



## **ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT**

### **SUMMARY PROJECT REPORT (SPR)**

#### **THE PROPOSED KIPCHUKUKU IRRIGATION PROJECT, CHEBILAT INTAKE IN ELGEYO MARAKWET COUNTY**

**GPS LOCATION: LATITUDE: 0.1629° N, LONGITUDE: 35.3657° E.**



#### **PROJECT SPONSOR**

**GOVERNMENT OF KENYA/COUNTY GOVERNMENT OF ELGEYO  
MARAKWET  
WITH SUPPORT FROM THE WORLD BANK**

#### **PROPONENT**

**KIPCHUKUKU IRRIGATION SCHEME COMMITTEE**



## CERTIFIATION

### **CONSULTANT**

Befcon Consultants, **P.O Box 1830-3100, ELDORET** hereby submit this Environmental and Social Impact Assessment (Summary Project Report) on the proposed Chebilat intake for Kipchukuku Irrigation Scheme. We certify to the best of our knowledge that the information contained in this report is accurate and a truthful representation as presented by the client.

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**Date:21/06/2021**

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### **CLIENT:**

I,....., the representative of Kipchukuku Irrigation Scheme Committee certify to the best of my knowledge that the information contained in this report is accurate and a true representation.

Designation: \_\_\_\_\_

Signed: \_\_\_\_\_ Date \_\_\_\_\_

On Behalf of: Kipchukuku Irrigation Scheme Committee

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## **ACKNOWLEDGEMENT**

The team of experts would like to thank The County Project Coordinating Unit (CPCU) for the Kenya Climate Smart Agriculture Project (KCSAP) for according us the opportunity to participate in this exercise and for availing the required documents as well as organizing and participating in public participation. In this regard, we want to specifically appreciate Mrs. Margaret Kendagor (Coordinator KCSAP, Elgeyo Marakwet County) and Mr. Ben Kibor (County Environment and Social Safeguard Officer).

We also want to extend our sincere appreciation to the National Project Coordinating Unit (NPCU) led by Dr. Muthee for enhancing the capacity of the expert through a workshop which was an eye opener as regards to the World Bank requirements on matters environment and social safeguards.

Many thanks to the World Bank team for being patient to us and facilitating the engagements including workshops and consultations on capacity building as well as reviewing the report. To my fellow colleagues, thank you for the hard work and persistence.

To the administration team at the site, the farmers and the other professionals we interacted with, we say thank you and God bless you.

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## LIST OF ABBREVIATIONS AND ACRONYMS

CBD	Convention Biological Diversity
C-EMMP	Contractors Environmental and Social Management and monitoring Plan
CESSCO	County Environmental and Socials Safeguards Officer
CIDP	County Integrated Development Plan
CPCU	County Project Coordinating Unit
EA	Environmental Audit
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
ESIA	Environmental and Social; Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plan
FAO	Food and Agricultural Organization
FGD	Focused Group Discussion
GOK	Government of Kenya
KCSAP	Kenya Climate Smart Agriculture Project
KWS	Kenya Wildlife Services
m.a.s.l.	Meters above Sea Level
NEAP	National Environmental Action Plan
NEMA	National Environment Management Authority
NGOs	Non-Governmental Organizations
NPCU	National Project Coordinating Unit
PAPs	Persons Affected by Project
PCPB	Pesticides Control Products Board
PMC	Project Management Committee
SEA	Sexual Exploitation and Abuse
SPR	Summary Project Report
SLM	Sustainable Land Management
TOR	Terms of Reference
WRA	Water Resource Authority
WRUA	Water Resource Users Association

## EXECUTIVE SUMMARY

The proposed Irrigation Project is located in Kabulwo area, Keu Location, Emsoo ward, Keiyo North Sub County in the valley region of Elgeyo Marakwet County at GPS location Latitude:0.1629<sup>0</sup>N, Longitude:35.3657<sup>0</sup>E. The project was proposed by the beneficiary community of 200 households to enable expansion of the Kipchukuku irrigation scheme from the current 142 acres (57.5ha) to 200acres (80ha) by abstracting water from the neighboring Chebilat River. The proposed project is intended to increase water for irrigation and subsequently the area under irrigation which is key to improved agricultural production for food and nutritional security, income generation and as an intervention to empower communities to build resilience against the challenges of climate change.

