



ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT SUMMARY PROJECT REPORT FOR THE PROPOSED REHABILITATION OF KABAYI IRRIGATION SCHEME & INFRASTRUCTURE WORKS IN WEST KISUMU WARD, KISUMU WEST SUB- COUNTY , KISUMU COUNTY



Latitude -0.036647° , Longitude 34.662228° .

PROJECT PROPONENT:

COUNTY GOVERNMENT OF KISUMU

(Department of Agriculture, Irrigation, Livestock & Fisheries)

KENYA CLIMATE SMART AGRICULTURE PROJECT (KCSAP)

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This Environmental & Social Impact Assessment Project Report (ESIA) for the proposed **rehabilitation of Kabayi Irrigation Scheme in Kisumu West Ward; Kisumu West Sub County** by **The County Government of Kisumu** under the **Kenya Climate Smart Agriculture Project (KCSAP)** has been prepared in accordance with the Environmental Management and Coordination (Amendment) Act (EMCA) 2015 and the Environmental Impact Assessment and Audit regulations 2003 for submission to the National Environment Management Authority (NEMA).

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LIST OF ACRONYMS

ARVs	Anti-Retroviral
CESSCO	County Environment and Social Safeguard Compliance Officer
dBA	Decibel (Averaged)
DOHS	Directorate of Occupational Health and Safety Services
DOSHS	Directorate of Occupational Safety and Health Services
EHS	Environmental Health and Safety
EMCA	Environmental Management Coordination Act
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental Social Management Plan
ESSC	Environment and Social Safeguard Committee
FGD	Focused Group Discussion
GBV/SH	Gender Based Violence / Sexual Harassment
GIIP	Good International Industry Practice
GRM	Grievance Redress Mechanism
HIV/AIDS	Human Immunodeficiency Virus Infection and Acquired
ICID	International Commission for Irrigation and Drainage
IPM	Integrated Pest Management
IWRUA	Irrigation Water Resource Users Association
KCSAP	Kenya Climate Smart Agriculture Project
KEPHIS	Kenya Plant Health Inspectorate services
MCA	Member of County Assembly
MoALF&C	Ministry of Agriculture, Livestock, Fisheries and Cooperatives
MOH	Ministry of Health
MSDSs	Material Safety Data Sheets
NEMA	National Environment Management Authority
NIB	National Irrigation Board
OHS	Occupational Health and Safety
OP/BP	Operational Policy/ Bank Policy
PAPs	Potentially Affected Persons
PCPB	Pest Control Products Board
PIU	Project Implementing Unit
PPE	Personal Protective Equipment
PWD	People with Disability
SPR	Summary Project Report
STIs	Sexually Transmitted Infections
VCT	Voluntary Counselling and Testing
WHO	World Health Organization
WRA	Water Resources Authority

EXECUTIVE SUMMARY

The proponent, COUNTY GOVERNMENT OF KISUMU through Kenya Climate Smart Agriculture Project (KCSAP)- Project Coordinating Unit(Kisumu), and Kabayi Irrigation Water User Association proposes to rehabilitate Kabayi Irrigation Scheme in West Kisumu Ward; Kisumu West Sub – County. The project is funded by WORLD BANK and is meant to address the water scarcity crisis for irrigation in Kabayi irrigation scheme; increase agricultural productivity and enhance resilience to climate change risk. The Project Development Objective (PDO) is to increase agricultural productivity, build resilience to climate change risk and reduce of GHG emissions in the long-term. It is estimated that the project will cost **Kshs. 15,480,000.00 (fifteen million, four hundred eighty thousand Kenya shillings Only)**. Justification for conducting ESIA: The County Environment and Social Safeguards (ESS) team administered the ESS screening checklist and found out that the project is listed under the low risk project (k) *small scale rehabilitation, maintenance and modernization of projects* as per the Legal Notice 31 of April 2019 (Environment Impact Assessment/ Environment Audit (EIA/EA) regulations 2003, pursuant to the EMCA (Amendment) 2015 and 2019.

Methodology

To meet the objectives of the study, the Team of Experts adopted systematic, integrated, participatory and collaborative approaches. The team gathered information through: reconnaissance visit, baseline data Collection / Field Investigations, Document Reviews, Focus Group Discussions and Key Informant Interviews. Further consultations were held with local administrators (Chiefs and their Assistants), community leaders among others.

Legal Framework

This SPR was prepared taking into account all relevant policies, regulations, laws, World Bank Operational Policies, and World Bank Group Environmental, Health, and Safety Guidelines for Annual Crop Production and Good International Industry Practice (GIIP) so as to guide the operation of various activities that are carried out on the environment. The key national legal regime governing this project is the Environmental Management and Coordination (Amendment) Act, (EMCA) 2015 and the Environment (Impact Assessment and Audit) Regulations, 2019.

The project is associated with potential positive and negative impacts during the construction and operation phases with the positive impacts outweighing the negative impacts as highlighted in the paragraphs below:

Positive Impacts

The anticipated key positive impacts include: increase area under crop production, increase water storage, improve farmers' income and livelihood, reduce water velocity as well as decrease soil degradation, control of floods and cushion famers from crop damage / loss during drought.

Negative Impacts

The few anticipated negative impacts include: noise pollution, dust emission, increases cases of occupational hazards, interference with habitats (loss of vegetation cover) for both flora and fauna,

potential for soil erosion, pollution of river Kabayi, decadence of social norms spread of STI/ HIV/AIDS, Unhygienic condition within the project area, (Spread of COVID 19, cases of child labour and school drop outs, labour influx water use conflicts, increase in waterborne / related diseases and unsafe produce for human consumption.

Proposed mitigation

Farmers will re-establish vegetation cover (habitats) in the disturbed areas by: rehabilitating all sites that are being used for construction activities and installation of the soil erosion control measures. Undertake community awareness to ensure that women and minority group community members are provided equal opportunities to meaningfully participate in decision-making processes. Sensitize workers, farmers and the surrounding communities on awareness of the Grievance Redress Mechanism (GRM) procedures to resolve conflict, appropriate use of Personal Protective Equipment (PPEs), COVID 19 protocols as well as HIV/AIDS and STIs preventive measures. Ensure that project vehicles observe traffic safety signs within and beyond the project site.

Environmental and Social Management and Monitoring Plan (ESMMP)

The proposed rehabilitation of Kabayi Irrigation Scheme ESMP addresses concerns that are likely to arise from the project activities and recommends way forward to control and or mitigate against the potential impacts throughout the project life cycle at a cost of Two Hundred Seventy Thousand (270,000.00) Kenya Shillings.

Conclusion and Recommendations

Based on the findings, it is evident that construction and operation of the proposed Kabayi Irrigation Scheme will increase agricultural productivity, reduce greenhouse emission and build community resilience to climate. The identified adverse potential impacts will be mitigated as recommended in the environmental social and monitoring plan.

1 INTRODUCTION

1.1 Background

Kenya Climate-Smart Agriculture Project (KCSAP) is one of the projects in the agricultural and natural resources sector that is addressing the climate change impacts in Kenya. The Project Development Objective (PDO) is to increase agricultural productivity, build resilience and reduction of GHG emissions in the long-term.

KCSAP aims at increasing agricultural productivity and building resilience to climate change risks in the targeted small holder farming and pastoral communities in Kenya, and in the event of an eligible crisis or emergency, to provide immediate and effective response. This will be achieved through implementation of KCSAP five components:

- Up-scaling Climate-Smart Agricultural Practices
- Strengthening Climate-Smart Agricultural Research and Seed Systems
- Supporting Agro-weather, Market, Climate and Advisory Services
- Project Coordination and Management and
- Contingency Emergency Response.

Kabayi Small Scale Irrigation Scheme project is located in West Kisumu Ward; Kisumu West sub-county. The project's key components include intake construction, laying of conveyance pipes, spring protection and hydrants construction. The Irrigation Scheme has a potential of 340 acres against a developed area under crop of 190 acres.

1.2 Proposal Statements- Intent of the project

The County Government of Kisumu, in partnership with World Bank, under the program dubbed 'Kenya Climate Smart Agriculture project' (KCSAP) intends to improve agricultural productivity and enhance the community's resilience to climate change risk. This project will entail rehabilitation of an irrigation scheme, which will see the current acreage under irrigation increase, diversity of crops grown increase, and year-round farming. Sustained agricultural growth is critical to uplift the living standards of the people as well as generating rapid economic growth. Through this project therefore, it is expected that food security in the county and beyond will improve, there will be higher incomes to farmers and the government, employment to a larger population especially in the project area and poverty alleviation among others.

The main objective of this ESIA was to establish the baseline conditions of the proposed project sites evaluate the existing and the anticipated impacts and propose measures to enhance the positive impacts and measures to reduce the effects of the negative impacts.

1.3 Methodology

The methodology of the process which culminated to the assessment and the subsequent ESIA project report included the following: -

- **Reconnaissance survey** of the site; where the experts visited the site to know the location.
- **Screening:** This is the initial phase of any ESIA process. It involves the determination of whether or not an ESIA study is required for a particular development activity. Determination in the proposed project depended on the following aspects but not limited to:
 - The sensitivity of the area likely to be affected;
 - Public health and safety;
 - The possibility of uncertain, unique or unknown risks;
 - The possibility of having individually insignificant but cumulatively significant impacts;
 - Whether the proposed activity affects protected areas, endangered or threatened species and habitats;

Desk top review: The consultancy team reviewed all the relevant available documents on project activities and components from the client.

Field Data Collection / Site Investigation: The consultancy team conducted field visits to the proposed project site to obtain further data and consult with the stakeholders. The consultancy team established the nature of the surroundings including: existing infrastructure, economic and social set up of the local communities whose daily activities will be and/or likely to be affected by the implementation of the proposed irrigation project.

Stakeholder Consultation: The consultancy team with support of the Community Leaders and KCSAP CPCU organized and convened stakeholder consultation meetings for the stakeholders. The consultancy team used the local administration leaders (local chiefs and their assistants), water resource user's association, youth leaders and village elder to reach the communities. Stakeholders consulted were informed on the proposed project and asked to raise their concerns on the proposed project (See [Appendix IV: Stakeholder Consultation List](#)).

1.4 Justification for the ESIA

The County Environment and Social Safeguards (ESS) team administered the ESS screening checklist and found out that the project is listed under the “low risk” project (k) small scale rehabilitation, maintenance and modernization of projects as per the Legal Notice 31 of April 2019 (Environment Impact Assessment/ Environment Audit (EIA/EA) regulations 2003, pursuant to the EMCA (Amendment) 2015 and 2019. It is against this background that the proponent, **County Government of Kisumu** (see Appendix XI: KRA PIN Certificate)- **Kenya Climate Smart Agriculture Project (KCSAP)** engaged expertise of **Ecofix Consultancy Limited** a firm of registered ESIA/EA experts (see Appendix IX: NEMA License) to carry out Environmental and Social Impact Assessment and prepare this SPR report. This SPR has been prepared in a manner consistent with policies, laws and regulations of the Government of Kenya specifically Environmental Impact Assessment and Audit Regulations 2019 and World Bank Environment and Social Safeguard Operational Policies and Good International Industry Practices (GIIP).

1.6 Scope of the ESIA

Ecofix Consultancy Limited undertook the Environmental and Social Impact Assessment and prepared SPR report covering but not limited to the following areas: in-depth review of laws and regulations of the Government of Kenya, World Bank Environment and Social Operational Policies and Good International Industry Practices (GIIP) Detailed description of project activities, description of the baseline socio-economic and bio-physical environment, analysis of potential positive and negative E&S impacts. Recommended the appropriate mitigation and support measures for the negative impacts, and measures to enhance positive impacts. Carried out an assessment of the potential Environmental & Social impacts of the proposed project and developed a comprehensive environmental and social plan for the construction, operation and decommissioning phases. Developed an action plan that ensures the health and safety of the workers, farmers’ and neighboring communities in the project cycle. And assessed the environmental costs and benefits of the proposed project to the local and national economy and prepared an Environmental and Social Management Plan (ESMP) with a comprehensive mitigation measures with an estimated budget of Eight Hundred Seventy Thousand (870.000.00) Kenya Shillings.

1.8 Organization of report chapters

This report is organized in eleven chapters. Chapter 1 gives an introduction and background of the project; Chapter 2 deals with the nature of the project, Chapter 3: gives the locational detail of the project; Chapter 4: Public Participation and Stakeholders' Consultation. Chapter 5: I Potential Impacts and Mitigation Measures. An Environment and Social Management and Monitoring Plan is captured on Chapter 6, while Chapter 7 provides conclusions and recommendations of the project.

2 NATURE OF THE PROJECT

2.1 Introduction

The project entails the construction of the barrier across the River Kabayi to raise water level for abstraction into the pipeline as per design drawings. This shall be followed by the construction of BRC reinforced concrete Sump of dimensions 1.2m x 1,2m and 1.5m high at the intake point to encase water. This will be conveyed through pipeline to various identified water hydrant points within the proposed Block 1 to Block 6 (see Figure 2.1. and 2.1 the design of the Water Hydrant Points).

Other support irrigation infrastructures include:

- Excavation of trench 3100m long, 0.6m deep and 0.5 m wide to receive pipes and backfilling thereafter,
- Excavation of trench 1000m long, 0.6m deep and 0.5 m wide to receive pipes and backfilling thereafter
- Excavation of trench 100m long, 2m deep and 0.5 m wide to receive pipes and backfilling thereafter, and
- Rehabilitation of the disturbed areas by constructing spring and river bank protection measures as shall be directed by County Engineers during the end of construction phase. Refer to figure 2.1 and 2.2 attached as appendix.

3 LOCATION OF THE PROJECT

3.1 Introduction

The proposed project entails rehabilitation of Kabayi Irrigation Scheme and Infrastructure Works in West Kisumu Ward, Kisumu West Sub-county with the aim of assisting the local farmers improve agricultural productivity and enhance their resilience to climate change risk. It is intended to benefit 5,000 farmers put more land (150 acres) into production as well as plant maize, kales (Sukuma wiki), Okra, local vegetables (Black night shade, Spider weed, Amaranths), among others through supplemental irrigation during the dry season. The irrigation project is targeting about 340 acres.

3.2 Project Location

The project will be located in Sinyolo, Sianda and Rabwoli Villages in Kisumu West, next to Daraja Mbili Market Centre, approximately 1.8Km from Kisumu – Busia highway at Daraja Mbili Road Junction. The GPS coordinates of the site is Latitude **-0.036647°**, Longitude **34.662228°**. The project sources its irrigation water from River Kabayi. The Water Intake at River Kabayi Irrigation Scheme is located at **Latitude -0.036647°**, **Longitude 34.662228°** at an elevation of 1,362 meter above sea level; one of the highest point within the irrigation scheme (see Figure 3-1).

The piece(s) of land where the project will be implemented is owned by the community members who voluntarily consented (for the implementation of the project on the said piece of land) (*list of the community members with their signatures is annexed to this report as Appendix IV*). In addition, the National Land Commission undertook land ownership due diligence by undertaking community consultations on 5th July to 10th July 2021 (see Appendix II) and it officially approved the proposed project to be on community land (see Appendix I: Letter from National Land Commission).

The site was considered for the project due to the request from farmers, availability of reliable river from where water can be drawn; the existing land use in the area is predominantly irrigated agriculture.



Figure 3-1: Location of the project location

Source: Google (accessed on 16.01.2022)

The community's contribution to the project include: land for irrigation, excavation of canal, provision of locally available materials, moving of, materials to the site, unskilled labor, security and management of the project among others.

4 PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATIONS

4.1 Introduction

This section highlights the outcome from public participation and consultation exercises undertaken within the project influence area on 13th January, 2022 (See the annexed Community Consultative Minutes on Appendix III). Public participation is geared towards informed decision making by all stakeholders involved in a project thereby promoting sustainability. The Legal Notice No. 101, the Environmental (Impact Assessment and Audit) Regulations, 2003 (Amended 2019) requires that the views of persons who may be affected by the project be sought during the process of conducting an ESIA. This is achieved through a number of mechanisms, including the administering of questionnaires as well as holding public hearings/workshops. Public participation is a key component of an ESIA and is used to integrate citizens into the environmental decision-making process. Traditional decision-making approaches such as closed-door discussions between politicians and experts are no longer appropriate (Barrington et al., 2003). Public participation, if it is to be democratic, must foster trusting relationships through open and honest negotiations between proponents and the public (Barrington et al., 2003).

