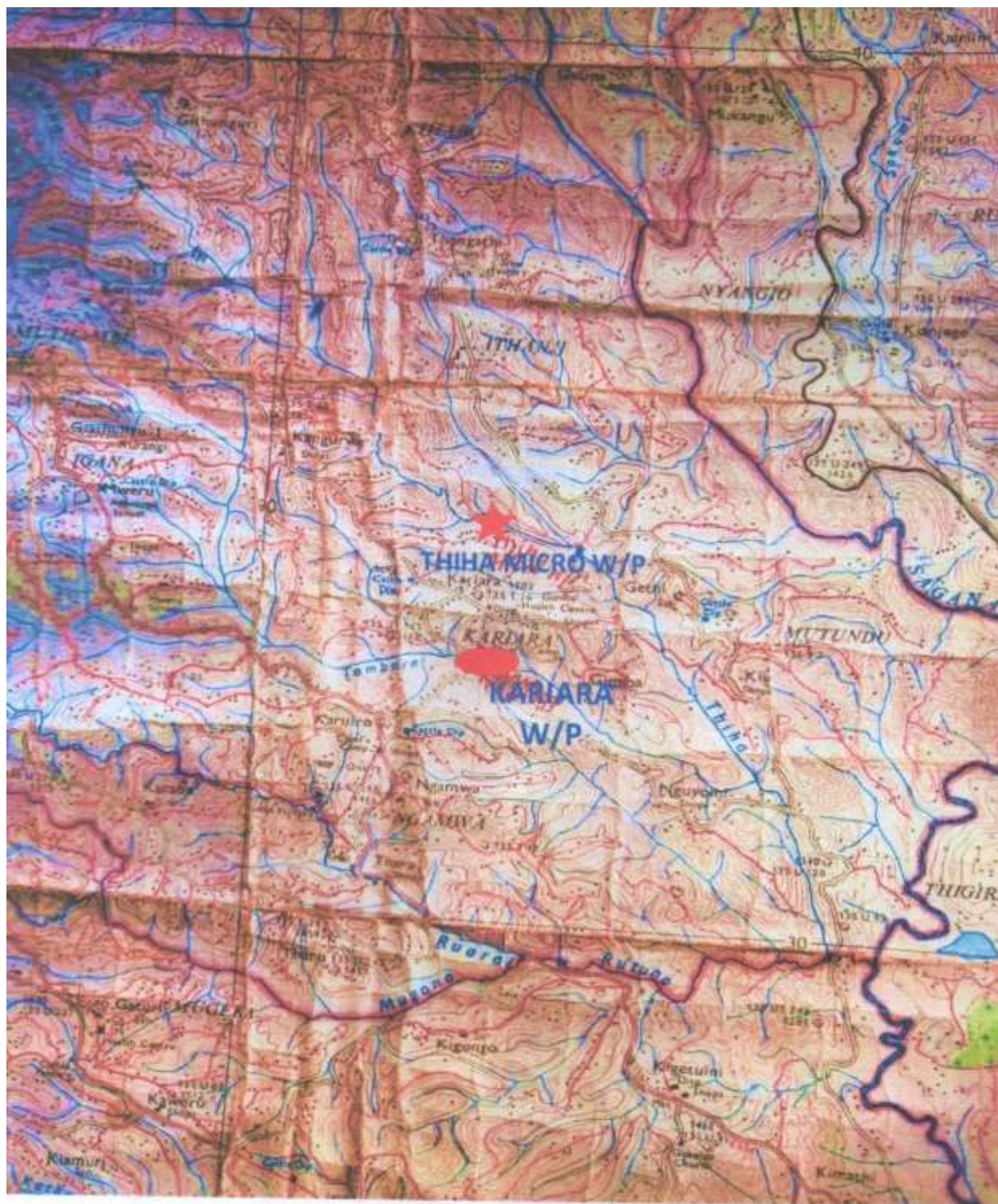
**This licence is issued without any erasures whatsoever.* (MTAC-F-12/2018)

**MINISTERIAL TECHNICAL
ADVISORY COMMITTEE**

6 DEC 2018

WATER - 00160,
MINISTRY
OF WATER
AND SANITATION

Annex 12: Topographical Map of the Project Area, map sheet no.: Murang'a 135/1



Annex 13: Practicing License for the Lead Expert

FORM 7

(r.15(2))



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

License No : NEMA/EIA/ERPL/12999

Application Reference No: NEMA/EIA/EL/17181

M/S **CHARLES KIRIMI MUTHINJA**
(individual or firm) of address

P.O. Box 1552-10100, NYERI

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **1622**

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

Issued Date: 7/16/2020

Expiry Date: 12/31/2020


Signature.....