The Project is implemented through the Kenya Climate Smart Agriculture Project (KCSAP), a Kenya Government initiative funded by the World Bank whose development objectives is increasing productivity and incomes, enhancing resilience to climate change and reduction of Green House Gases (GHGs). The specific proposed interventions for this project include construction of Chebilat water intake, construction of a water tank and piping of water to the main Kipchukukuu piping system to increase water volume to irrigate 200 acres of farms in the irrigation scheme.

The Environmental and Social Impact Summary Project Report has been conducted in compliance with the Environmental regulations, the EMCA, 1999(Rev 2015) and its subsequent supplements regulating major development including the World Bank Environmental and Social Safeguard Policies.

This SPR process involved desk review of literature relating to the project, baseline study of the project area, review of the relevant legal, institutional, regulatory and policy framework, public consultation and stakeholders' engagement through public meetings, focused group discussion and key informants' interviews as well as data collection using questionnaires.

The total number of participants during the public participation meetings conducted on 8<sup>th</sup> April and 26<sup>th</sup> October, 2020 were 115 people (64 males, 51 females). Similarly, three focused group discussion were conducted targeting the women (60), the youth (50) and the differently abled persons (5). A total of 8 key informants were also interviewed. During the public participation meeting data was also collected using structured questionnaires. A total of 111 questionnaires were distributed out of which 49 questionnaires were filled and returned.

Additionally, 5 stakeholders were consulted to obtain more information on the proposed project.

The main issues raised during the public participation and stakeholder's consultation include project sustainability, catchment conservation, and provision of water troughs for livestock and equal distribution of water to the irrigation farms. To address these issues the following measures were proposed: water users paying water user fee to the Project Management Committee (PMC), planting of agroforestry trees in the water catchment on yearly basis, training of PMC on leadership and governance and construction of two water troughs for livestock in the scheme.

The potential positive impacts identified included increased employment opportunities, improved infrastructure, improved nutrition, increased household incomes, improved environment due to planting of trees, reduced water borne diseases and increased quality of life. The anticipated negative impacts included loss of biodiversity, soil erosion, soil compaction, pollution of rivers, gender based violence, sexual exploitation and abuse and occupational and safety hazards. Appropriate mitigation measures have been provided in the Environmental and Social Management Plan (ESMP). The main mitigation measure includes planting of trees, control of soil erosion, training on safe use of agrochemicals, capacity building of the beneficiaries on gender, HIV, COVID-19 and climate smart technologies, use of recommended machinery was suggested to reduce soil compaction among others.

The County Project Coordination Unit, KCSAP Elgeyo Marakwet County through the County Environmental and Social Safeguard Officer (CESSCO) will follow up and monitor the implementation of the ESMMP. The Contractor, PMC, supervising engineer and the community will be required to ensure the implementation of the proposed mitigation measures. The estimated cost of implementation of the ESMMP which should be included in the project cost is Kenya shillings 1,550,000. The client is expected to share the ESMMP with the contractor who then is expected to prepare and implement a contractor's specific ESM & MP.

Considering the positive and negative impacts, this project will not result to significant or irreversible impacts since all anticipated negative impacts will easily be mitigated through the ESM & MP. Therefore, the project is recommended for approval and issuance of license by the National Environmental Management Authority (NEMA).



## **CHAPTER ONE.**

### **INTRODUCTION**

#### **1.1 Background Information.**

The County government of Elgeyo Marakwet recognizes the importance of irrigated agriculture in improving agricultural production for food security, poverty alleviation and economic growth. Irrigated agriculture is one of the priority projects in the Elgeyo Marakwet CIDP 2018-2022 under the department of Agriculture and Irrigation. Kipchukuku irrigation scheme which is located in Kabulwo area, Keu location, Emsoo ward, Keiyo North Sub County in the valley region of Elgeyo Marakwet County about 30 km. along Biretwo-Arror road off Iten-Kabarnet road is one of such initiatives. The irrigation scheme (Kipchukuku) which currently supply water for irrigation of 142 acres was established in 2016 by government through National Irrigation Board. The irrigation scheme supports production of maize, tomatoes, green grams, beans, sorghum, cassava, finger millet, paw paws, mangoes and vegetables all the year round. The proposed expansion of Kipchukuku irrigation scheme will increase water supply for production of tomatoes, green grams, sorghum, bananas, maize, beans, finger, and millet and paw paws through irrigation from the current 142 acres to 200 acres. This would result into increased productivity and income hence food security, improved livelihood and environmental protection which is in line with the core objectives of KCSAP.