4.2 Objectives of the public consultation

The overall goal of the public consultation is to engage key stakeholders to provide their inputs into the planned development and especially on those impacts that directly affect the area community livelihoods. The specific objectives of the public participation and consultation in this ESIA are to;

- Comply to the constitutional requirement of chapter four on public participation
- Create public awareness on the project design, implementation and ownership
- Build up confidence between the stakeholders and the proponent to minimize the risk of delays in the implementation of the project.
- Help the project proponent to make informed assessment of public opinion about the project, and the nature and extent of opposition likely to occur during the implementation stage.
- Bring out the contentious issues and give a chance to those who may be affected by the proposed project with a view to minimize negative impacts to give their views.

4.3 Methodology

A combination of tools including interviews, Focus Group discussions, key informant interviews, administering of questionnaires and community meetings (public barazas) held on 13th January, 2022 for environmental and social impact assessment. Various stakeholders were incorporated into the consultation processes. A stakeholder identification and involvement based on various needs, interest and potential influence to the project was used. The stakeholders consulted were; the direct project beneficiaries of the development or directly affected (primary stakeholders) and those indirectly affected by the project but influence development departments and local administration (secondary stakeholders). A total of 55 participants were present 20 female (of which 6 were youths) and 35 male (of which 9 were youths). Public consultations took off from the scoping

stage once the ESIA process was commenced with the main objective of involving the public in to the design of the project so as to identify and mitigate the likely negative project effects and promote the positive ones. Discussions and interviews with key informants provided relevant information using the following PROCESS:

1. Resource person/ key informants who involved interviews with the proponent, management committee of Kabayi irrigation scheme, local administration, among others.
2. Administration of simple questionnaires to the community. Filled questionnaires are annexed to this report.
3. Public baraza at the project site 13/01/2022 - this was attended by the community including the immediate members to the site, chief, Village Administrators, Area MCA representatives, Land surveyor and Engineer, Kisumu County Environment officers and KCSAP officials.

4.4 Reconnaissance of the Project Area

The preliminary field visit was undertaken on 4th January 2022 lead by the Lead Expert Ratemo Sammy Kinara, Associate Expert: Walala David, and the proponent Engineer: Eng. Reginald Olang. The meetings intended to: -

- Familiarize with the project area.
- Obtain deeper information regarding the project areas;
- Obtain the general perception regarding the project

The visit helped Ecofix Consultant appreciate the project components and link it to the environment and social baseline conditions. Ground trothing with the help of GPS was done to identify the proposed site for water intake along River Kabayi as well as the construction of pipeline and the main water hydrant points. (See Figure 4-1)

4.5 Stakeholder Engagement

Stakeholder consultation was held on 13th January, 2022 whereby the meeting was convened by the consulting firm with the assistance of the area chief and village elders. Covid 19 protocols were observed during the meeting (see the Appendix VII: Attached Photo Logs);

A total of 55 participants were present 20 female (of which 6 were youths) and 35 male (of which 9 were youths) ,49 questionnaires were filled in and returned. Some community members were guided in understanding and filling of the questionnaires through translation where necessary (see Appendix VI),

A total of 5 key informant interviews were administered on 13th January 2022, to the representatives from the key county departments including the livestock, environment, local administration (chiefs), village and ward administrator and project personnel (see Appendix V: Filled Key Informant Interview.

One formal consultation meeting was held for technical persons from the key county and national government departments and another one for the panel of experts during the preplanning phase of the project. This culminated in the environmental and social screening in the project pre planning phase. The pre-project engagement and feedback from the community and stakeholders was used to inform the scope of the ESIA and in minimization of the significant predicted impacts.

4.5.1 Concerns and issues raised

4.5.1.1 Positive impacts and issues arising from public participation

During public participation, the community pointed out that the project will have positive impacts in their lives. They included: -

- Increased agricultural production,
- Reduced crime rate in the area,
- Adoption of climate smart farming practices,
- Economic growth and empowerment especially the women, youth and PWD,
- Availability of water will mean continuous farming / cultivation,
- Create employment opportunities, and
- Enhanced food security and nutrition.

4.5.1.2 Negative issues arising from public participation

In general, there was no community objection to project implementation during the consultative process. However, the community members were concerned on how the following issues will be dealt with and this has been addressed on the ESMP.

- Water pollution in the nearby river;
- Increase in social evils like theft, conflicts among farmers, child labor, sexual immorality;
- Increase in water borne diseases.

4.5.1.3 Summary of main concerns raised

Stakeholder	Issue	Aspect/concern raised by stakeholders	Suggested mitigation measure
Community member	Employment of locals	Concern was raised as to whether locals will get opportunity in recruitment for labour required during the construction process	T priority should be given to local community members where available
Village Administrator	Water pollution	Raised concern for possibility of the pesticides to be used in the farms to drain into the nearby water bodies	Training on prudent use of pesticides
Community member	Soil erosion and flooding	Anticipated soil erosion and flooding in the area	train the farmers on soil management practices.

4.6 General comments from public consultation

- It was noted that during construction phase, there will be employment opportunities for local residents. The project will inject a significant amount of money into the local economy during construction/Installation phase
- It was noted, that the project will create secondary business due to influx of workers in the region,
- The project will promote irrigation during dry spells to cushion farmers against crop damage / loss during droughts,
- The project will increase area under crop production, increase water storage, reduce water velocity as well as decrease soil degradation;

Contrary to the positive impact listed above, the community members listed some key negative impacts including:

- The project command area may have non-point sources of pollutants including nutrients (particularly nitrogen and phosphorous), sediment and pesticides on water sources;
- Potential source of conflicts and misbehaviour arising from construction workers;
- Potential for breeding grounds for mosquitoes hence increase in malaria cases;

Figure 4-2 below is the Wad administrator addressing the community members



Figure 4-12" Ward administrator addressing the community members

5 POTENTIAL IMPACTS FOR THE PROPOSED PROJECT

5.1 Introduction

This section discusses the potential environmental and social impacts identified and evaluated. The assessment of impacts depended on the nature and magnitude of the activities being undertaken as well as the type of environmental control measures that are envisaged as part of the project proposal.

5.2 Impacts during construction phase

5.2.1 Potential beneficial impacts during the construction phase

- **Increase area under Cultivation:** The project will help farmers increase area under crop production by approximately 150 acres of land,
- **Increase water storage:** The project will secure three big tanks that will be used for the storage of the water within the 6 farming blocks,
- **Improve farmers' income and livelihood** by diversifying the crop at farm level as well as availability of crops throughout the year,
- **Reduce water velocity along River Kabayi** and its floodplain thus decreasing soil degradation;
- **Control of floods** due to proper channeling of flood plain water to the filed rehabilitated channels; and
- **Cushion farmers from crop damage** / loss during drought period.
- **Economic boost:** A large sum of the project money shall be released into the local economy due to the construction activities and later during the selling of farm produce,
- **Creation of market for construction materials:** The project will require materials, some of which will be sourced locally within the project area.

Enhancement measures

Encourage the contractor to source construction materials from the local market/ within the Sub County as opposed to importing from another county

- **Employment opportunities:** The creation of employment opportunities is beneficial both from the economic and social point of view. Economically, it means abundant unskilled labor will be used in digging of trenches, laying of pipes, and transport of construction materials.

Enhancement measures

-The project to ensure that all the project requirements are fulfilled

-Apportioning workers work that would not lead to few people doing a lot of work in a bid to save costs by the contractor

- **Growth of secondary business opportunities:** there are companies or individuals who will be contracted to supply food and other services. Other businesses that stand to benefit from the project include hotels and commercial outlets selling irrigation infrastructure spare parts among others.
- **Technology transfer and opportunities for skills acquisition:** implementation of the project activities will require several trainings to the farmers by extension officers; farm water management and various aspects of crop husbandry so as to promote productivity through capacity building programs.

5.3 Potential Adverse Impacts and Mitigation Measures During Construction

5.3.1 Negative Biophysical Impacts

5.3.1.1 Noise Pollution

Construction of the barrier across the River Kabayi to raise water level for abstraction will most likely result in elevated noise emissions as a result of the machines that may be used (excavation equipment at the intake) and construction vehicles delivering materials to the site. The said noise could impact negatively on the workers during the construction phase. Noise can also be a nuisance to the local community if construction works begin too early in the day and continues into the night. Note that: This noise level is not anticipated to be beyond the permissible levels of 85 dBA: labour intensive techniques will be preferred to the use of machine and given the location of the water intake away from residences.

Mitigation Measures

Minimize the impacts of temporary construction noise and vibration by:

- Inform local residents of any abnormal noise generating construction activities to minimize disruption to local resident
- Post notices at the construction sites informing the public of the construction activities, time and day.
- Planning the construction work to take place only during the day between 0700 hours and 1800 hours
- Ensuring that the workers and the visitors to the site wear Ear plugs and/or earmuffs

5.3.1.2 Dust Emissions

Dust will be emitted during excavation and related earthworks. Air borne particulate matter pollution is likely to occur during the route clearance, excavation and during the transport of construction materials. This is likely to affect site workers and the residents, in extreme situations leading to respiratory problems.

Mitigation Measures

- Strict measures be applied for the handling of construction materials in powder form such as cement, lime, concrete additives, etc.
- Excavation, handling and transport of erodible materials shall be avoided under high wind conditions or covered by tarpaulin while on transit.
- Wet all active construction areas as and when necessary to lay dust;
- Vehicle speeds be limited to a maximum of 30km/h.

5.3.1.3 Workers Accidents and Hazards during Construction

Construction workers are likely to have injuries and hazards at the construction works, unavoidably exposing them to occupational health and safety risks. The workers are also likely to be exposed to risk of accidents and injuries resulting from accidental falls, injuries from hand tools and construction equipment.

Mitigation Measures

- All workers will be sensitized before construction begins on how to control accidents related to construction.
- Maintain an accident/Incident Register
- A comprehensive contingency plan will be prepared before construction begins on accidents response.
- Accordingly, adherence to safety procedure will be enforced.
- All workers to wear protective gear during construction including helmets.
- Availability of first Aid Kit at active construction site,
- Construction work should be limited to daytime.
- An investigation should be initiated immediately to ascertain the cause of the accident and preliminary findings released within 12 hours.

5.3.1.4 Extraction and use of Construction Materials

Construction materials that will be used in the construction of the intake and water hydrant points such as: hard core (will be obtained from quarries) and sand which will be harvested from natural resource banks such as rivers and land. Harvesting of hard core and sand may create potential death trap (deep hole with accumulated water) if not rehabilitated to near initial state and fall of river banks. The proposed development is category “B” with very less volume of materials required, thus it is associated with low medium and site-specific impacts than can be adequately mitigated.

Mitigation Measures

- Buy strictly from area designated as a sand harvesting site that have NEMA approval,
- Source building materials from local suppliers who use environmentally friendly processes in their operations and restrict the sourcing of materials from registered and licensed suppliers,
- Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered.
- Ensure that damage or loss of materials at the construction site is kept minimal through preservation of valuable natural resources, extensive cohesive areas in their natural state

5.3.1.5 Solid Waste Generation

Solid waste generated during construction include papers used for packing, plastics, cuttings and trimmings off materials among others. Dumping around the site will interfere with the aesthetic status and has a direct effect on the surrounding community. Disposal of the same solid waste off-site could also be a social inconvenience if done in the wrong places. The off-site effects could be vector

or pest breeding, pollution of physical environment including water resource, invasion of scavengers and informal recycling by communities.

Mitigation Measures

- Ensure waste are recycled / reused before opting to dispose of,
- Use of waste receptacles to hold waste on site before its collection,
- Use of durable, long-lasting materials that will not need to be replaced often,
- The proponent to carefully budget for construction materials in order to minimize leftovers on site after construction
- Designate temporal waste / garbage holding areas at site
- Provide legible waste bins of different waste streams with covers,
- 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;

5.3.1.6 Loss of flora

The proposed project will involve clearing of vegetation cover especially where the water pipes will be laid. From the field visits, the areas selected have sparse and shrubby vegetation cover. Soil organisms including a variety of insect family are common and will inevitably be affected during the construction and operation phase of the project. The impacts will however be on short term and should not lead to a permanent change for the worst.

Mitigation Measures

- Re-establish vegetation in parts of the disturbed areas through implementation of a well-designed landscaping program by planting of appropriate indigenous plants such as *Sesbania sesban*, *Leucaena calothursis*.
- Rehabilitate all sites that are being used for construction activities such materials lay down area for storage materials and any paths, tracks that may be established during the construction phase.
- Clearance to be done only in areas earmarked for the project,
- Buffer zones to be left as intact as possible,
- Creation of awareness among the farmers and construction workers on the importance of conserving biodiversity.

5.3.1.7 Change of soil properties and accelerate soil erosion

The clearing of the vegetation cover will expose soil to potential agents of erosion including wind and surface water runoff. The top soil will be carried away thus the remaining soil cover will be of different properties compared to the one carried away. However, this impact will be limited to project area footprint that is minimum thus limited impact expected.

Mitigation Measures

- Ensure proper demarcation and delineation of the project area to be affected by construction works.
- Introduction of vegetation (trees, shrubs and grass) on open spaces and around the project site and their maintenance.
- Design and implement an appropriate landscaping program to help in vegetation of parts of the project area after construction.

5.3.1.8 Soil compaction

As trucks, machines and people move on the ground, the soil is compacted. Compaction has the undesired effect of hindering air and water penetration beneath the soil surface and enhances surface runoff resulting into soil erosion and siltation.

Mitigation

- Ensure only the areas demarcated for the project are used by the truck and other project activities thus limiting compaction and trampling upon vegetation.
- Rip off compacted areas in areas where compaction will have adversely affected after construction to allow aeration of soil and ease infiltration of water into the soil.
- Supervise all construction workers. All excavation and cutting to take place as instructed in the approved structural plans for the proposed structures.

5.3.1.9 Impact to Fauna including aquatic Life

The construction of barrier across the river to raise water level for abstraction into the pipeline may affect aquatic life breeding ground in the river due to increased siltation and sedimentation of silts in the stream. On the other hand, clearing of vegetation where the temporal structures and stockpiling of materials will take place may interfere with the underground biodiversity by exposing them to harsh environment.

Mitigation Measures

- Ensure ecological flow of water to the downstream,
- Confirm the removal of vegetation to the extent possible to the project areas,
- Planting of vegetation should be undertaken after the pipes are covered with soil;
- Re-vegetate using indigenous tree and grass species whenever possible;

5.3.1.10 Increased traffic flow

During construction, there will be an influx of traffic to and from the proposed construction sites. These will include vehicles used in facilitating the construction work and people seeking employment opportunities, workers, managers, environmental inspectors and suppliers of foodstuffs to the construction workers. Though increased traffic during construction is a short term impact, it has the effect of causing congestion on the road which may subsequently results in accidents on the roads.

Mitigation Measures

- Proper planning of transportation of construction materials to ensure that vehicle fills are increased in order to reduce the number of trips done or the number of vehicles on the road.
- Place clear signage at the gate to alert drivers to be cautious about the construction and to look out for entering and/or exiting vehicles.
- Create and designate a parking space and provide for adequate space at the turning point at proposed sites to give drivers enough room to maneuver in and out.

5.3.1.11 Increased demand for water

Construction works will create demand for water in addition to the existing demand. Water will mostly be used during construction for wetting surfaces or cleaning/curing completed structures. It will also be used by the construction workers to wash and drink.

Mitigation Measures

- the contractor shall ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water use;
- Any water handling equipment, facility and systems shall be appropriate for the intended usage. Water used on the construction shall reflect the level of conservation achieved by the contractors. Documentation of amounts of water used will therefore be mandatory
- Apply and stick to the stipulations of the water abstraction permit issued by WRA.

5.3.1.12 Fire hazards

There is potential for fire hazard during the fixing of the pipes within the proposed irrigation area.

Mitigation measures

- Availability of the Firefighting equipment on site,
- Signs such as “NO SMOKING” must be prominently displayed at the site
- Training workers on fire emergency response,

Formulate and enforce fire action plan,

5.3.1.13 Unhygienic condition within the project area

Improper sanitation arrangements by construction workers may cause contamination of water.

Mitigation Measures

- Provision shall be made for worker’s facilities including shelter, toilet(s) and washing facilities
- These facilities shall be maintained in a hygienic state and serviced / emptied regularly to mitigate environmental pollution.
- The contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from site to an approved disposal site by licensed waste handler.
- Discharge of waste from toilets into the environment and burying of waste is strictly prohibited.
- Wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas, which include groundwater, are not polluted.

5.3.2 Negative Social Impacts and risks

5.3.2.1 Increased Cases of HIV/AIDS and STIs

The proposed project may lead to labor influx due to need for the workforce to construct and install the irrigation infrastructures. This may stimulate business in the project area and the spread of STIs and HIV/AIDS. There could also be cases of unwanted pregnancies as the migrant workers interact and get into relationships with the local communities.