(Seal)
Director General
The National Environment Management
Authority



Annex 14: Lead Expert Certificate of membership to EIK

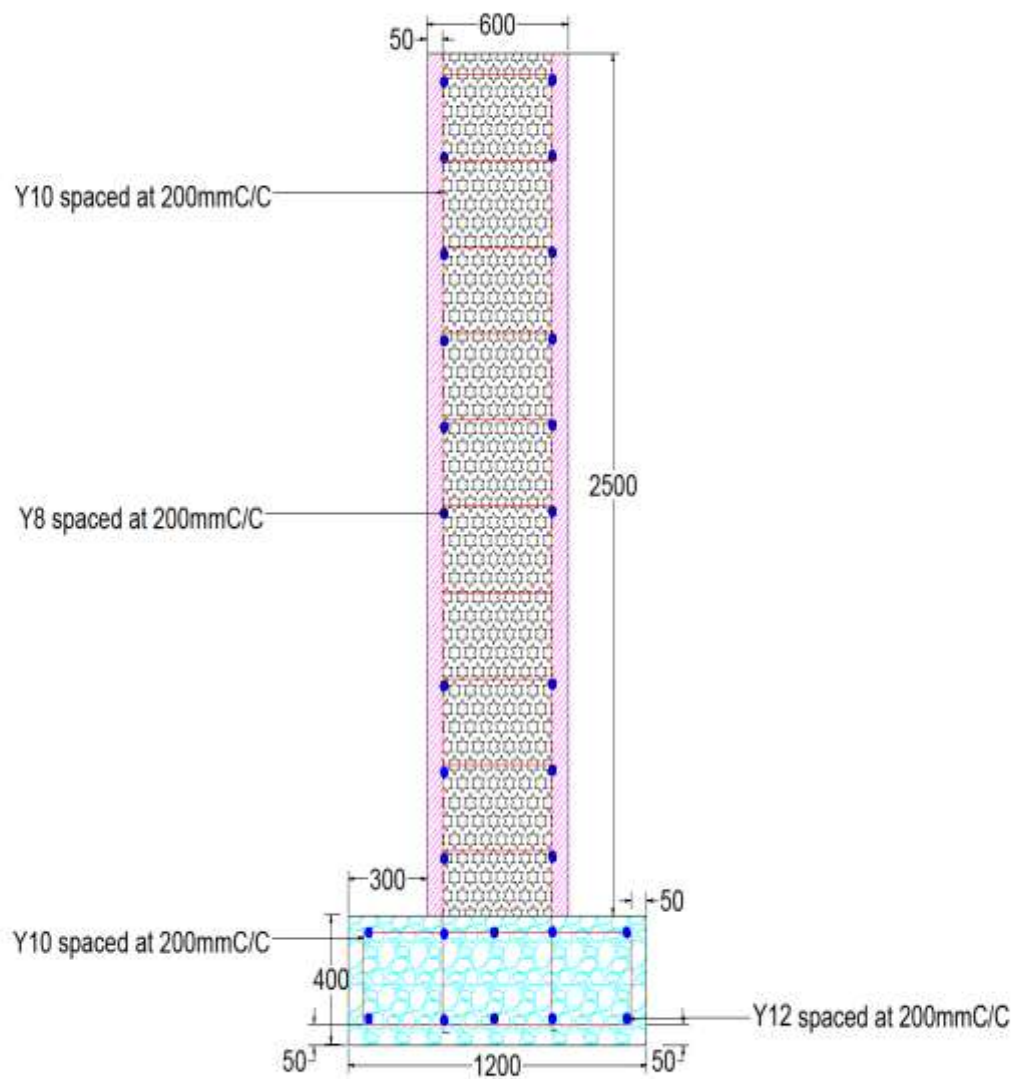


Annex 15: List of Stakeholders Consulted

Name of Organization	Stakeholders Consulted	No Consulted
Thiha Micro Irrigation Project Help Group	Group Official	3(2M, 1F)
	Members of the group	76(45M, 31F)
Thiha Micro Irrigation Project Management Committee	Committee members	11(5M,6F)
County Government of Nyeri	Officers from the department of water, department of agriculture and irrigation	4(2M, 2F)
Provincial Adm.	Area chief and Assistant Chief	4(M,F)
Vulnerable and Marginalized Groups	Youths	2(1M,1F)
	Women	2
	Differently abled persons	2(1M,1F)