#### **1.2 Project Justification**

Establishment of irrigation and drainage infrastructure is considered a priority by the Kenyan government in enhancing agricultural productivity and contributing to food security as well as poverty alleviation. The proposed project is relevant to the KCSAP triple wins which include increasing productivity and income, resilience to climate change and reduction of Green House Gases. The proposed expansion of Kipchukuku irrigation scheme is aimed at increasing the supply of water for agricultural production through irrigation. The targeted crops include tomatoes, green grams, maize, beans, finger millet, mangoes, bananas, paw paws and vegetables.

The major considerations for supporting the implementation of this project include

- The proposed irrigation infrastructure will enhance the efficiency of irrigated water conveyance
- The project will result to jobs creation and income generation opportunities
- Sufficient water from abstracted Chebilat River and Kipchukuku River to support the irrigation of 200 acres

The project will enable increased productive and productivity hence increased food supply and income.

### **1.3 Environmental Social Impact Assessment Summary Project Report**

The CPCU, KCSAP Elgeyo Marakwet contracted Befcon Consultants to undertake an Environmental and Social Impact Assessment and prepare a Summary project report based on the recommendation of the County Director of Environment, Elgeyo Marakwet. This followed screening using the Environmental and Social Safeguards Checklist. The SPR was conducted in compliance with the Environmental regulations, the EMCA,1999(Rev 2015) and its subsequent supplements; the Environmental (Impact Assessment and Audit) Regulation, 2003 (Rev. 2009); EMCA (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006; the Land Acts, the Water Act 2002 and the Irrigation Act among other pertinent legal and institutional frameworks regulating major development including the World Bank Environmental and Social Safeguard Policies. O.P 4.01 Environmental assessment (EA) of projects proposed, OP 4.09 Pest Management, OP 4.10 Indigenous Peoples, OP 4.11 Physical Cultural Resources and OP 4.12 Involuntary Resettlement. All environmental and social issues related to the proposed project have been considered. The main objective of this report is to ensure that all the potential Environmental and Social Impacts have been identified and appropriate mitigation measures proposed for adoption during project's cycle.

### **1.4 Objectives of the SPR**

The objective of this study was to undertake an ESIA(SPR) for the proposed Kipchukuku Irrigation Project to establish potential impacts of the project's activities on the environment including social concerns and to identify mitigation measures.

The specific objectives include: -

1. To comply with EMCA 1999 and World Bank Safeguard Policies
2. To describe the nature of the proposed Project site including the layout, design and planned activities
3. To conduct a comprehensive public participation and document the outcome
4. To identify the impacts of the proposed project's activities on the environment and social aspects
5. To propose mitigation measures for the significant negative environmental and social impacts

6. To develop an Environmental and Social Management and Monitoring Plan(ESMMP)
7. To make recommendations based on the findings of the ESIA(SCR)

### **1.5 Approach and Methodology of Summery Project Report**

This study adopted an integrated approach which included Environmental and Social Safeguards (ESS) screening, desk review, field investigations, consultations among experts, interviews and discussions with stakeholders and affected parties.

- a) **Environmental and Social Screening:** This was conducted by the Environmental and Social safeguards officer to determine the ESS instrument hence the Summery Project Report (SCR)
- b) **Environmental and Social Scoping:** This was conducted to determine the environmental and social aspects that were likely to be affected by the proposed project. This was important for the identification of the likely impacts.
- c) **Desk review** entailed review of literature of the existing documents regulations and guidelines such as Environmental Management and Co-ordination Act (EMCA) as well as other related statutes and international codes on water use.
- d) **Field visit:** This was undertaken for physical evaluation of areas of interest including intake, farms and general infrastructure. Information gathering was conducted through two site visits to the project, one transect walk and interview with the key informants of the project which included the area chief, assistant chief, project management committee and opinion leaders. A transect walk was carried out during the field visit to quantify the perceived impacts of project on land use, land conflicts and ownership, areas of insecurity, existing institutions in the area, vegetation cover and ecologically sensitive areas such as underground and surface waters; animal grazing areas and migratory routes. The information gathered also included the existing strategies towards environmental protection.
- e) **Public participation** meetings and consultative meetings at the administrative and community levels were held to collect information on the beneficiaries` perceptions on benefits and impacts of project implementation. Two (2) public participation meetings were conducted in full adherence to the government directive on the COVID-19 pandemic- social distancing, wearing of face masks, use of sanitizers and limiting the number of contact hours. The total number of participants during the public consultation were 115 people comprising of 64 males and 51 females (Appendix 2 showing list of participants). Three (3) focused group discussions were also conducted during the public