5.3.2.2 Unhygienic condition within the project area

Improper sanitation arrangements by construction workers may cause and or pose a major health hazard, and outbreaks of diseases such as diarrhoea, cholera and typhoid.

Mitigation Measures

- Toilet facilities (Portable) supplied by the contractor for the workers shall occur at a minimum ratio of 1 toilet per 30 workers (preferred 1:15).
- All temporary/portable toilets shall be secured to the ground to prevent them toppling due to wind or any other cause.
- The contractor shall ensure that the entrances to toilets are adequately screened from public view.
- These facilities shall be maintained in a hygienic state and serviced regularly.
- Toilet paper, soap and hand washing facilities shall be provided,
- The contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from site to an approved disposal site by licensed waste handler.
- Discharge of waste from toilets into the environment and burying of waste is strictly prohibited.
- Wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas, which include groundwater, are not polluted.

5.3.2.3 Increase in spread of COVID 19

During project execution, workers will be required to assemble together during 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 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 work. This may lead to increase in the spread of COVID 19.

Mitigation Measures

- Avoid concentrating of more than 15 community members at one location. Where more than one person is gathered, maintain social distance of at least 2 metres;
- Comply with the government's directives for combating Covid-19 such as washing of hands, wearing of face masks.
- Use temperature guns to detect any anomaly of body temperature at the site,
- The team carrying out engagements within the communities on one on one basis should be provided with appropriate PPE for the number of people they intent to meet

- Enhancing education and sensitization of workers and the local communities on the dangers and prevalence of Covid 19
- The project should put in place means to support rapid testing of suspected workers for Covid 19
- Ensure routine sanitization of shared social facilities and other communal places routinely

5.3.2.4 Child Labour

. There is a possibility that the contractor may opt to engage their children work as a form of cheap labor services.

Mitigation measures

- Enforce laws prohibiting child labour
- Educate the farmers and the students on the benefits of education
- Work closely with teachers to ensure pupils and students stay in school
- During construction, the contractor should adopt a ‘Child Protection code of Conduct’ that all staff to the contractor should must sign, committing themselves to protecting children and ensure that appropriate disciplinary actions is taken against any staff who goes against the code of conduct and engages in any sexual crime against children.
- Ensure no children are employed on site in accordance with the national labour laws

5.3.2.5 Effects of Migrant workers and moral decadence

This may be due to lack of skilled people within the project areas, or due to speculative followers who follow the project seeking employment and business opportunities. This may attract criminal or illicit behaviours. With the expected increase in income among communities, there is likelihood in change of behaviour among the community members too. Members may turn to alcohol and substance abuse, prostitution, robbery; due to increased income and bad influence.

Other impacts include:

- Increased demand and competition for local social amenities as well as for goods and services, which can lead to price hikes beyond the reach of the local consumers.
- Conflicts between locals and non-locals concerning employment opportunities, wages, natural resources, or over matters concerning religious, cultural or ethnic differences
- Rise in incidences of unplanned pregnancies

Mitigation Measures

- The workforce should be sensitized on local and cultural practices and be educated on the expected behaviours and conducts
- The contractor should prepare and implement a gender action plan to ensure that the grievance redress mechanisms are adhered to,
- Contractor should use the local workforce as much as possible
- Sensitize the farmers to embrace social moral principles
- The local administration to enforce of law
- Educate farmers and the communities on effects of drug and substance abuse
- Money should be paid to bank and not cash.

5.3.2.6 Crime and insecurity

Construction sites tend to be a target for thieves and vandals because valuable items are left on site for a considerable amount of time. Increased number of people from different backgrounds and income, may lead to insecurity resulting in robberies, deaths, among others. This can directly impact the success of a project and diminish the potential profitability of the project under construction.

Mitigation measures

- Work with the local administration and Nyumba Kumi initiative to enforce the law and provide security within the site in addition to the contractor's own security.
- Ensure that only those who work at the site are allowed to the site.
- Sensitize the community on how to improve security in the area.
- Ensure that all activities of a criminal nature on the worksite or by contractor's employees are reported to the police.
- Prohibit alcohol, drugs, arms on the worksite among personnel.
- Reasonable precautions should be put in place to prevent unlawful, riotous or disorderly conducts among the contractor's workers to preserve peace and protections of persons and property on and near the construction site.

5.3.2.6 Gender Based violence, sexual harassment and exploitation

Construction sites may promote long working hours and excessive risk taking. This does not favor women since they are the ones often responsible for most household activities in their families. The result of this discriminatory environment leads to a small number of women who in turn often become the focus of inappropriate attention from their male workers. Gender based violence and harassment of women on site can follow, making the work environment a hostile place for the women. In addition, senior workers or supervisors may take advantage of junior female workers to seek sexual favors in return to promotion or favorable work environment. This can take various forms such as;

- Sexual exploitation and abuse
- Verbal and sexist abuse
- Psychological abuse, intimidation and threats of violence
- Economic and financial abuse
- Physical abuse including assault
- Sexual violence including rape and sexual assault
- Sexual harassment

Mitigation Measures

- Hire a fulltime social/environmental specialist in the supervision team with Gender Based Violence (GBV) specific skills to supervise issues related to GBV in the work place
- Ensure that women and minority group community members are provided opportunities to meaningfully participate in decision-making processes concerning location of services such as toilets and accommodation.
- Liaise with local/host authorities to encourage them to participate and take an active interest in the host community's welfare
- The contractor should employ and train committed female staff to positions of authority. These will help promote the employment of female staff

- Provision of gender disaggregated bathing, changing, sanitation facilities
- Whenever harassments are recorded on site, the contractor should ensure prompt and effective remedial action
- The employees should be trained and sensitized on appropriate behavior on the construction site and within the residences.

Strive for an equitable distribution of employment opportunities between men and women.

5.3.2.7 Discrimination against PWD and vulnerable groups

This may happen when the contractor hires workers and discriminates on basis of vulnerability and disability.

Mitigation Measures

- The contractor to ensure that people with vulnerability and disability are appropriately deployed at work,
- provide disability friendly facilities within the site for PWDs Strict disciplinary measures to be taken against those discriminating against anybody.
- Access to the irrigation facilities to be equitable.

5.3.2.8 Potential Archaeological resources

From the field studies, there are no known impacts on archaeologically protected monuments and cultural properties in the proposed project area.

Mitigation Measures

- Implement a chance find procedure (see Appendix X) and
- Liaise with the directorate of Directorate of Antiquities Sites and Monuments for safeguarding the Finds.

5.3.3 Negative Impacts during the decommissioning of the Construction Infrastructures

When the decommissioning of the contractors support infrastructure used in the construction of the barrier across the River Kabayi to raise water level for abstraction and primary piping; the under listed negative impacts are expected.

- Loss of livelihood to contractor staff due end of the construction activities and or community service provider to the contractor,
- Soil erosion will occur as a result of removal of materials from the site exposing soil to agents of erosion
- Visual impact nuisance,
- Generation of waste material comprising concrete rubble, steel and disused pipes and fittings;
- Risk of accidents to workers, and
- Noise pollution from the dismantling of temporal work stations at the site.

5.4 Impacts during operational phase

5.4.1 Potential beneficial impacts during the operational phase

5.4.1.1 Contribution to the micro-climate

The supply of irrigation water to the farms in the project area will motivate the farmers to grow crops, fodder crops for the animals and trees. Through this, there will be seasonal fluctuation of flora and fauna species. This means that micro climate within the project area will be enhanced. This will immensely contribute to the property, land and aesthetic values of the area while ensuring that the environment remains healthy and productive.

Enhancement Measures:

- Encouraging farmers to plant variety of crops and to use conservation agriculture so as to conserve the soil

5.4.1.2 Creation of Employment

During operational phase, there will be employment opportunities especially for those who will be employed to manage irrigation water supply system. A number of youths within the project area will be employed in the farms to undertake such activities as cultivation, weeding, harvesting among others. This will improve their living standards and positively change their social behavior.

5.4.1.3 Creation of Wealth and Improvement of local Infrastructures

The proposed irrigation project will ultimately provide revenues to the beneficiaries and expand the wealth base at local and national level. The expansion of irrigation project and increased agricultural produce is meant to bring about other infrastructural developments such as market expansion of the biweekly open market at Daraja Mbili, and local centers like Sianda, Sinyolo and Rabwoli. There will be need to improve the roads used in transporting the produce and farm inputs. The produce will also attract more businessmen and women during the peak harvesting time.

5.4.1.4 Improved Food Security

Crop production through rain-fed agriculture has not been adequate due to unreliable rainfall patterns, the resultant case is food shortage in the households. The introduction of irrigated agriculture through the proposed project will increase crop production and thus alleviate the food shortage problem in the households. Surplus produce could be sold and earn households much needed incomes.

Enhancement Measures

- Encouraging farmers to plant variety of crops to diversify the diet.

5.4.1.5 Improved Well-being of Women and Children

At the household level, women and children bear the burden of fetching water. Other than the time spent in getting water from long distances, these practices has far reaching consequences on their health and wellbeing.

Water from the protected spring will be accessible to for domestic use thus translate to time saving to women and children. Time saved thus would be invested in other engagements that could bring financial benefits to the family. Children also bear the brunt of water borne diseases while women are tied down to provide nursing care to the sick family member. With proximity of water all these negative impacts will be reversed in the project area.

5.4.2 Potential Adverse Environmental Impacts During operations

5.4.2.1 Pollution of Water

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. This might also find their way into the river and thus impact negatively the downstream ecosystems.

Mitigation Measures

- Promote Integrated Pest Management (IPM) Practices incorporating crop management control techniques, biological control and restricted use of biocides in order to lessen the adverse effects of biocide use in line with BP OP 4.09;
- The farmers should be trained on adequate amounts of fertilizers and biocides to be used for various crops and on safe use of these chemicals;
- Develop Pest Management Plan for the Project,
- Liaise with Agrochemicals Association of Kenya to help with training in handling of agrochemicals.

5.4.2.2 Soil Erosion

Soil erosion from cultivation of steep slopes and stream banks in the project area will lead to silt deposition in the rivers. This will increase the turbidity levels in the rivers and could also affect the hydrology of the rivers and the downstream ecosystems.

Mitigation Measures

- It is necessary that slopes be stabilized with Napier grass planted along contours before irrigation is undertaken.
- Avoid encroachment and clearing of vegetation cover along R. Kabayi.
- Minimize and plainly define land clearing areas.
- 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 agro forestry, conservation tillage and contour farming.
- Public awareness programs should be conducted during project implementation to ensure that beneficiaries, IWUA and scheme management understand and take up their role in catchment management, and
- Train farmers in soil and water management to avoid land degradation.

5.4.2.3 Health and Safety Risks

Farmers will be exposed to use of agrochemicals that are toxic to their health and that of their livestock if not handled with utmost care.

Mitigation Measures

- Farmers should use personal protective gears while applying agrochemicals especially when using knapsack sprayer,
- Health and safety risks should be minimized by conducting farmers training on the safe and effective use and storage of chemicals and basic first aid procedures;
- Keep agrochemical (pesticide and herbicide among others) in their original package away from reach by children and mature people as well,
- Maintain Material Safety Data Sheets (MSDS) for agro-chemicals for references; and
- Store chemicals as recommended in the MSDS.

5.4.2.4 Increased Generation of Wastes

There will be an increase of organic, inorganic and toxic waste. Waste expected from the site include: packaging materials, farm by-products and obsolete pesticides. The packaging materials for the pesticides will be some of the waste generated from the project. Some of this waste is hazardous thus dangerous to the public if not stored and disposed of in an environmentally sound manner as prescribed by Environmental Management and Co-ordination (Waste Management) Regulations 2006, Pest Control Products Act of 2012 and meeting the requirements of the World Bank OP 4.10 Environmental Assessment and also OP 4.09 Pest Management Policies.

Mitigation Measures

- The scheme management should conduct periodic training for beneficiaries on safe disposal of wastes.
- Agrochemical Wastes/Hazardous waste (i.e. packaging containers) should be stored away from reach by children and returned to agro-dealers for safe disposal.
- Record of waste transfer notes should be kept by the farmer / Agro-Input Dealers.

5.4.2.5 Increased traffic flow

Traffic flow will increase due to the increase in number of people coming to pick farm produce due to increased production hence leading to dilapidation of feeder roads, accidents and potential to inconvenient other road users.

Mitigation Measures

- Place clear signage at the gate to alert drivers to be cautious and to look out for entering and/or exiting vehicles.
- Create and designate a parking space and provide for adequate space at the turning point at sites to give drivers enough room to maneuver in and out.

5.4.2.6 Impacts related to occupational and public health and safety risks

The likely occupational and public health and safety risks associated with the proposed irrigation scheme include: drowning (this may happen at the Intake due to its depth of the obstructed water during operations when the areas are not condoned off), poor sanitation resulting from presence of potential environmental pollutants at the site including used chemicals containers and contaminated personal protective equipment. Human health impacts as a result of improper/ non-use of PPEs during handling and application of chemicals.

Mitigation Measures

- Barricade Intake area using a barbed wire,
- Sensitize communities on dangers of going into the intake area
- Install warning signs at dangerous areas,
- provide suitable PPE and ensure they are worn,
- Provide hazard notifications, signage and warnings to warn visitors and staff of potential dangers that may exist in different areas of the project, or warn the persons on potential consequences of their actions should be put in place;
- Dispose wastes from the site regularly and ensure high standards of cleanliness of all waste disposal facilities.
- Advice farmers and visitors to take precautions not to cause any effect on their own health or to the health of other persons.

5.4.3 Potential Social Adverse Impacts During operations

5.4.3.1 Water use Conflicts

Uneven distribution of irrigation water between the beneficiaries will result into water use conflicts. This scenario will arise when some farmers located in the upper section of the project will over abstract the water and minimize the water availability to the downstream irrigation water users. This will result in conflicts and could even interfere with the sustainability of the project. Secondly, too much abstraction of water from the river would result into conflicts between the upstream and downstream users.

Mitigation Measures

- Develop means to ensure equitable distribution among users and monitor to assure adherence.
- The project should only abstract authorized quantity of water from the River and abide by the requires of the Water Resources Authority (WRA);
- The irrigation water committee should ensure only authorized quantity of water is abstract and abide by any other conditions set by WRA;

- Kabayi Irrigation Water Users Association (IWUA) should be formed.
- The irrigation water committee should participate in the activities of Kabayi IWUA to ensure successful water management, apportionment and environmental protection;
- The committee will be required to form strict by-laws that will guide on water usage and conflict resolution in the irrigation scheme; establish a GRM subcommittee of the IWUA, train them on conflict handling and management and resolution.
- Conduct training on water saving technology to ensure efficient water use;
- Install master water meter at the intake;
- Install water meters at farm and household level;
- Use irrigation to grow water productive crops;
- Develop irrigation schedules systems to aid farmers on making decision on when to irrigation and how much water to apply.

5.4.3.2 Increase in Waterborne / Related Diseases

Once the irrigation water is supplied to the farms, some households may use the same as drinking water and for domestic use without any treatment. This may increase the chances of contracting waterborne diseases such as typhoid and cholera. There may be increased chances of stagnating water in the farms and thus attracting the breeding of disease vectors like mosquitoes which will be responsible for the spread of malaria. This may lead to ill health problems among the residents and even increase the chances of child mortality rates in severe cases.

Mitigation measures

- Train farmers on household water treatment to guard against raw water use.
- Train farmers on proper disposal of agro-chemical used packaging materials that can breed vectors,
- Incorporate drainage infrastructure and ensure that they are well maintained. Cases of waterborne diseases, water pollution and waste disposal should be adequately addressed.

5.4.3.3 HIV/AIDS and STIs Impacts

The prevalence of HIV/AIDS in the area could increase due to free-flow and high influx of people during the operation phase. The influx of people into the project areas may result in increased interactions and intimate relationships leading to infections of diseases such as HIV/AIDS and STIs.

Mitigation Measures

- In conjunction with the county health officers, sensitize project management committee workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and STIs.
- Use of existing clinics to provide VCT services to construction crew and the scheme workers
- Development of brochures and other materials that will convey information about the diseases and infections,
- Regular provision of adequate prevention measures such as condoms and provision of drugs such as anti-retroviral drugs (ARVs),

- Enhancing education and sensitization of workers and the local communities on the dangers and prevalence of disease,
- Regular sensitization campaigns and monitoring of the spread diseases,
- Access to contractor's camps by the outsiders should be strictly controlled.

5.4.3.4 Increase in prevalence of communicable diseases (Spread of COVID 19)

During operation phase, project management committee members and communities will be required to assemble together during meetings, talks and even at work sites; varied number of workforce and technical support services are also expected to come in and may be from COVID-19 hot spots like Nairobi and Kisumu City; and interaction of farmers who are the host community with the guests from the COVID 19 hot spot areas may be associated with transmission. After this farmer will or return to their homes after work and interaction with their family members may lead to increase in the spread of COVID 19 cases.