Annex 16: Designs and Drawings

Annex 16.1 Reinforced support Pillars for the pipes



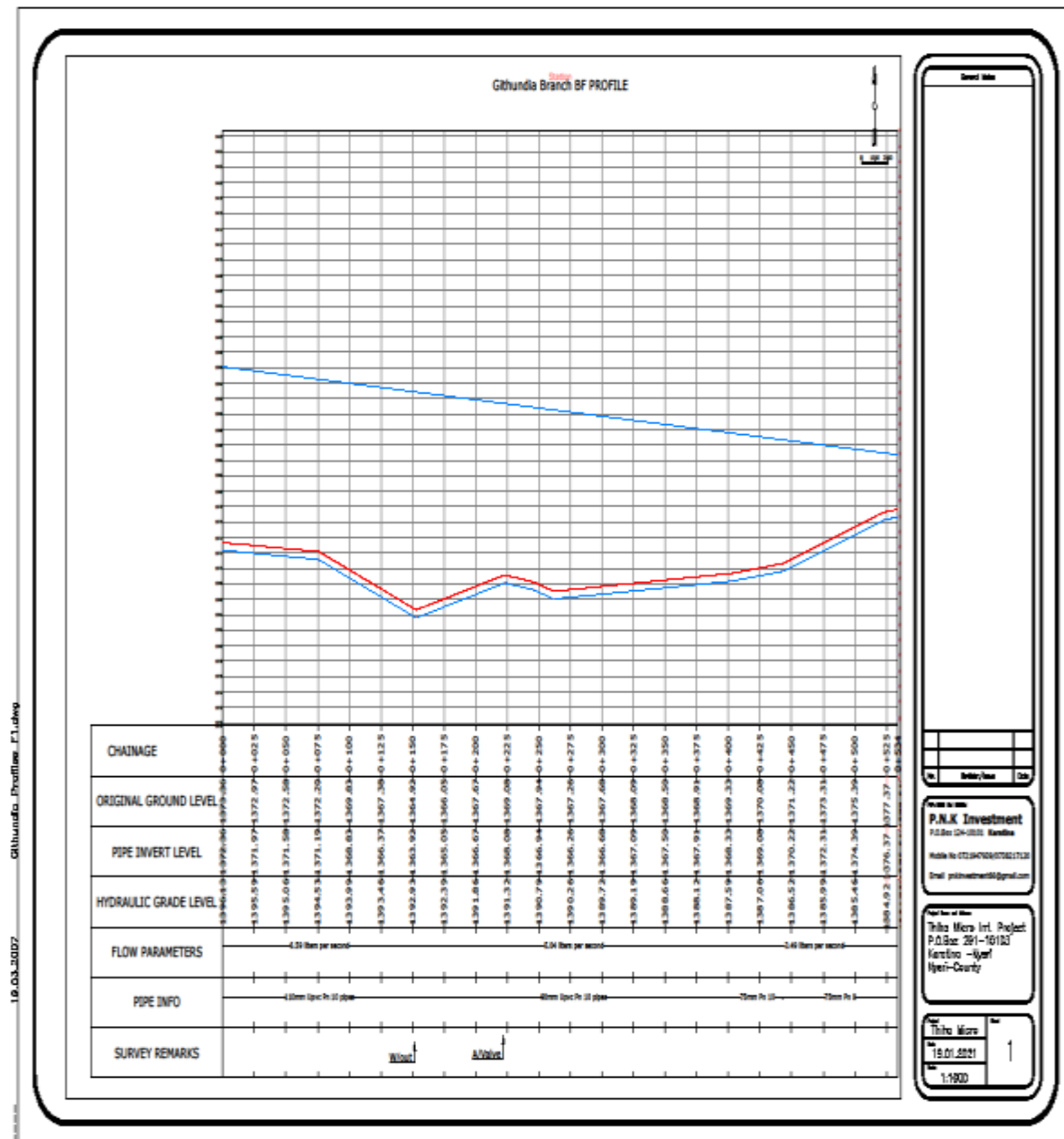
19.03.2007 Karlova Main branch to Hluboká, chag