participation targeting the youth, the women and differently abled persons. Relevant stakeholders were also consulted including the Department of Agriculture and Irrigation (Annex 5). Detailed outcome of the public participation and stakeholder consultation is presented in chapter five of this ESIA project report.

- f) **Preparation of Draft ESIA(SPR):** This involved putting together information from the assessment

### **1.6 Organization of the SPR**

The report is organized into seven substantive chapters. Chapter one presents the introductory chapter, Chapter 2 gives nature of the project, Chapter 3 presents the project location while Chapter 4 presents the outcome of the public participation and stakeholder consultation process, Chapter 5 discusses the anticipated impacts and proposed mitigation measures of the project, Chapter 6 presents the Environmental and Social Management and Monitoring Plan (ESMMP). Chapter 7 presents the conclusions and recommendation followed by references and annexes.

## **CHAPTER TWO**

### **NATURE OF THE PROJECT**

#### **2.1 Introduction**

This section presents the design, proposed activities, materials and equipment and estimated project cost

#### **2.2 Project Design**

The main components of the project are intake and weir works, sedimentation tank and chambers, main conveyance line, piping works and a construction of 100M<sup>3</sup> water tank that will store water for irrigation. The new irrigations system is expected increase the irrigation area from the current 142 acres to 200acres.

#### **2.3 Project Activities for the proposed Project**

##### **2.3.1: Preliminary activities**

This includes activities conducted before the actual works for the proposed project commences

##### **2.3.1.1 Initial Site Meeting**

This will entail initial site meeting to introduce the contractor to the site and to the management committee by the KCSAP CPCU and the supervising engineer.

##### **2.3.1.2 Mobilization of plants and machinery**

This will involve assembling all the machines and equipment required for the planned activities for the proposed project

##### **2.3.1.3 Erection of Signboard**

This will involve putting up a signboard for the proposed project with all the necessary information as prescribed in the contract

#### **2.3.2 Construction of Weir and intake works**

This will involve construction of an intake and weir across Chebilat River to increase the volume of water being abstracted from Chebilat river thus increasing the acreage under irrigation. The weir will be 8m long, 0.6m high, with top and bottom widths of 0.85 m and 1.75 m respectively. The weir will be constructed from reinforced concrete grade 20/20. The intake

is about 3 km from the farms and the proposed intake pipe is 288 mm. in diameter. River bank protection works should thus be incorporated at the intake.

### **2.3.3 Construction of Sedimentation chamber and Sluice valve chamber**

The sedimentation chamber will be constructed with dimensions of 6.0m length, 1.5m width and 1.8m height as per the design calculations to remove silt and discharge back to the river. It will have 2 scour pipes of 25mm diameter that will continuously remove the silt. The sluice valve chamber will be 1.5m long, 1.2 m wide a 1.0m high which will also house the master meter.

### **2.3.4 Conveyance system**

The main conveyance system comprises of a pipeline of 280 mm diameter. The pipeline runs through soil and rocky sections which require GI pipes. There are two sub mains and eight distribution pipelines. The system is expected to convey a total flow of 84.4 l/s to 200 farmers to irrigate 51.2 ha.

### **2.3.5 Construction of Storage tank**

This will be a 225m<sup>3</sup> ground masonry tank that will be used to store water before it is released to the main pipeline going to the farms. It will be constructed on the new pipeline that augments water to the existing pipeline

## **2.4 Materials and Equipment**

### **2.4.1 Materials**

The materials required for the proposed project include pipes (GI and PVC pipes) and fittings (GI bends, valves, connectors), hardcore, High tensile steel (D10 and D12) for weir body at spacing specified by the engineer, BRC A152 for weir apron, cement, sand, timber for slab support.