Mitigation measures

- Avoid concentrating of more than 15 community members at one location. Where more than one person is gathered, maintain social distance of at least 2 meters;
- Comply with the government's directives for combating Covid-19 such as washing of hands, wearing of face masks.
- The team carrying out engagements within the communities on one on one basis should be provided with appropriate PPE for the number of people they intent to meet
- Enhancing education and sensitization of workers and the local communities on the dangers and prevalence of Covid 19
- Use of temperature guns for rapid diagnosis of suspected workers for COVID 19; and
- Ensure routine sanitization of shared social facilities and other communal places routinely.

5.4.3.5 Child Labour and school drop outs

There is a possibility that parents or guardians would opt to engage their children work in the farms due to the improved returns from crop farming leading to possible cases of school drop outs.

Mitigation measures

- Enforce laws prohibiting child labor;
- Educate the farmers and the students on the benefits of education;
- Work closely with teachers to ensure pupils and students stay in school;
- During construction, the contractor should adopt a 'Child Protection code of Conduct' that all staff to the contractor should must sign, committing themselves to protecting children and ensure that appropriate disciplinary actions is taken against any staff who goes against the code of conduct and engages in any sexual crime against children.
- Ensure no children are employed on site at the cost of missing schools.

5.4.3.6 Effects of Migrant workers and moral decadence

During the operation phase the Irrigation activities will attract labor force from communities outside the recipients of the project. This may be during the pick time of weeding, harvesting and sale of the farm produce. This labour flows may attract criminal or illicit behaviors and moral decadence.

Mitigation

- The workforce should be sensitized on local and cultural practices and be educated on the expected behaviours and conducts
- The contractor should prepare and implement a gender action plan to ensure that the grievance redress mechanisms are adhered to,
- Contractor should use the local workforce as much as possible
- Sensitize the farmers to embrace social moral principles
- The local administration to enforce of law
- Educate farmers and the communities on effects of drug and substance abuse, and
- Money should be paid to bank and not cash.

5.4.3.7 Gender Based violence, Sexual Harassment and exploitation

Working in the irrigation field often promote long working hours and excessive risk taking especially woman while in the garden alone. This does not favor women since they are the ones often responsible for most household activities in their families. Gender based violence and harassment of women on site can follow, making the work environment a hostile place for the women. Also men may turn have sexual advances to women while in the garden due to increased income.

Mitigation Measures

- Ensure that women and minority group community members are provided opportunities to meaningfully participate in decision-making processes concerning location of services such as toilets and accommodation;
- Liaise with local/host authorities to encourage them to participate and take an active interest in the host community's welfare;
- Train committed female staff to positions of authority to create awareness of GBV/SEA. These will help promote the employment of female staff;
- Provision of gender disaggregated bathing, changing, sanitation facilities if provided in the fields;
- Sensitization of the community members against GBV/SH;
- Whenever GBV/SH harassments are recorded on site, the community leaders should ensure prompt and effective remedial action; and
- Strive for an equitable distribution of employment opportunities between men and women.

5.4.3.8 Food safety issues

The need for the quick economic return as well as availability of farm produce, farmers may be tempted to harvest the produce for sale before pre-harvest interval after chemical application.

Mitigation Measures

- Proper extension service should be availed to farmers, including the World Bank due diligence on pesticides procurement, use and management, and
- Observe the pre harvest timeline required after spraying produce with agrochemical.

5.4.3.9 Family conflicts and breakups

Family conflicts and breakups may arise due to mismanagement of money, prostitution and other challenges associated with management of increased income.

Mitigation Measures

- Educate the farmers on financial management,
- Train the community on conflict resolution mechanisms,
- Encourage couples to have joint bank accounts.

5.5 The decommissioning plan

The decommissioning of the irrigation project could occur if the project outlived its designed useful period. A decommissioning plan will be prepared and submitted to NEMA three months before decommissioning takes place.

The following components of the irrigation scheme will be decommissioned;

- i. Concrete abstraction material use to obstruct water at the Intake point;
- ii. Concrete base foundation for Water Reservoir Tanks (3);
- iii. Man hole at the Water Hydrant points;
- iv. Pipes used in the Piping systems; and
- v. Valves and Drip line / sprinklers.

The decommissioning of the project support components associated with the irrigation scheme infrastructures including removing all concrete debris from the site, reinstatement of excavated hollow areas where 3-reservoir tanks had some concrete foundations, removing pipes and associated valves, removal of man hole for water hydra points among others.

5.5.1 Solid Waste

During dismantling and demolishing of the irrigation scheme infrastructure solid waste will be generated in large volumes and if not handled may encourage scavenging and associated littering in the area.

Mitigation:

- All machinery, equipment, structures, tools that cannot be reused or recycled shall be removed from site,
- NEMA licensed waste handler will collect, transport and dispose of the demolition waste from the site,
- All debris/wastes to be collected regularly

- All waste materials from the site should be taken into approved dumping sites.
- Proper record of waste shall be kept including the waste transfer notes and dumping / destruction certificate.

5.5.2 Loss of Vegetation Cover

Demolition activities is associated with site clearance and the removal of existing vegetation to provide debris laydown areas. These practices remove ground protective plant cover and expose the soil to erosive surface runoff during heavy rainfall events as well as wind erosion. The inappropriate management and handling of the cleared area could lead to associated negative impacts on local air quality due to dust generation.

Mitigation measures

- Do re-vegetation of the site to restore the site to its original status.
- During demolition, appropriate surface run-off controls will be undertaken to minimize erosion rates Constant monitoring.

5.5.3 Occupational Health Hazards

Demolition works will inevitably expose workers and the public to occupational health and public safety risks: in particular, working at the water abstraction point, handling and use of tools engender certain risks. The demolition workers are likely to be exposed to risk of accidents and injuries resulting from accidental falls, falling objects, injuries from hand tools and other equipment.

Mitigation:

- Secure all unsafe and potentially dangerous areas out of reach to community beneficiaries as well as animals by fencing and warnings posted at the site restricting access.
- Inspection of the demolition works to prevent accidents
- All persons involved in refuse collection shall be in full protective attire.
- All workers will be sensitized before the exercise begins, on how to control accidents related to the demolition exercise.
- A comprehensive contingency plan will be prepared before demolition begins, on accident response.
- Avail of First Aid Kit at the demolition site
- Adherence to safety procedures will be enforced at all stages of the exercise,
- All workers, pursuant to labour laws, shall be accordingly insured against accidents.
- All workers will be provided and instructed to wear protective attire during demolition.

5.5.4 Socio-economic impact

Farmers at Kabayi Irrigation Scheme and community members employed at the irrigation site may lose the livelihood due to decommissioning of the facility, local food vendors to the people working at the site.

Mitigation Measures

- Diversify the community livelihoods i.e. from crop farming to animal husbandry,

- Offer advice on alternative income generating ventures to farmers and workers.

6 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

The Environmental and Social Management & Monitoring Plan (ESMMP) has been developed to assist in prioritizing the key findings of the ESIA, suggesting necessary mitigation actions and allocating responsibilities and the estimated cost of Two Hundred Seventy Thousands shall be used for implementing the mitigation actions.

The purpose of the Environmental and Social Management & Monitoring Plan (ESMMP) for the proposed Kabayi irrigation scheme is to provide mitigation and monitoring measures for the significant negative environmental impacts. The objectives of the ESMMP are:

1. To clearly show how the project will manage the negative impacts while enhancing the positive ones to ensure a project that is economically, socially and environmentally sustainable.
2. To provide evidence of practical and achievable plans for the management of the proposed project.
3. To provide the Proponent and the relevant Lead Agencies with a framework to confirm compliance with relevant laws and regulations.
4. To provide community with evidence of the management of the project in an environmentally and socially acceptable manner.

Environmental and Social Management & Monitoring is an applied research and analysis activity to support cost-effective and timely assessment of the status and trends in environmental and social conditions in response to different project activities. Also, it is necessary to assess the project performance against the desired mitigation measures, and compliance with the regulations and standards in order to protect people's health and safety, and the environment health and performance. Monitoring activities will be applied to direct monitoring indicators whenever applicable.

Indirect indicators can be monitored instead of direct ones whenever it would provide acceptable indication of the occurrence of specific impacts and/or compliance with provisions of the ESMMP as for the Construction, Operational, and Decommissioning Phases as presented on Table 6.1 below:

Table 6-1: Environmental and Social Management and Monitoring Plan

	Recommended Mitigation Measures	Monitoring Indicators	Means of verification	Responsible party	Time frame	Cost (KSH)
Environmental impacts during construction phase						
Noise and excessive vibration	<ul style="list-style-type: none"> Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used, Sensitize construction drivers to avoid gunning of vehicle engines or unnecessary hooting especially when passing through sensitive areas such as schools, hospitals etc Ensure that each construction machinery is kept in good condition to reduce or/and eliminate noise generation, Ensure that the generator and heavy duty equipment are insulated or placed in enclosures to minimize ambient noise levels. The noise generating machines are fitted with silencers Inform the residents of the neighborhood prior in case of possibility of increased noise and vibrations Enclose the construction suite Construction activities to be restricted to daytime Use PPEs such as earplugs, muffs while working at areas of high noise levels 	Number of complaints reported No of PPEs issued to workers No of signage notices	Reports Receipt of purchase of PPEs Complaint register Photos	Contract or Environment officer	Continuous	20,000
Air pollution dust generated during excavation works etc	<ul style="list-style-type: none"> Appropriate handling of construction materials in powder form such as cement, lime, concrete additives, etc. Excavation, handling and transport of erodible materials shall be avoided under high wind conditions or covered by tarpaulin while on transit. Wet all active construction areas as and when necessary to 	No. of complaints on atmospheric emissions No of respiratory infections	Reports	Contract or environment officer	Continuous	10,000/month for PPEs @60k 20,000/

	lay dust; <ul style="list-style-type: none"> • Vehicle speeds be limited to a maximum of 30km/h. • Personal Protective equipment such as respirators, nose masks to be worn by people working in dusty environments • Routine maintenance of the machinery and plant to reduce on fume production. • Cover construction materials (both at the stockpile and on transportation tracks) • Minimize vehicle idling time avoid unnecessary racing of vehicle engines at loading/offloading points and parking areas 	reported No. of PPEs issued	Report from disease surveillance officer Receipts Issuance register			month for sprinkling water
Occupational Safety and Health- causing injuries,	<ul style="list-style-type: none"> • Use appropriate PPEs, • Sensitize workers on the negative health impacts of working dangerously, • Provide a first aid kit at the construction sites for minor injuries, • Employ experienced people to operate the machines and equipment, • On-job refresher training to machine operators, • Training some workers on first aid, • Designate a referral health facility for the workers. 	No. of PPEs issued No of tool box talk held	Accident and injury register Reports on meetings held	Contract or, DOSH Environment officer	Continuous	20,000
Degradation of source of Construction Materials	<ul style="list-style-type: none"> • Source building materials from local suppliers who use environmentally friendly processes in their operations and restrict the sourcing of materials from registered and licensed suppliers, • Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered. • Ensure that damage or loss of materials at the construction site is kept minimal through proper storage. 	No of measures taken to control source degradation	Reports	Site engineer , environ ment officer, contract or	-	-
Solid waste	<ul style="list-style-type: none"> • Ensure waste are recycled / reused before opting to 	Quantity of	Evacuat	Contract	-	-

generation:	dispose of, <ul style="list-style-type: none"> • Use of durable, long-lasting materials that will not need to be replaced often, • The proponent to carefully budget for construction materials in order to minimize leftovers on site after construction • Designate temporal waste / garbage holding areas at site • Provide legible waste bins of different waste streams with covers, • 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. 	wastes generated No of waste bins at the site	ion scheduling	environment Officer	continuous	
Loss of – vegetation cover	<ul style="list-style-type: none"> • Re-establish vegetation in parts of the disturbed areas. • Rehabilitate all sites that are being used for construction activities. • Clearance to be done only in areas earmarked for the project, • Buffer zones to be left as intact as possible, and • Creation of awareness among the farmers and construction workers on the importance of conserving biodiversity. 	Number of trees/ bush within the project areas Increased number of trees planted		contractor	continuous	30,000
Soil erosion	<ul style="list-style-type: none"> • Ensure proper demarcation and delineation of the project area to be affected by construction works. • Introduction of vegetation (trees, shrubs and grass) on open spaces and around fragile the project site and their maintenance. • Design and implement an appropriate landscaping program to help in vegetation of parts of the project area after construction. 	No of soil control measures in place	Report	Contract or environment officer		20,000
Soil compaction	<ul style="list-style-type: none"> • Ensure only the areas demarcated for the project are used by the truck and other project activities thus limiting compaction and trampling upon vegetation. 	No of measures put in place to avoid soil	Report	Contract or/ environment	-	20,000

	<ul style="list-style-type: none"> • Rip off compacted areas in areas where compaction will have adversely affected after construction to allow aeration of soil and ease infiltration of water into the soil. • Supervise all construction workers. All excavation and cutting to take place as instructed in the approved structural plans for the proposed structures. 	compaction		officer		
Impact to Fauna including aquatic Life	<ul style="list-style-type: none"> • Ensure ecological flow of water to the downstream, • Confirm the removal of vegetation to the extent possible to the project areas, • Planting of vegetation should be undertaken after the pipes are covered with soil; • Re-vegetate using indigenous tree and grass species whenever possible; • 	Evidence of ecological flow of water downstream, No of restored areas with vegetation	Report	Contract or/environment officer	-	-
Increased traffic flow with potential to cause accident	<ul style="list-style-type: none"> • Proper planning of transportation of construction materials to ensure that vehicle fills are increased in order to reduce the number of trips done or the number of vehicles on the road. • Place clear signage at the gate to alert drivers to be cautious about the construction and to look out for entering and/or exiting vehicles. • Create and designate a parking space and provide for adequate space at the turning point at proposed sites to give drivers enough room to maneuver in and out. 	<p>No of traffic signage,</p> <p>No of accidents/complaints reported</p>	Incident report	Contract or	-	-
Increased water demand and consumption	<ul style="list-style-type: none"> • reuse and recycling of water as much as possible where necessary • Conduct regular checks, inspections and maintenance of pipes, taps and storage containers and tanks to fix leakages • Sensitize the workers on water conservation • Obtain water abstraction permit where necessary and adhere to its provision 	No of water conservation measures in place	Report on water use Water permit	Propone nt, WRA, contract or		7,500 for abstraction permit

Fire hazards	<ul style="list-style-type: none"> • Availability of the Firefighting equipment on site, • Signs such as “NO SMOKING” must be prominently displayed at the site • Training workers on fire emergency response, • Formulate and enforce fire action plan, • Proper storage of flammable of materials 	No of firefighting equipment's installed No of trainings on fire emergency response	Reports	Contract or , environ ment officer	Throug hout	5, 000 on each trainee 7,000/9K g fire extinguisher
Socio- economic impacts during construction phase						
Increased prevalence of HIV/AIDS-/ STIs	<ul style="list-style-type: none"> • HIV/AIDS awareness training for all employees and subcontractors. • Sensitize the migrant workers and the local community on risky sexual behavior. • Have VCT services on site and encourage workers to undergo the same. • Develop a hiring procedure and ensure adherence to it, • Ensure the code of conduct states that sexual relations with underage children is not allowed • Develop code of conduct to be adhered to all worker, including signing it at the time of hiring, • Involve local leaders during hiring of workers, • Provision of protective devices such as condoms. 	No of sensitization trainings done, No of condoms issued	Work schem e Report	contract or, PHO	throug hout constru ction	
Increased pressure on social local amenities	<ul style="list-style-type: none"> • Toilet facilities (Portable) supplied by the contractor for the workers • All temporary/portable toilets shall be secured to the ground to prevent them toppling due to wind or any other cause. • The contractor shall ensure that the entrances to toilets are adequately screened from public view. • These facilities shall be maintained in a hygienic state and 	No of Complains registered No. of portable toilet at the site	Reports	Contract or	-	-