10.03.2007	Future Primary Profiled
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Annex 16.4 Githundia Branch

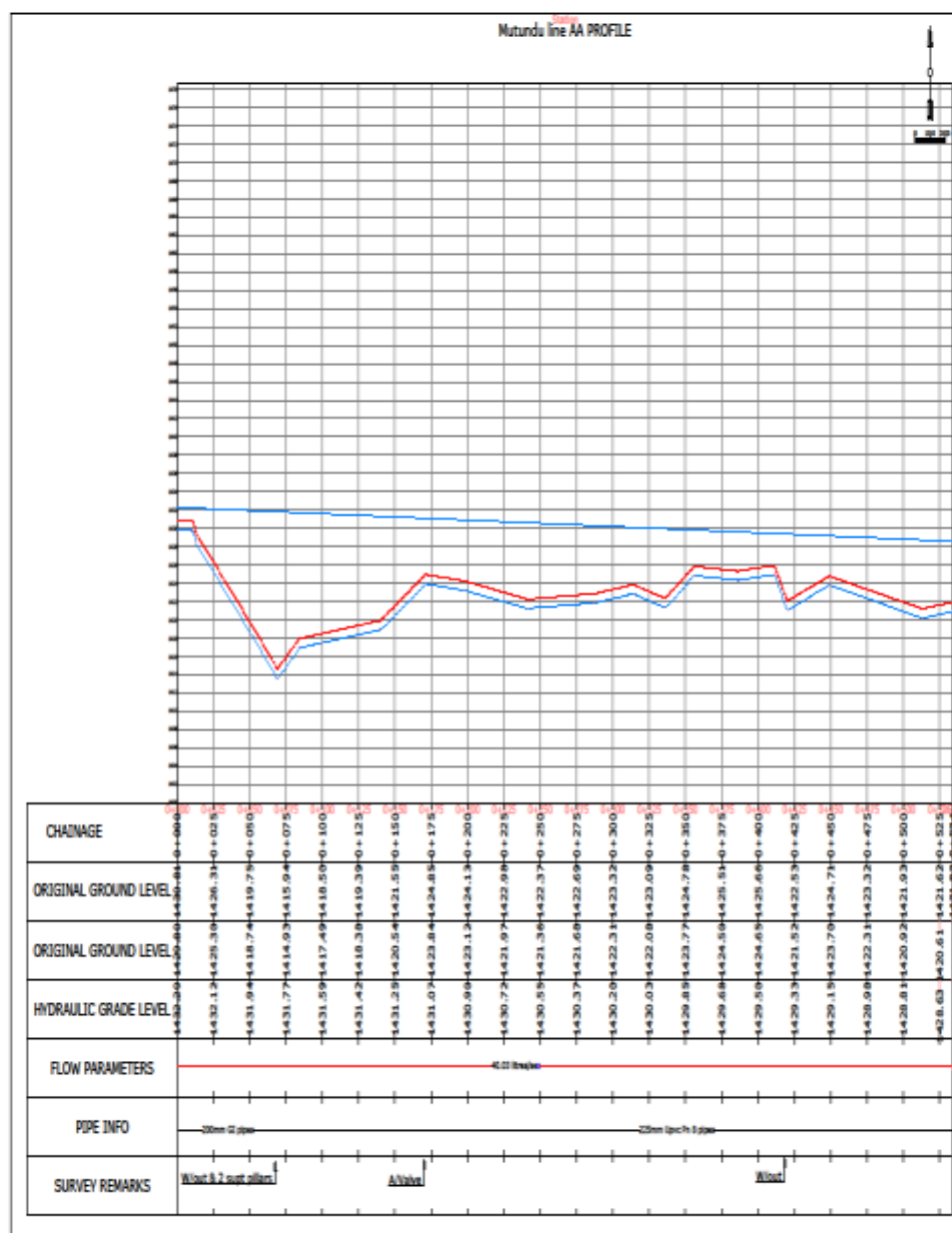


Annex 16.5: Mutundu Mainline B

Mutundu_line_AA_profile.dwg

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Sheet Size

Project Name

Client Name

Project No

Scale

Drawn By

Checked By

Approved By

Date

19.03.2021

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