	<p>served regularly.</p> <ul style="list-style-type: none"> • Toilet paper, soap and hand washing facilities shall be provided, • The contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from site to an approved disposal site by licensed waste handler. • Discharge of waste from toilets into the environment and burying of waste is strictly prohibited. • Wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas, which include groundwater, are not polluted. 					
Increased spread of COVID-19, malaria and other communicable diseases	<ul style="list-style-type: none"> • Ensure the sanitary conveniences are kept clean with adequate hand wash facilities, • Use temperature guns to detect any anomaly of body temperature at the site, • Ensure workers do not crowd while at work, in the camp (at least 2m away from each other) • Workers to have their masks on all the time while in the public • Display the signs of the COVID 19 and awareness be created among workers on the same • Immediate attention to be given to workers who fall sick • Put up emergency response contracts • Keep the site orderly and clean • Abide with government Covid 19 protocols 	No of disease cases reported. No of face masks given at the site, No of legible safety precaution for COVID 19	Reports	County disease surveillance officer, Contractor and proponent	through construction	Cost will vary depending on the number of workers present
Child Labour and school drop outs	<ul style="list-style-type: none"> • Enforce laws prohibiting child labour • Educate the farmers and the students on the benefits of education • Work closely with teachers to ensure pupils and students stay in school • During construction, the contractor should adopt a 'Child 	no of incidence reported on child labour	Reports	CESSCO		

	<p>Protection code of Conduct' that all staff to the contractor should must sign, committing themselves to protecting children and ensure that appropriate disciplinary actions is taken against any staff who goes against the code of conduct and engages in any sexual crime against children.</p> <ul style="list-style-type: none"> • Ensure no children are employed on site in accordance with the national labour laws 					
Moral decadence: Alcohol and Drug abuse, prostitution, robberies	<ul style="list-style-type: none"> • The workforce should be sensitized on local and cultural practices and be educated on the expected behaviours and conducts • The contractor should prepare and implement a gender action plan to ensure that the grievance redress mechanisms are adhered to, • Contractor should use the local workforce as much as possible • Sensitize the farmers to embrace social moral principles • The local administration to enforce of law • Educate farmers and the communities on effects of drug and substance abuse • Money should be paid to bank and not cash. 	No of conflicts reported	Reports	Local administration Propone nt Contractor	Throug hout constru ction phase	-
Crime and security	<ul style="list-style-type: none"> • Work with the local administration and Nyumba Kumi initiative to enforce the law and provide security within the site in addition to the contractor's own security • Ensure that only those who work at the site are allowed to the site • Sensitize the community on how to improve security in the area • Ensure that all activities of a criminal nature on the worksite or by contractor's employees are reported to the police. • Prohibit alcohol, drugs, arms on the worksite among personnel. 	No of criminal activities reported	Reports	Local administration Propone nt Contractor	Throug hout constru ction phase	As provided for in the BQ

	<ul style="list-style-type: none"> Reasonable precautions should be put in place to prevent disorderly conducts among the contractor's workers 					
Gender Based violence, Sexual Harassment and exploitation	<ul style="list-style-type: none"> Ensure that women and minority group community members are provided opportunities to meaningfully participate in decision-making processes concerning location of services such as toilets and accommodation. Provision of gender disaggregated bathing, changing, sanitation facilities Contractor to act promptly on gender based violence employees be trained and sensitized on appropriate behavior equitable distribution of employment opportunities between gender 	No of reported cases of gender based violence,	Reports	Propone nt Contract or	Throug hout constru ction phase	
Discrimination against PLWD	<ul style="list-style-type: none"> The contractor to ensure that people with vulnerability and disability are appropriately deployed at work provide disability friendly facilities within the site for PWDs Strict disciplinary measures to be taken against those discriminating against anybody Access to the irrigation facilities to be equitable 	No of reported cases Employed staff	Reports	Propone nt Contract or	Throug hout constru ction phase	
Conflicts and vandalism	<ul style="list-style-type: none"> Explore the use of grievance redress mechanism Culprits should be apprehended and punished Capacity build the beneficiary committee to take charge 	No of reported cases	Reports	Contract or	Constr uction phase	-
Potential Archaeologic al resources	<ul style="list-style-type: none"> implement a chance find procedure (see Appendix X) and liaise with the directorate of Museum and Antiquities for safeguarding the Finds. 	No of cases recorded	Reports	Contract or	Constr uction phase	-
Environmental impacts during project operation phase						
water pollution – from surface runoff	<ul style="list-style-type: none"> Promote Integrated Pest Management (IPM) Practices incorporating crop management control techniques, biological control and restricted use of biocides in order to lessen the adverse effects of biocide use in line with BP 	No of complaints recorded, No of the water	Reports	Contract or and workers	Throug hout constru ction	-

contaminated with pesticides and fertilizer	<p>OP 4.09;</p> <ul style="list-style-type: none"> The farmers should be trained on adequate amounts of fertilizers and biocides to be used for various crops and on safe use of these chemicals; Develop Pest Management Plan for the Project, Liaise with Agrochemicals Association of Kenya to help with training in handling of agrochemicals. Erection of buffer plants at the lower edges of the farms to take up plant nutrients that may cause eutrophication to water bodies Annual Environmental Audits and Impact evaluation be done to assess the impacts of the project 	quality tests undertaken		CESSCO / ESSC		
Soil degradation-loss of soil fertility, salinization and water logging	<ul style="list-style-type: none"> It is necessary that slopes be stabilized with Napier grass planted along contours before irrigation is undertaken. Avoid encroachment and clearing of vegetation cover along R. Kabayi. Minimize and plainly define land clearing areas. 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 agro forestry, conservation tillage and contour farming. Public awareness programs should be conducted during project implementation to ensure that beneficiaries, IWUA and scheme management understand and take up their role in catchment management, and Train farmers in soil and water management to avoid land degradation. 	No of Soil Management measures at the site, No of the soil quality analysis	Reports	Farmers proponent ESSC	throughout operations	50,000 per planting season
Health and Safety Risks	<ul style="list-style-type: none"> Farmers should use personal protective gears while applying agrochemicals especially when using knapsack sprayer, Health and safety risks should be minimized by 	No of accident and incident cases reported	Reports	farmer's proponent, scheme	Continuous	15,000

	conducting farmers training on the safe and effective use and storage of chemicals and basic first aid procedures; <ul style="list-style-type: none"> • Keep agrochemical (pesticide and herbicide among others) in their original package away from reach by children and mature people as well, • Maintain Material Safety Data Sheets (MSDS) for agrochemicals for references; and • Store chemicals as recommended in the MSDS. 			management, DOSHS		
Increased traffic flow	<ul style="list-style-type: none"> • Place clear signage at the gate to alert drivers to be cautious and to look out for entering and/or exiting vehicles. • Create and designate a parking space and provide for adequate space at the turning point at sites to give drivers enough room to maneuver in and out. 	No of Traffic signage at the site, No of the reported cases of accident	Reports	Farmers	-	-
Socio-economic impacts during project operation phase						
Impacts related to occupational and public health and safety	<ul style="list-style-type: none"> • Barricade Intake area using a barbed wire, • Sensitize communities on dangers of going into the intake area • Install warning signs at dangerous areas, • provide suitable PPE and ensure they are worn, • Provide hazard notifications, signage and warnings to warn visitors and staff of potential dangers that may exist in different areas of the project, or warn the persons on potential consequences of their actions should be put in place; • Dispose wastes from the site regularly and ensure high standards of cleanliness of all waste disposal facilities. • Advice farmers and visitors to take precautions not to cause any effect on their own health or to the health of other persons. 	No. of Accident and incident cases reported	Reports	farmer's proponent, scheme management, DOSHS	Continuous	15,000
Water use	<ul style="list-style-type: none"> • Develop means to ensure equitable distribution among 	Number of cases	Reports	Farmers	WRA	

Conflicts	<p>users and monitor to assure adherence.</p> <ul style="list-style-type: none"> • The project should only abstract authorized quantity of water from the River and abide by the requires of the Water Resources Authority (WRA); • The irrigation water committee should ensure only authorized quantity of water is abstract and abide by any other conditions set by WRA; • Kabayi Irrigation Water Users Association (IWUA) should be formed. • The irrigation water committee should participate in the activities of Kabayi IWUA to ensure successful water management, apportionment and environmental protection; • The committee will be required to form strict by-laws that will guide on water usage and conflict resolution in the irrigation scheme; establish a GRM subcommittee of the IWUA, train them on conflict handling and management and resolution. • Conduct training on water saving technology to ensure efficient water use; • Install master water meter at the intake; • Install water meters at farm and household level; • Use irrigation to grow water productive crops; • Develop irrigation schedules systems to aid farmers on making decision on when to irrigation and how much water to apply. 	resolved		proponent, scheme manage ment,	IWUA	
Increase in Waterborne / Related Diseases	<ul style="list-style-type: none"> • Train farmers on household water treatment to guard against raw water use. • Train farmers on proper disposal of agro-chemical used packaging materials that can breed vectors, • Incorporate drainage infrastructure and ensure that they are well maintained. Cases of waterborne diseases, water 	Number of Reported cases	Report	IWUA	-	-

	pollution and waste disposal should be adequately addressed.					
HIV/AIDS and STIs Impacts	<ul style="list-style-type: none"> • In conjunction with the county health officers, sensitize project management committee workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and STIs. • Use of existing clinics to provide VCT services to construction crew and the scheme workers • Development of brochures and other materials that will convey information about the diseases and infections, • Regular provision of adequate prevention measures such as condoms and provision of drugs such as anti-retroviral drugs (ARVs), • Enhancing education and sensitization of workers and the local communities on the dangers and prevalence of disease, • Regular sensitization campaigns and monitoring of the spread diseases, • Access to contractor's camps by the outsiders should be strictly controlled. 	Cases of HIV/AIDS infection recorded No of Condoms given out,	Report	MoH CESSC O	-	-
Spread of COVID 19- due to increased informal laborers from different backgrounds	<ul style="list-style-type: none"> • Adhere to the Government directives on containment and control of COVID-19 such as keeping of 1.5 m distance, putting on face masks, washing hands with soap • promotion of awareness to the employees and the communities on the risks and prevention • Promote personal Hygiene especially frequent hand washing and sanitization of farm equipment • Encourage employees to go for the voluntary scanning & testing • Maintain social distance of at least 2 metres; • Comply with the government's directives for combating Covid-19 such as washing of hands, wearing of face 	No. of cases reported		(MOH), Police, PIU	Contin uous	20,000

	masks. <ul style="list-style-type: none"> • Adequate provision of PPEs • put in place means to support rapid testing of suspected Covid 19 cases 					
Child Labour and school drop outs - due to improved returns from farming	<ul style="list-style-type: none"> • Enforcement of the law prohibiting child labour • Educating the farmers and the students on the benefits of education • Having bill board indicating that people under 18 years of age are not allowed to work for pay at the farms • Enforce laws prohibiting child labour • Educate the farmers and the students on the benefits of education • Work closely with teachers to ensure pupils and students stay in school • Ensure no children are employed on site in accordance with the national labour laws 	No of child labour cases reported,	Report	local administ ration, CPCU	-	-
Moral decadence: Alcohol and Substance abuse, prostitution, robberies- due to increased income and bad influence	<ul style="list-style-type: none"> • Enforcement of law by police and the local administration • Educating farmers and the communities on effects of drug and substance abuse • Community policing to combat robberies • The workforce should be sensitized on local and cultural practices and be educated on the expected behaviours and conducts • The contractor should prepare and implement a gender action plan to ensure that the grievance redress mechanisms are adhered to, • Contractor should use the local workforce as much as possible • Sensitize the farmers to embrace social moral principles • The local administration to enforce of law • Educate farmers and the communities on effects of drug and substance abuse 	Number of cases reported	Report	local administ ration, police, farmers, CESSC O	Contin uous	-

	<ul style="list-style-type: none"> • Money should be paid to bank and not cash 					
Gender Based violence, Sexual Harassment and exploitation	<ul style="list-style-type: none"> • Ensure that women and minority group community members are provided opportunities to meaningfully participate in decision-making processes concerning location of services such as toilets and accommodation; • Liaise with local/host authorities to encourage them to participate and take an active interest in the host community's welfare; • Train committed female staff to positions of authority to create awareness of GBV/SEA. These will help promote the employment of female staff; • Provision of gender disaggregated bathing, changing, sanitation facilities if provided in the fields; • Sensitization of the community members against GBV/SH; • Whenever GBV/SH harassments are recorded on site, the community leaders should ensure prompt and effective remedial action; and • Strive for an equitable distribution of employment opportunities between men and women. 	No. of cases reported	Report	CESSCO , Farmers	Continuous	50,000
Food safety issues	<ul style="list-style-type: none"> • Proper extension service should be availed to farmers, including the World Bank due diligence on pesticides procurement, use and management, and • Observe the pre harvest timeline required after spraying produce with agrochemical. 	Number of reported cases	Report		Continuous	20,000
Family conflicts and breakups	<ul style="list-style-type: none"> • Educate the farmers on financial management • Train the community on conflict resolution mechanisms • Encourage couples to have joint bank accounts 	Number of cases reported	Report	CESSCO		-
Decommissioning Phase						
Environmental impacts during decommissioning phase						
Generation of Solid	<ul style="list-style-type: none"> • All machinery, equipment, structures, tools that cannot be reused or recycled shall be removed from site, 	No of machinery removed from	Report	CESSCO	Continuous	TBD

Waste	<ul style="list-style-type: none"> NEMA licensed waste handler will collect, transport and dispose of the demolition waste from the site, All debris/wastes to be collected regularly All waste materials from the site should be taken into approved dumping sites. Proper record of waste shall be kept including the waste transfer notes and dumbering / destruction certificate. 	the site No / Quantity of waste disposed of,				
Loss of Vegetation Cover	<ul style="list-style-type: none"> Do re-vegetation of the site to restore the site to its original status. During demolition, appropriate surface run-off controls will be undertaken to minimize erosion rates Constant monitoring 	Number of restored sites	Report	CESSC O, County Forest Officer	Continuous	TBD
Occupational Health Hazards	<ul style="list-style-type: none"> Secure all unsafe and potentially dangerous areas out of reach to community beneficiaries as well as animals by fencing and warnings posted at the site restricting access. Inspection of the demolition works to prevent accidents All persons involved in refuse collection shall be in full protective attire. All workers will be sensitized before the exercise begins, on how to control accidents related to the demolition exercise. A comprehensive contingency plan will be prepared before demolition begins, on accident response. Avail of First Aid Kit at the demolition site Adherence to safety procedures will be enforced at all stages of the exercise, All workers, pursuant to labour laws, shall be accordingly insured against accidents. All workers will be provided and instructed to wear protective attire during demolition 	No of PPEs issued, No of First Aid kit at the site No of reported incidence / accidents	Number of restored sites	CESSC O, DOSHS	Continuous	TBD
Socio-economic impacts during decommissioning phase						
Socio-	<ul style="list-style-type: none"> Diversify the community livelihoods i.e. from crop 	Number of cases	Report	CESSC		TBD

economic impact	farming to animal husbandry, • Offer advice on alternative income generating ventures to farmers and workers.	reported			Contin uous	
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7 CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

Based on the findings, it is evident that construction and operation of the proposed irrigation project will result in overall economic growth and KCSAP development objectives. More specifically the project is envisaged to increase agricultural productivity, reduce greenhouse emission and build community resilience to climate. The identified adverse potential impacts will be mitigated as recommended in the environmental social and monitoring plan.

7.2 Recommendations

The following should be observed:

- We are therefore, certain that the benefits of the project outweigh the negative impacts thus recommend this report for NEMA approval, on condition that the clients adhere to the proposed mitigation measures.
- The project to ensure that annual environmental audits be undertaken, and the project to fund the implantation of ESMMP


8 REFERENCES

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14. World Bank Group, 2014. Environmental Assessment Sourcebook Volume I (Policies, procedures, and cross- sectoral issues), Volume II (sectoral guidelines) Volume III (guidelines for Environmental assessment of energy and industry projects) *by, World Bank, Washington, Revised July 1, 2014.*

9 APPENDICES

1. Land Consent Letter for use of private land facilitated by National Land commission
2. National Land Commission Community Consultative Minutes for Kabayi Irrigation Scheme
3. ESIA Community Consultative Minutes for Kabayi Irrigation Scheme
4. Stakeholder Consultation List
5. Filled Key Informant Interview (Questionnaires administered to County Technical Members)
6. Stakeholder Questionnaires Filled (Questionnaires administered to Community Members)
7. Photo log of Public Participation
8. BOQ for the proposed project
9. Experts' NEMA registration certificates
10. Chance Find Procedures
11. KRA PIN Certificate for CGK
12. Architectural design

9.1 Appendix I: Land Consent Letter Facilitated by NLC



**OFFICE OF THE NATIONAL LAND COMMISSION COUNTY COORDINATOR
KISUMU COUNTY**

ARDHI HOUSE
P.O. BOX 1874-40100
KISUMU.

Date: 15th July, 2021.

File Ref: NLC/KSM.CTY/1/6/VOL.II (72)

✓ County Project Coordinator
Kenya Climate Smart Agriculture Project
KISUMU COUNTY.


RE: COMMUNITY IRRIGATION SCHEMES – AWACH KANO, KABAYI, SIANY CC3, CHIGA, GEM RAE AND ALUNGO.

This is in reference to your letter ref. KCSAP/KSM/ADMIN/VOL.1 (14) dated 1st July, 2021 on the above subject.

As requested by your office, National land commission took part in the Public Participation exercise as scheduled from 5th July, 2021 to 10th July, 2021, and established that;

- The County government of Kisumu is rehabilitating six community irrigation schemes namely; Awach Kano, Kabayi, Siany CC3, Chiga, Gem Rae and Alungo.
- The rehabilitation exercise involves lining of existing scheme canals with concrete in order to improve the efficiency of water flow.
- The land owners whose parcels the canals and water pipes pass through and the farmers unanimously consented to the carrying out of the project.
- The County government of Kisumu through Kenya Climate Smart Agriculture Project is not constructing new canals in any of the six schemes. They are only rehabilitating the existing ones.
- The parcels of land through which the canals and the water pipes pass are privately owned. The only public land in these schemes are road and riparian reserves.
- The effective public participation conducted helped clarify some of the concerns and manage stakeholder expectations in terms of their roles and responsibilities in the project.

Based on the above observations, the issue of compulsory acquisition is absolutely unnecessary in the six schemes.







OTIENO APPIDA.
COUNTY COORDINATOR, KISUMU COUNTY
NATIONAL LAND COMMISSION.

Copy to. The Secretary /CEO
National Land Commission
NAIROBI.

9.2 Appendix II: NLC Community Consultative Minutes for Kabayi Irrigation Scheme

REPUBLIC OF KENYA

KENYA CLIMATE SMART AGRICULTURE PROJECT – KISUMU COUNTY

MINUTES OF PUBLIC PARTICIPATION MEETING FOR THE PROPOSED KABAYI IRRIGATION SCHEME HELD ON 9TH JULY 2021 AT KAPUONJA VILLAGE, KISUMU WEST SUB-COUNTY

PARTICIPANTS

Attendance list attached

Preliminary

The meeting started with a word of prayer at 10:00a.m. Thereafter, the scheme chairperson welcomed everyone to the meeting and led members through a self-introduction session.

He then invited CESSCO to take members through the agenda of the meeting.

Agenda

1. Create awareness on the proposed project.
2. Land consent from private land owners
3. AOB

Min 01/09/07/2021-Public awareness creation on the proposed project

The farmers were taken through KCSAP overview by Mr. Vincent Odhiambo. The lead engineer also explained in detail the project scope and design.

Thereafter, the farmers raised the following concerns they foresee from the proposed project Question/concern	Response
How will the scheme structures be maintained.	Scheme management will be responsible. The Project Coordinating Unit will capacity build them on group dynamics and maintenance of the infrastructures

The time frame for the project implementation	Procurement process is still ongoing to identify contractor. Once identified, work is expected to take six months
Farmers' contribution towards the project	Farmers contribution will be in-kind.
Market availability of the agro-produce	Farmers can get market information from project information system (Kenya agricultural market information system). They were also encouraged to expand to the neighboring counties that has vegetables as priority value chains.

The farmers also requested for trainings on;

- Crop variety to be farmed within the scheme
- Governance and leadership
- General management of the scheme
- Marketing
- Financial management

Min 02/09/07/2021-Land Consent

The farmers were taken through various categories of land tenure in Kenya. It was observed that land in the scheme is privately owned. It was also noted that there are certain public lands within the scheme i.e. wetlands and the riparian areas as explained by Mr. Apida from National Lands Commission.

The farmers unanimously gave their consent to KCSAP to lay the water pipes through their land.

AOB

The farmers stated the crop variety cultivated in the scheme as maize, horticultural crops (vegetables, tomatoes & onions), sweet potatoes and cassava. They also talked of their leadership and governance structure.

Adjournment

There being no other business to transact, the chairman of the scheme gave a vote of thanks and the meeting was closed at 1.00pm with a word of prayer from one of the farmers.

Minutes signed for circulation

Name: Vincent Odhiambo Sign  Date: 10th July 2021

9.3 Appendix III: ESIA Community Consultative Minutes for Kabayi Irrigation Scheme

Date 13th January 2022, Time, 11.30am -3.00pm

Venue: Village Admins' Home at Kapunja Village, West Kisumu Ward Kisumu County.

Meeting Agendas

1. Introductions
2. Familiarization of the project by the community
3. Collection of public views and concerns in regards to the project.
4. AOB

Agenda 1

Prayer was said by one of the community member who is part of the project beneficiaries.

The meeting was chaired by the project chair from the community Mr. Peter Obisa. The chair introduced his committee members, as well as welcomed all those who had come to participate in the exercise and appreciated government officers who had shown up to support exercise, with special thanks to the sub-county admin who had pushed the project from the very beginning.

The chair then invited the village admin Mrs. Adhiambo Maigaro who also expressed her appreciation for the project and the project team

The chair in turn invited Vincent Omondo who is the project coordinator from the KCSAP, which is through the Ministry of Agriculture in the County Government of Kisumu. Vincent introduced government officers that had accompanied him to the consultation forum.

Agenda 2

Vincent introduced the project once more and explained it in details with the help of Eng. Olango who was present. He then introduced the consultants who were present to carry out the exercise from Ecofix Consultancy Ltd.

Agenda 3

On collection of public views and concerns in regards to the project, Martha Atieno was the first to speak and had the following to say;

Martha was grateful for the project saying that the project shall empower the community and improve community's livelihood. She thanked everyone who had participated in enabling the project come as far as it has and expressed hope that she will now be able to easily raise money through the project to pay school fees from the proceeds; and asked for those concerned to hasten the process so that they can realize this benefit as soon as possible.

Washington Kabuya from Sinyolo village on his part noted that the project shall stabilize water availability for farmers both in season and out of season. He stated that the project shall help cushion the impact of climate change in the area especially during drought.

Oliver Ongei from Rabwor village on his part stated that the project shall be a blessing to the area since it shall enable the community to produce agricultural produce and sell throughout the year hence the community shall be empowered economically year round even within the framework of the climate change challenge.

Charles Dada of Sianda village contributed to the meeting by saying that because the project shall come with a training package to the community, the knowledge transfers to the community especially the youth shall be an asset to the community and enable them to produce even better and for longer. He too noted that the project shall provide employment opportunity to the community and especially to the youths.

Glades Adhiambo who is a childless widow beneficiary of the project from Rabwor village informed the meeting that she has tried rain fed farming for years in the area, but she has always been disappointed due to the prevailing climate change challenge. She therefore appreciated the project saying that her efforts won't go to waste again for the project is bound to stabilize her farming effort.

Stephen Okoth on his part said that the area has had a flooding challenge for many years especially during the rainy season and at the same the local river shrinks into a small stream during dry season. He therefore asked the project designers to help address the flooding that dominates the area during rainy season and also the low water level during the dry season through the project design.

John Barak from Rabwor Village said that he has been in the area since 1963 and has seen the area transform over time. He therefore thanked Kenya Climate Smart Agriculture project for choosing the project in the area to their benefit and urged locals who are beneficiaries to the project to work in groups to benefit better to benefit from the project. He said that in groups the community shall have a bargaining power in terms of farm inputs, supply of labor and in sourcing for markets for their produce. Barak too noted that security and especially theft of farm produce has been an issue in the area over time and asked the community to unit and fight the vice in their midst. He insisted that if the community will reap hefty benefits if they worked together and even have a chance to benefit from the Kisumu International Airport with is within their proximity.

Mary Ohinga thanked the Sub-County admin for coming to be with them in the meeting and for the relentless efforts he has made to ensure that the project comes to be. He however noted that river banks of the river that the project depends on usually collapse during the rainy season. He therefore urged the project to address that challenge. He too asked the county through the Sub-County to go further and support the project through provision of farm inputs to include both vegetable and tree seedlings.

On her part, Christine Akoth cried out that vegetables are drying out in her farm for she is not in position to water or irrigate them at the moment. He therefore urged that she will be very grateful she

will do better with availability of water supply and urged the project planners to hasten the process to allow the project work.

George Onange of Sianda Village informed the meeting that Kabayi area was divided into two and part of Kabayi was a swamp. He urged fellow farmers to focus their energy on using non sensitive ecosystem and avoid sensitive area that is swampy. He too urged fellow farmers and the project at large to ensure that every material used in the area is environmental friendly to avoid impacting on the swamps. George also insisted that Kabayi is a great area place is it well taken care of apart from the times when it floods and destroy crops. He too applauded the previous irrigation project in the area though he claimed that part of the target area missed out due to lack of pipes.

George Onaya asked the community especially youths to empress farming and takes it with the seriousness it deserves. He also urged the community to divide themselves into specialized groups where each group takes and focuses on growing a particular crop to gain maximum output out of their activity as it has been proven to work elsewhere in the country.

Mr. Osendo Paul Odera who is also a retired paramount chief and currently a large scale farmer in the area applauded the Sub-county admin for his relentless effort in ensuring that the project come to be. The former chief applauded the project and said that the project shall spur development in the area.

Kennedy Omondi (youth) was interested to know how the youths shall participate and take part in the project since most of those present were adults and elderly persons.

Martha from Kabayi to thanked the proposed project for the area and said it shall develop the area and create employment. She however raised concerns about the following;

- Land take by pipes and tanks
- Management of raising conflicts
- Pumping energy such as solar and diesel generators and their side impacts such as noise pollution, emissions etc.

















Mr. Alpolo Ogalo a resident from Sianda Village also raised the same concerns as what had been raised by Maerha. He stated that the initial irrigation project in the area had a challenge since some members did refuse to allow pipes to pass through their land and was asking members not to do the same but to allow easy implementation of the project. In responding to the concerns, the project engineer confirmed that water shall be transported through gravity according to the design and not generators

The project chair confirmed that they already have prior agreements and issues of land take had been addressed.

The meeting was closed at 3.30pm with prayers from Pamela Okolo.

By Gideon Mwendwa

9.4 Appendix IV: Stakeholder Consultation List

 							
We fix it, you live it		Kenya Climate Smart Agriculture Project (KCSAP)					
		KISUMU CPCU					
ACTIVITY: <u>ESIA CONSULTATIVE MEETING FOR KABAYI IRRIGATION PROJECT</u>							
VENUE: <u>VILLAGE ADMINI HOME</u>		DATE: <u>13/01/2022</u>					
ATTENDANCE LIST							
S/NO	NAME	GENDER	ORGANIZATION	DESIGNATION	TELEPHONE	EMAIL ADDRESS	SIGN
1	Peter Obiso	M	Kabai	Chairman	0729482245		
2	Washington Kazuya	M	"	C-Member	0720460746		
3	Ndolo Joshua Ngala	M	"	Member	0716131766		
4	WALTER ODEDE OTOL	M	KABAI	MEMBER	0721937775	otopodade@gmail.com	
5	VICTOR ONYANGO	M	"	M	0718222229	-	
6	JACOB D. ROMBO	M	"	MEMBER	0717367408		
7	MICHAEL O. OBARO	M	"	MEMBER	0722470119		
8	ANNAH A. WASONGO	F	"	member	0729850973		
9	JOHN D. ROMBO	M	"	member	0728347152		
10	CHIESO D. ROMBO	M	"	"	"		
11	DAVID OUMA AGOLA	M	"	"			
12	MOSES OTIATIO	M	"	"	0716454636		
13	ONTAGE JOHAN	M	"	"	076828047		
14	MICHAEL OTIENO OKOYO	M	"	"	0700789544		

S/NO	NAME	GENDER	ORGANIZATION	DESIGNATION	TELEPHONE	EMAIL ADDRESS	SIGN
15	Charles O Owino	M	"	"	079286230		CH
	CHRISTINE AKOIH	F	"	"	0725295128		CA
16	PAMELA OCHIENG	F	"	"	0715262496		W
17	CELESTINE AWINO	F	"	"	0714993915		CE
18	JOIS ONYANGO	F	"	"	0716124715		JO
19	TERESA OTIENO	F	"	"	0705085140		OT
20	MARINE ADIRIMBO	F	"	"	0704906040		MA
21	MICHAEL OWOOR	M	"	"	0729556384		MO
22	JEREMIAH OGOLLA	F	"	"	0728707804		JO
23	PAMELA OKOLO	M	"	"	0704167456		PO
24	DUMA CHARLES	M	"	"	0717892950		DC
25	MARY OJINGA	F	"	"	0717520857		EO
26	JERRY SUNDI AKOMBI	M	"	"	0721961244		JS
27	Flora Omba	F	"	"	0729875387		FO
28	Linda Omba	F	"	"	071254447		LO



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Kenya Climate Smart Agriculture Project (KCSAP)

KISUMU CPCU



Kenya Climate Smart
Agriculture Project









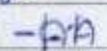
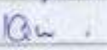

ACTIVITY: ESIA CONSULTATIVE MEETING FOR KABAYI IRRIGATION PROJECT

VENUE: Village Admin's Home, KABUNGA VILLAGE




DATE: 13/01/2022

ATTENDANCE LIST

S/NO	NAME	GENDER	ORGANIZATION	DESIGNATION	TELEPHONE	EMAIL ADDRESS	SIGN
1	REGINALD OLANG	M	CCTK-WATER (KCSAP)	ENGINEER	072271358	reginald_olang@yahoo.com	
2	FREDRICK OKUDO	M	KABAYI PROJECT SECRETARY	SECRETARY	0720450310	fred.okudo@gmail.com	
3	RUTH OLIHAMBIA	F	II	Member	0707119965	13 Karajaballi	
4	JANE AWOROR	F	II	Treasurer	0726849316	13 DM	
5	MARGARET A OLIHAMBIA	F	CCTK Village Adh	Administrator	072324326	Margaret Oliambia@gmail.com	
6	JANE ATIN ASIKA	F	Farmer	Farmer	0790597425	"	
7	GLADIS NJERI GACHUKI	F	Farmer	Farmer	0723266155	"	
8	RODGONDA OSENDA	F	Farmer	Member	0717749124	"	
9	PAUL OSENDA ODIKA	M	Farmer	Member	0750570594	"	
10	FRANCIS AGIEKO MUO	M	KWUA	Co-ordinator	0723865793	mucorastus@gmail.com	
11	NICHOLAS OMANDI	M	Farmer	Member	0716291494	"	
12	OLIVER ONGET	M	Farmer	Member	073442243	oliveromongo@gmail.com	
13	CHABIS STENO OLLA	M	Farmer	Member	0759215035	"	
14	PAUL ADUOGO	M	Farmer	Member	0709128969	"	

S/NO	NAME	GENDER	ORGANIZATION	DESIGNATION	TELEPHONE	EMAIL ADDRESS	SIGN
15	KEITHLEY OMONDI OUMA	M	MORINGA FA		0729545756		
16	Wycliffe Ouma	M	Moringa FA		0798812359	wycliffe.ouma@gmail.com	
17	CHARLES DADA	M	MORINGA FA		07143102135	Charlesdada937@gmail.com	
18	GEORGE DNAYA	M	MORINGA FA		0727208713		
19	STEPHEN OKOTH	M	KABAYI		0739574148		
20	MARTHA AKICH DOK	F	KABAYI		0720324491		
21	DEWILLY A. DOK	F	KABAYI		0723793268		
22	CLARIS A. SKETCH	F	KABAYI				
23	LUCIA ONOKA				0702578197		
24	MARGARET WAGA	F	KABAYI		07452514574		
25	JACKLINE A. DNAYA	F	KABAYI		0751919053		
26	JOSIANA A. ODHAMBO	F	KABAYI		0719126903		
27	ALICE DOK	F	Kabayi		071163831		
28	ADRIAN OGALE	M	Kabayi		0717751253		

9.5 Appendix V: Filled Key Informant Interview

KEY INFORMANT INTERVIEW

Pursuant to the provision of the Environmental Management and coordination Act, 2015 and the Environmental Impact Assessment and Audit Regulations 2003 and in pursuance of sustainability and harmony, we kindly request for your views, opinions and recommendations regarding the proposed Rehabilitation of Kabayi Irrigation Scheme Project.

Land ownership status

1. Who owns the land where the proposed project is to be done?
 - a. Community
 - b. Government
 - c. Faith Based Organization
 - ☒ d. Others (Specify) Private
2. Documentation available (Attach evidence)
 - A. Title Deed
 - B. Allotment by Government
 - C. Allotment by County
 - D. None

land consent minutes / consensus letter per NAC to court
3. If yes, what is the LR number?
4. What is the size of the land (acreage) 62 Hrs
5. Is there any other parcel of land the client owns apart from the one above? W/A
6. If Yes tick the appropriate size (acreage) and comment on the above
7. Any form of Encumbrances (Caveat, Collateral, Charge etc.) None
8. Are there any cases of encroachment?
 - a. Yes
 - ☒ b. No
9. What is the nature of encroachment
 - a. Client encroached community land
 - b. Community encroached into client land

W/A
10. What is the level of impact of the encroachment?
 - a. Reduction of client land
 - b. Reduction of land for proposed development
 - c. Alteration of the landscape
 - d. Illegal exploitation of client resources
 - e. Interference of clients normal operations
 - f. Behavior change (psychosocial issues)
 - g. Conflict and tensions

W/A
11. What has informed the development of this proposed project?

The changes in climate which has affected crop production
12. What **POSITIVE** socio-economic and environmental impacts do you anticipate from the proposed project?

Increased land productivity

Farm security

P.O. Box 1376-30200, Kitale | Tel: +254 790334886/711850057 | E-mail: ecofixconsultancy@gmail.com | website: www.ecofixconsultancy.com



13. What **NEGATIVE** socio-economic and environmental impacts do you anticipate from the proposed project? Please tick below on expected negative impacts to existing environmental conditions and other considerations such as pollution to traffic, water, air, noise, dust, solid waste and health in relation to the proposed project.

☒ work injuries ☒ Traffic & Elderly land use
☒ Water use conflicts ☒ conflicts
☒ Poor road




14. Make suggestions on the Mitigation Measures for the impact stated above

☒ PPE use and consultation
☒ Water use planning
☒ Traffic road department
☒ Collection scheme planning

Name: Ken. Kiprotich
 Position/office: Environmental Desk
 Tel Contact: 0724622507
 Address: 197-45100
 Date: 13/01/2012

Signature: Kiprotich

9.6 Appendix VI: Sample field filled questionnaires

Environment and Social Impact Assessment (ESIA) Checklist




This questionnaire is an E&S tool for collecting information. We request you to contribute any information that would help in providing proper guideline in the project. This information will help us prepare ESIA for the Rehabilitation of Kabayi Irrigation Scheme from an informed perspective of the projects' environment, social, health and safety requirements. All information given in this questionnaire will be treated as **CONFIDENTIAL**.

Name: Charles Omondi Gender: ☒ M ☐ F Age: 50

Phone No: 0759245035 Id No: 1055868

- How many Villages are within the project implementation area (List the names of all Villages)
 - Sianda Village
 - Falim Village
 - Shupile Village
 -
 -
- How many people will benefit from this project both directly and indirectly
 Directly: Villagers Indirectly: Staffs from the Area
- Identify some of the community water source around the project vicinity?
Bore holes
Rivers
- State the direct benefits with this irrigation project?
 - Jobs among community members
 - Food Safety
 - Money Circulation
 - Clean water
- How will the irrigation project alter your farming patterns?
The area 7 & 8
- List the potential impacts from the proposed irrigation scheme?
Will create jobs and food among the members
- List some of the environmentally sensitive areas (e.g. intact natural forests, mangroves, wetlands, critical habitats) or threatened species within or near the proposed project?
The good for Agriculture only
- Elaborate how the proposed project will interfere with the ecosystem of the area?
Close 7 the Agriculture seasons
- What are the mitigations measures for impacts on ecosystem services degradation associated with the project?
There will be minimal use of chemicals

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10. What are some of the social evils associated with the proposed irrigation project?
 - Theft
 - Conflicts among the members

11. Who are known members of the vulnerable and marginalized group within the project zone of influence?
 N/A

12. Elaborate the known grievance redress mechanisms through which you community member may raise grievances related to project implementation and community complaints?
 - Area Chiefs
 - Community members
 Elaborate some of the notable forms of gender parity and GBV that may arise due to the implementation of the proposed irrigation project.
 - Separation within the family member
 - wife Husband separation

13. List some of the pesticides you use to control pests (insects, diseases, weeds) of crops each season?
 Drawler

14. Name some of the possible diseases associated with the proposed project and how do you intend to prevent the anticipated diseases?
 N/A

15. How do you decide when to use the pesticides (tick all that apply)?
☒ (i) We use pesticides at regular intervals throughout the season (calendar)
☒ (ii) We use pesticides when we see pests in the field (control)
☐ (iii) We use pesticides after field sampling and finding a certain number of pests or a certain level of damage (scouting)
☐ (iv) Told by someone to apply (specify who) N/A
☐ (v) Other (specify) _____

16. What are some of the safety measures you use when applying pesticides and agricultural chemicals?
 - Gum boots

17. What size of land will be used put under irrigation?
 62 Ha

18. What are some of the cultural heritage sites within the project zone of influence?
 N/A

19. Identify any other environment, social, health and safety issue(s) associated with the project?
 Land issue

Thank you for taking your time to do the survey we highly appreciate your contribution.

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Environment and Social Impact Assessment (ESIA) Checklist

This questionnaire is an E&S tool for collecting information. We request you to contribute any information that would help in providing proper guideline in the project. This information will help us prepare ESIA for the Rehabilitation of Kabayi Irrigation Scheme from an informed perspective of the projects' environment, social, health and safety requirements. All information given in this questionnaire will be treated as **CONFIDENTIAL**.

Name: Mrs. Radgwinda Ojendo Gender: ☐ M ☒ F Age: 72
Phone No: 0717749124 Id No: 1607159

1. How many Villages are within the project implementation area (List the names of all Villages)

- a. Shunda Village
- b. Gupilo Village
- c. Rabon Village
- d.
- e.

2. How many people will benefit from this project both directly and indirectly

Directly: Villagers Indirectly: Staffs from other bodies

3. Identify some of the community water source around the project vicinity?

Bombulus Rivers and water pans

4. State the direct benefits with this irrigation project?

- i. Creation of Jobs
- ii. Food safety
- iii. Money circulation
- iv. Clean water

5. How will the irrigation project alter your farming patterns?

The size of the land may be too big

6. List the potential impacts from the proposed irrigation scheme?

Jobs and food in the family

7. List some of the environmentally sensitive areas (e.g. intact natural forests, mangroves, wetlands, critical habitats) or threatened species within or near the proposed project?

good for Agricultural lands




8. Elaborate how the proposed project will interfere with the ecosystem of the area?

Change of the Agricultural System

9. What are the mitigations measures for impacts on ecosystem services degradation associated with the project?

There will be minimal in 7 channels in the land

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10. What are some of the social evils associated with the proposed irrigation project?
Thief & Corruption

11. Who are known members of the vulnerable and marginalized group within the project zone of influence?
N/A

12. Elaborate the known grievance redress mechanisms through which you community member may raise grievances related to project implementation and community complaints?
Area Chief - Community Elaborate some of the notable forms of gender parity and GBV that may arise due to the implementation of the proposed irrigation project.
Wife Inland Separation

13. List some of the pesticides you use to control pests (insects, diseases, weeds) of crops each season?
Diazi

14. Name some of the possible diseases associated with the proposed project and how do you intend to prevent the anticipated diseases?
N/A

15. How do you decide when to use the pesticides (tick all that apply)?
☒ (i) We use pesticides at regular intervals throughout the season (calendar)
☒ (ii) We use pesticides when we see pests in the field (control)
☒ (iii) We use pesticides after field sampling and finding a certain number of pests or a certain level of damage (scouting)
☐ (iv) Told by someone to apply (specify who) _____
☐ (v) Other (specify) _____

16. What are some of the safety measures you use when applying pesticides and agricultural chemicals?
Safety clothes

17. What size of land will be used put under irrigation?
62 Ha

18. What are some of the cultural heritage sites within the project zone of influence?
N/A

19. Identify any other environment, social, health and safety issue(s) associated with the project?
Low 2 ISS

Thank you for taking your time to do the survey we highly appreciate your contribution.

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9.7 Appendix VII: Photo Log of public participation

Chairman addressing the community members



KCSAP staff addressing community



Youth airing out his views

9.8 Appendix VIII: BOQ for the Proposed project

The project cost below includes both the community and county government contribution in order to implement Kabayi small scale irrigation scheme and auxiliary structures.

No.	Activity	Budget Item	Unit	No.	Unit Cost	Total Cost	Community Contribution	20% County contribution	KCSAP Grant	Total Amount
1	Preliminaries and the generals	Site office, material testing and billboards	No.	1	500,000	500,000	0	0	500,000	500,000
		Bush clearing	No.	1	150,000	150,000	0	0	150,000	150,000
2	Tower and water tanks	Construct tower and Supply and fix water tanks	Man days	3	720,000	2,160,000	0	0	2,160,000	2,160,000
3	Pumping set	Supply and fix solar pumps	No.	6	300,000	1,800,000	0	0	1,800,000	1,800,000
4	Conveyance	Pipe works	No.	1	3,000,000	3,000,000	0	0	3,000,000	3,000,000
5	Spring protection	Construction and Pipe works	No.	1	2,200,000	2,200,000	0	0	2,200,000	2,200,000
7	Hydrant construction	Construction	No.	16	20,000	320,000	0	-	320,000	320,000.00
8	Cattle and Small Animals watering trough	Construction	No.	2	220,000	440,000			440,000	440,000.00
9	VIP toilet	Construction	No.	1	500,000	500,000			500,000	500,000.00
10	Demonstration Net house	Construction	No.	1	600,000	600,000			600,000	600,000.00

No.	Activity	Budget Item	Unit	No.	Unit Cost	Total Cost	Community Contribution	20% County contribution	KCSAP Grant	Total Amount
11	Opening of scheme feeder road	Grading, murraming and box culverts	No.	1	2,000,000	2,000,000	0	2,000,000.00	0	2,000,000.00
12	Pipe network	Excavation	Man days	2900	500	1,450,000	1,450,000.00	-	0	1,450,000.00
13	EMP	Implementation of EMP		1	1	1	0	-	360,000	360,000.00
	Total Project Cost						1,450,000.00	2,000,000.00	12,030,000.00	15,480,000.00
	Community contribution:									1,450,000.00
	County Contribution									2,000,000.00
	Total KCSAP grant applied for:⁽¹⁾									12,030,000.00

- Community members will be working at the project site excavating canals, moving building materials to the site, storing materials and providing security to the project site and materials.

9.9 Appendix IX: NEMA Expert License

FORM 7 (r.15(2))



nema
mazingira yetu | uhali wetu | wajibu wetu

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/15059
Application Reference No: NEMA/EIA/EL/19802

M/S **ECOFIX CONSULTANCY LIMITED**
(individual or firm) of address
P.O. Box 1376-30200, Kitale

is licensed to practice in the
capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts**
registration number **7912**

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

Issued Date: **5/17/2021** Expiry Date: **12/31/2021**

Signature..... 

(Seal)
Director General
The National Environment Management Authority

P.T.O.




9.10 Appendix X: Chance Find Procedures

Chance find procedures will be used as follows:

- a. Encounter or detection of a PCR
- b. Stop the construction activities in the area of the chance find;
- c. Delineate the discovered site or area;
- d. Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and the Directorate of Antiquities Sites and Monuments take over;
- e. Notify the supervisory Engineer who in turn will notify the responsible local authorities and the Directorate of Antiquities Sites and Monuments (within 24 hours or less);
- f. The Directorate of Antiquities Sites and Monuments would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the Directorate of Antiquities Sites and Monuments (within 24 hours). The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
- g. Decisions on how to handle the finding shall be taken by the Directorate of Antiquities Sites and Monuments. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;
- h. Implementation for the authority decision concerning the management of the finding shall be communicated in writing by the Directorate of Antiquities Sites and Monuments; and
- i. These procedures must be referred to as standard provisions in construction contracts, when applicable. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered are observed;
- j. Construction work will resume only after authorization is given by the responsible local authorities and the National Museum concerning the safeguard of the heritage; and
- k. Relevant findings will be recorded in World Bank Implementation Supervision Reports (ISRs), and Implementation Completion Reports (ICRs) will assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.

9.11 Appendix XI: KRA PIN Certificate for County Government of Kisumu

 KENYA REVENUE AUTHORITY www.kra.go.ke	PIN Certificate	For General Tax Questions Contact KRA Call Centre Tel: +254 (020) 4999 999 Cell: +254(0711)099 999 Email: callcentre@kra.go.ke		
		Certificate Date : 06/08/2017 Personal Identification Number P051419190U		
This is to certify that taxpayer shown herein has been registered with Kenya Revenue Authority				
Taxpayer Information				
Taxpayer Name	KISUMU COUNTY			
Email Address	TREASURY@KISUMU.GO.KE			
Registered Address				
L.R. Number :	Building PROSPERITY HOUSE			
Street/Road KENYATTA HIGHWAY	City/Town : KISUMU			
County : Kisumu	District Kisumu East District			
Tax Area Kisumu CBD	Station PUBLIC SECTOR DIVISION			
P. O. Box 2738	Postal Code 40100			
Tax Obligation(s) Registration				
Sr. No.	Tax Obligation(s)	Effective From Date	Effective Till	Status
1	Value Added Tax (VAT)	21/03/2019	31/12/2029	Dormant
2	Income Tax - Company	01/09/2010	N.A.	Active
3	Income Tax - PAYE	01/09/2014	N.A.	Active
<p>The above PIN must appear on all your tax invoices and correspondences with Kenya Revenue Authority. Your accounting end month is December unless a change has been approved by the Commissioner-Domestic Taxes Department. The status of Tax Obligation(s) with 'Dormant' status will automatically change to 'Active' on date mentioned in "Effective Till Date" or any transaction done during the period. This certificate shall remain in force till further updated.</p>				
Disclaimer : This is a system generated certificate and does not require signature.				

9.12 Appendix XII: ESS Screening Checklist.

ANNEX 10: ENVIRONMENTAL AND SOCIAL SCREENING CHECK LIST

(Sub-projects screening process by benefitting communities/Agencies)

Section A: Background information

Name of County.....	KISUMU
Name of CPCU/Monitoring Officer/Researcher.....	VINCENT DADIAMBO
Sub-project location.....	KISUMU WEST SUB-COUNTY
Name of CBO/Institution.....	KABAYI IRRIGATION SCHEME CBO
Postal Address:.....	
Contact Person.....	Cell phone:.....
Sub-project name.....	KABAYI SMALL SCALE IRRIGATION SCHEME
Estimated cost (KShs.).....	15,480,000/-
Approximate size of land area available for the sub-project.....	6.5 Ha
Objectives of the sub project.....	- Avail. Water for irrigated farming.....
Activities/enterprises undertaken.....	Crop production.....
How was the sub-project chosen?.....	C.B.P., public participation
Expected sub project duration:.....	6 months

Section B: Environmental Issues

Will the sub-project:	Yes	No
Create a risk of increased soil erosion?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Create a risk of increased deforestation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Create a risk of increasing any other soil degradation soil degradation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Affect soil salinity and alkalinity?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Divert the water resource from its natural course/location?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cause pollution of aquatic ecosystems by sedimentation and agro-chemicals, oil spillage, effluents, etc.?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Introduce exotic plants or animals?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Involve drainage of wetlands or other permanently flooded areas?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cause poor water drainage and increase the risk of water-related diseases such as malaria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Reduce the quantity of water for the downstream users?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Result in the lowering of groundwater level or depletion of groundwater?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Create waste that could adversely affect local soils, vegetation, rivers and streams or groundwater?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reduce various types of livestock production?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Affect any watershed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Focus on Biomass/Bio-fuel energy generation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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

Section C: Socio-economic Issues

Will the sub-project:	Yes	No
Displace people from their current settlement?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Interfere with the normal health and safety of the worker/employee?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reduce the employment opportunities for the surrounding communities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reduce settlement (no further area allocated to settlements)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reduce income for the local communities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Increase insecurity due to introduction of the project?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Increase exposure of the community to HIV/AIDS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Induce conflict?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Have machinery and/or equipment installed for value addition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Introduce new practices and habits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lead to child delinquency (school drop-outs, child abuse, child labour, etc.)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lead to gender disparity?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lead to poor diets?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lead to social evils (drug abuse, excessive alcohol consumption, crime, etc.)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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

Section D: Natural Habitats

Will the sub-project:		
Be located within or near environmentally sensitive areas (e.g. intact natural forests, mangroves, wetlands) or threatened species?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Adversely affect environmentally sensitive areas or critical habitats – wetlands, woodlots, natural forests, rivers, etc.)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Affect the indigenous biodiversity (Flora and fauna)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cause any loss or degradation of any natural habitats, either directly (through project works) or indirectly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Affect the aesthetic quality of the landscape?	<input checked="" type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input type="checkbox"/>
Will the sub-project:		
Involve the use of pesticides or other agricultural chemicals, or increase existing use?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cause contamination of watercourses by chemicals and pesticides?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cause contamination of soil by agrochemicals and pesticides?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Experience effluent and/or emissions discharge?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Export produce? Involve annual inspections of the producers and unannounced inspections?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Require scheduled chemical applications?	<input checked="" 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 checked="" type="checkbox"/>	<input type="checkbox"/>
Use irrigation system in its implementation?	Yes	

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

Section E: Pesticides and Agricultural Chemicals

This questionnaire will be used with the farmers groups for purpose of implementing the IPMF

1) Pest Control practices

a) Do you use any pesticides to control pests (Insects, diseases, weeds) of crops each season?

Yes <input checked="" type="checkbox"/> No If yes, name them:	Name of pesticide	Name of pest, disease, weed controlled	Number of times applied/ season	When did you apply (growth stage or month) Quantity purchased

If No, WHY?

b) If you use any of the above pesticide types, do you keep records of the:

Application location Yes..... No ☒

Date of application Yes..... No ✓

Pesticide product trade name

Yes..... No ✓

Operator name Yes..... No ✓

If No, WHY? Illiteracy

c) How do you decide when to use the pesticides (tick all that apply)?

(i) We use pesticides at regular intervals throughout the season (calendar)

(ii) We use pesticides when we see pests in the field (control)

(iii) We use pesticides after field sampling and finding a certain number of pests or a certain level of damage (scouting)

(iv) Told by someone to apply (specify who) _____

(v) Other (specify) _____

d) Do you use a knapsack sprayer? Yes ✓ No ____

If yes,

(i) Do you own it Yes ✓ No ____

(ii) Do you rent it Yes _____ No ____

(iii) Do you borrow it Yes _____ No ____

e) From your experience, are there any negative/harmful effects of using pesticides?

Yes ✓ No _____

f) If yes, list the negative effects:

(i) Chest pain

(ii) Nausea

(iii) Headache

(iv) _____

(v) _____

g) Do you use any kind of protective clothing while applying or handling pesticides? Yes ✓ No ____
Why? ____

a) If YES, what kind? goggles, gloves

2. Knowledge of pesticide handling and storage (tick one in each row)

a) Do you read labels on the pesticide container before using?

Sometimes ✓ Always _____ Never _____

b) How often do you wear protective clothing and other accessories like nasal mask, eye goggles, and boots when applying the pesticides?

Sometimes ✓ Always _____ Never _____

c) Do you mix pesticides with your hands?

Sometimes ✓ Always _____ Never _____

d) Do you observe the pre-harvest waiting periods after applying the pesticides?

- Sometimes ✓ Always _____ Never _____
- e) After spraying, do you wait 12 hours before entering the field?
 Sometimes ✓ Always _____ Never _____
- f) Do you store pesticides in a secure, sound and well-ventilated location?
 Sometimes ✓ Always _____ Never _____
- g) Do you make a cocktail before applying the pesticides? (i.e., mix more than one chemical and apply them at once?)
 Sometimes ✓ Always _____ Never _____
- h) Where do you store your pesticides? house
 Why do you store them there?
lack of proper store
- i) What do you do with your pesticide containers after they are empty? dispose in toilets
- j) Do you know of any beneficial insects (insects that eat harmful insects)?
 Yes..... No ✓.....
- k) If yes, name them:
 i) _____ ii) _____ iii) _____

3. Pesticides and Health

- a) Do you find that pesticide application is affecting the health of: Persons regularly applying pesticides?
 Sometimes ✓ Always _____ Never _____
- Persons working in fields sprayed with pesticides
 Sometimes ✓ Always _____ Never _____
- Persons harvesting the produce
 Sometimes ✓ Always _____ Never _____

4. Options to Pesticides

- a) From your experience, are you aware of other methods for controlling insect's diseases and/or weeds besides pesticides?
 Yes ✓..... No
- b) If yes, describe these practices:
 i) _____ ii) _____ iii) _____ iv) _____

5. Information

- a) What information do you think you need for improving your crop production and marketing?
Times

6. Training

- a) Have you ever received any training on any of the following topics related to crop production?
- b) Integrated Pest Management Yes..... No ☒
- c) No. of times/past yr.
- d) b).Pesticide Usage Yes..... No ☒
- e) No. of times/past yr.
- f) Pesticide Safety Yes..... No ☒
- g) No. of times/past yr.
- h) Insect Identification Yes..... No ☒
- i) No. of times/past yr.
- j) Disease Identification Yes..... No ☒
- k) No. of times/past yr.
- l) Quality aspects of production Yes..... No ☒
- m) No. of times/past yr.....

7) Is there anything else that you want us to know about your crop production?

Value addition & marketing

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

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

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

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

Section G: Land Acquisition and Access to Resources

Will the sub-project:	Yes	No
Require that land (public or private) be acquired (temporarily or permanently) for its development?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Section H: Proposed action

(i) Summarize the above:	(ii) Guidance
<input type="checkbox"/> All the above answers are 'No' <input checked="" type="checkbox"/> There is at least one 'Yes'	<ul style="list-style-type: none">• If all the above answers are 'No', there is no need for further action;• If there is at least one 'Yes', please describe your recommended course of action (see below).

(iii) Recommended Course of Action

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

☐ CPCUs and County Director of Environment (CDE) will provide detailed guidance on mitigation measures as outlined in the ESMF; and

☒ Specific advice is required from CDE and CPCUs regarding sub-project specific EIA(s) and also in the following area(s)

☐ All sub-project applications/proposals MUST include a completed ESMF checklist. The KCSAP-CPCU and CDE will review the sub-project applications/proposals and the CDEs will sign off;

☐ The proposals will then be submitted to KCSAP PIU for clearance for implementation by communities in the proposed subprojects.

Expert Advice

Recommends SPR

☐ The National Government through the Department of Monuments and Sites of the National Museums of Kenya can assist in identifying and, mapping of monuments and

archaeological sites; and

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

Completed by: [type here]

Name: [type here]

Position / Community: [type here]

Date: [type here]



Field Appraisal Officer (CDE): [type here]

Signature: [Signature]

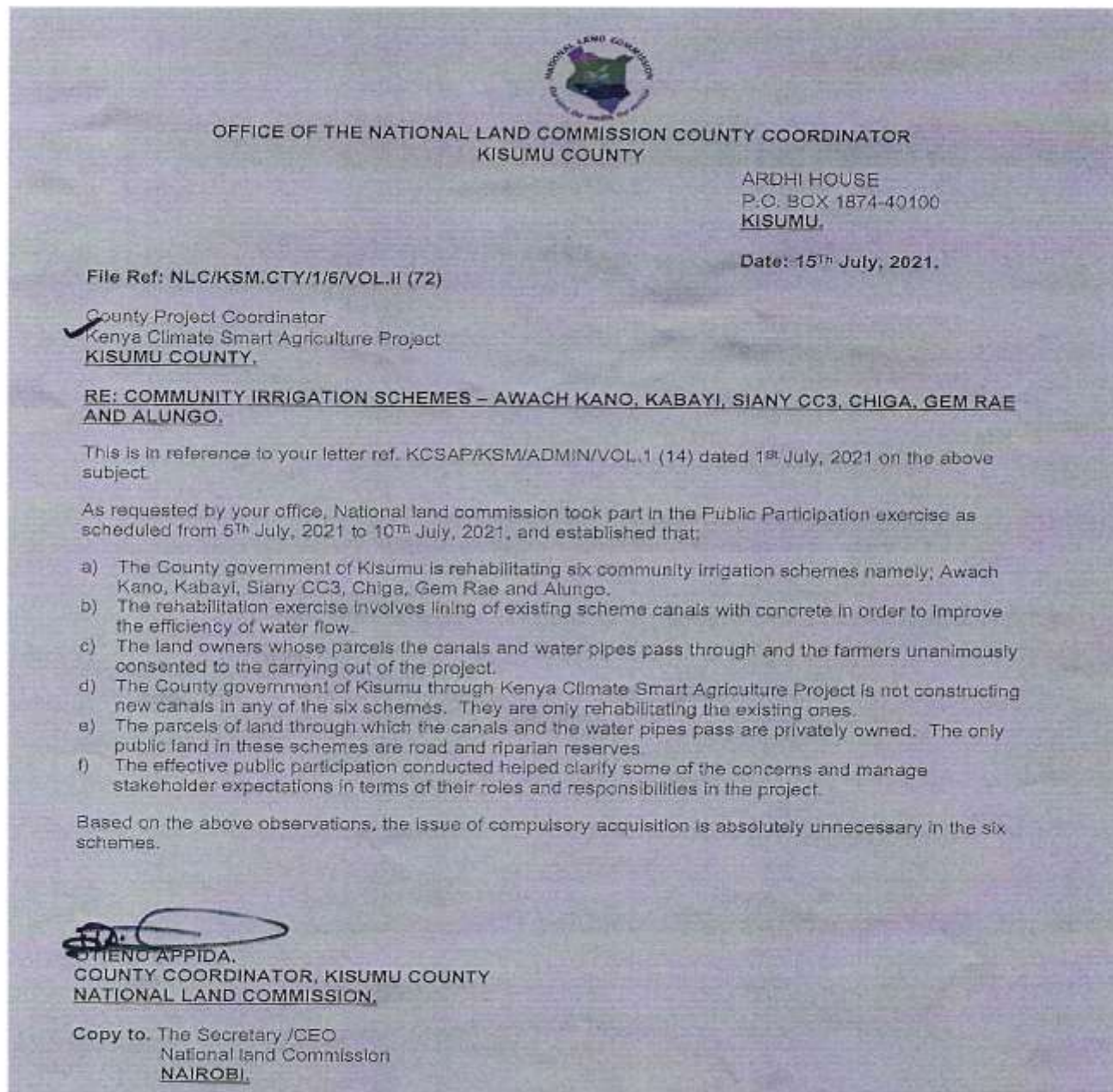
Date: [type here]

17th Mar 21

Note:

Project category	Characteristics
A	Full and extensive EIA needed- irreversible environmental impacts; impacts not easy to pick or isolate and mitigation cost expensive; EMP 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 EMP design readily done; need an EIA and future EAs
C	Have minimal or occasionally NO adverse environmental impacts; exempted from further environmental processes save environmental audits

9.13 Appendix XIII: National Lands Commission Concurrence letter to undertake the Investment.



	
Brief Introductory meeting	Reconnaissance Team at the Site
	
Existing intake pipeline near the main intake	Proposed R. Kabayi Intake point

Figure 4. Reconnaissance meeting and site inspection

KABAI IRRIGATION PROJECT 65HA

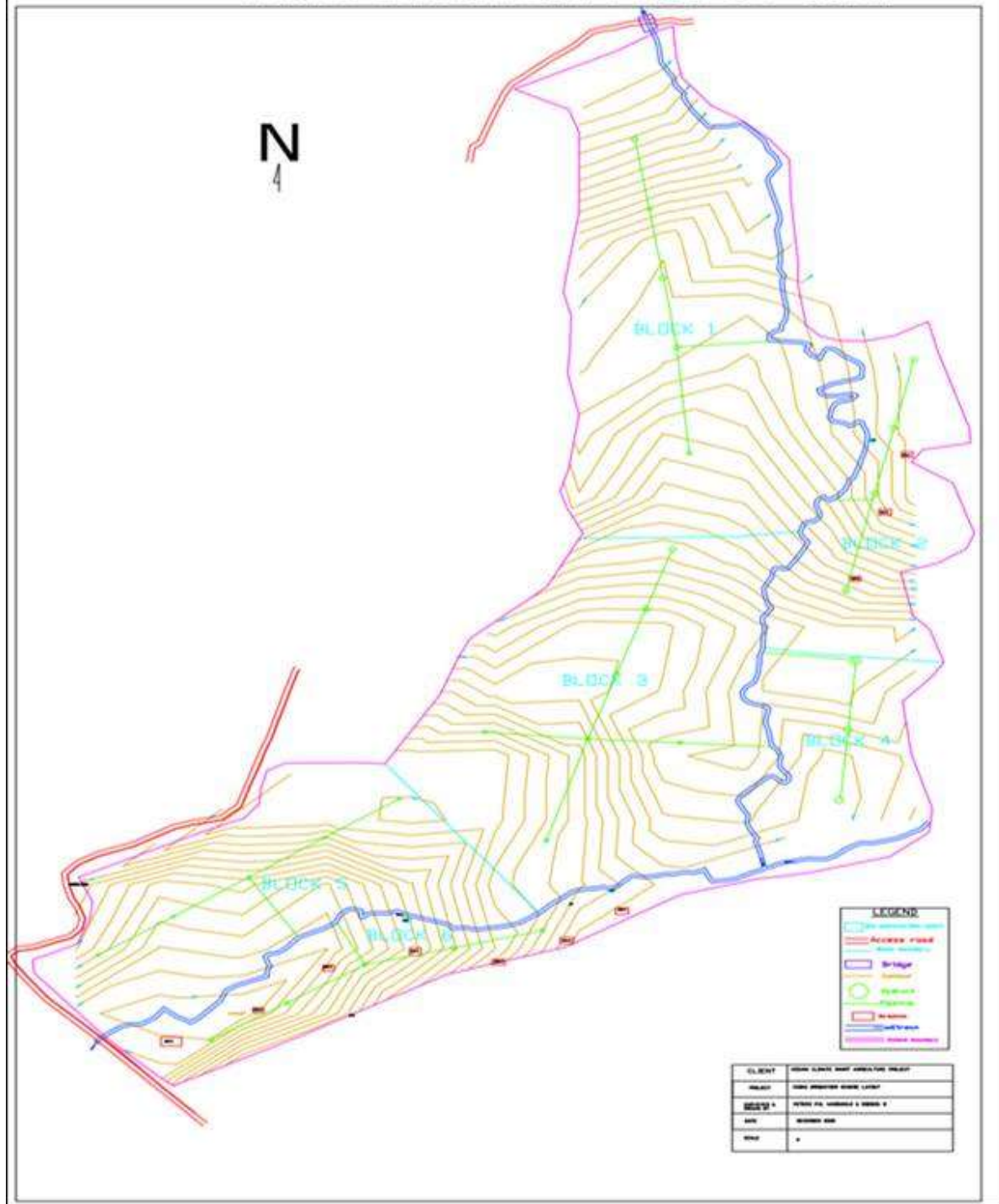


Figure 9-12: Sketch Map Showing the 6 Farming Block at Kabayi Irrigation Scheme

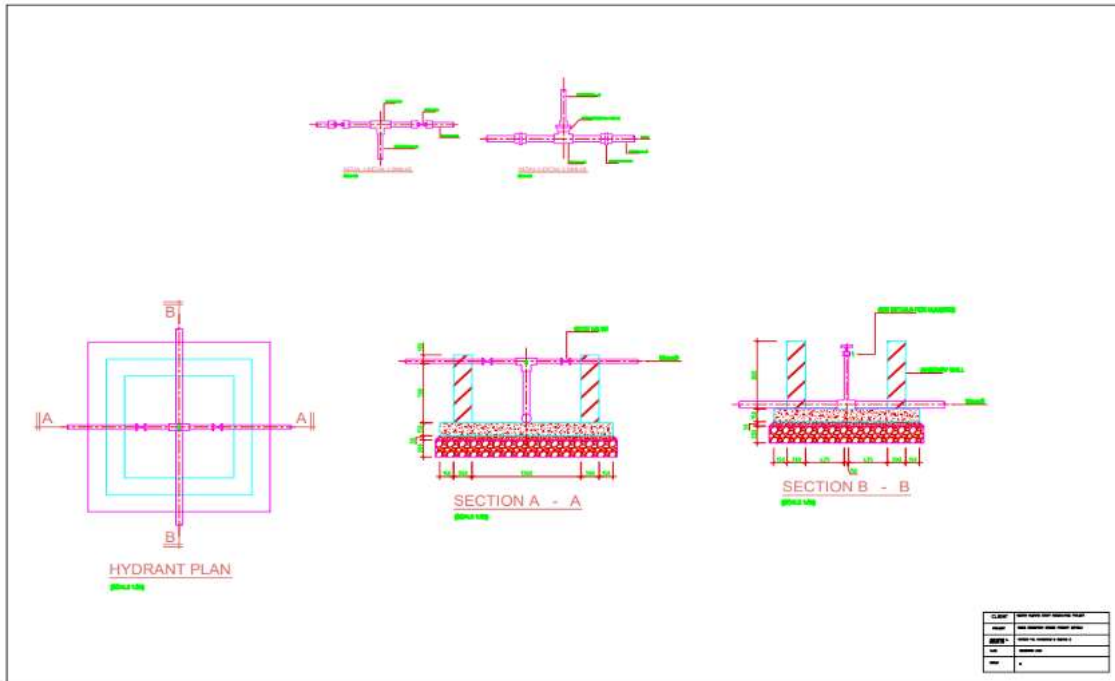


Figure 2.3 Drawing of the designed structures showing components of the irrigation scheme.