### **2.4.2 Equipment**

The equipment required for the proposed project include excavation equipment, concrete mixer and assorted masonry tools

## **2.5 Project Cost**

The estimated costs of Kipchukuku Irrigation project including the cost of ESMMP implementation is Kenya shillings 15, 182,000.

## CHAPTER THREE

### THE LOCATION OF THE PROJECT

#### 3.1 Introduction.

This section provides the project location, land ownership, conformity to land use plan and supportive environmental and social management infrastructure.

#### 3.2 Project Location

Kipchukuku irrigation project is situated in Kabulwo Sub location, of Keu location, Emsoo ward, Keiyo North Sub-county, Elgeyo-Marakwet County at GPS coordinates: Latitude: **0.16290 N**, Longitude: **35.36570 E**. It is situated along Biretwo- Arror-Tot road; about 30 km from the main road (Iten – Kabarnet road). Kipchukuku Irrigation project is being undertaken by Elgeyo Marakwet County through the Kenya Climate Smart Agriculture Project to boost food security and wealth creation. It is meant to benefit about 200 households who are small scale farmers under sprinkler irrigation. About 200 acres of land will be put under irrigation and each farmer will be allowed to irrigate 1 acre of cropland.



Figure 3.2: Proposed Project Location

#### 3.3 Land Ownership

The land ownership in the area is communal. However, the beneficiaries of this project and other community members have followed the processes of land demarcation and are soon to acquire individual land title deeds (Refer Annex 7). The land where the main irrigation infrastructure (weir and intake) is constructed is a public land (escarpment) and forest service

has no objection to the community abstracting water from the intake (Refer Annex 8). Similarly, adequate consultation has been done with the members of the community on the no objection for underground passage of irrigation pipelines on their farms and they have consented on way leave on their farms (Refer Annex 9).

### **3.4 Supportive Infrastructure for Environmental and Social Management**

#### **3.4.1 Transportation**

The area is accessed via Biretwo-Arror murram road off Iten-Kabarnet road and only a few vehicles offer transport in the area. However, there are many motor cycle riders that offer transport services in the community. This is important to allow transportation of solid and liquid waste from the project site to designated sites away from the project site.

#### **3.4.2 Telecommunication**

The project area is served by two network provides Safaricom and Airtel. This is necessary to enable communication to seek support in case an emergence i.e. workers' injury during the project implementation.

#### **3.4.3 Health facilities**

The area is served by Kabulwo dispensary located 500 meters from the project site. Therefore, minor water related illness and injuries arising from the irrigation project can be handled at the facility.

#### **3.4.4 Waste management system**

Most household have pit latrine to manage human waste. Other waste at household level are either dumped in compost pits or burned in shallow pits. Livestock wastes are used as organic manure to improve the fertility of the soils. Proper waste management system should therefore be included in the design of the project

### **3.5 Conformity to land use plan**

The land tenure in the area was initially communal. However, the beneficiaries of this project and other community members have followed the processes of land demarcation and are soon to acquire individual land title deeds. This will alter the land tenure system from communal (community) to private owned and it will lead to increased utilization of land as a resource. The implementation of the proposed project is in line with the land use plan since the project site land is designated for agricultural irrigation scheme.



## **CHAPTER FOUR**

### **PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATIONS**

#### **4.1 Introduction**

Public Participation and stakeholders consultation was conducted as stipulated in the Kenya constitution 2010, County Government Act and Environmental Impact Assessment and Audit Regulations of 2003 (amendment 2019). However, due to the government restrictions and World Bank guidelines following Covid-19 pandemic, the number of those consulted was minimized to a representative number as guided and led by the area chief and those living close to the proposed project site. During all public participation meetings, COVID-19 guidelines on social distancing, wearing of face masks, use of hand sanitizers as well as limiting the number of people during the meetings were followed.

#### **4.2 The Objective of Public Participation and Stakeholders Consultations**

The objectives of the public participation and stakeholder consultation were to get the scope of the SPR, to probe for possible environmental and social impacts of the proposed project and how to mitigate against any negative impacts as well as the baseline information of the project area.

#### **4.3 Stakeholders identification**

During the ESIA exercise relevant stakeholders were identified and inventoried (*Annex 5*). Each stakeholder was consulted on specific aspects of the projects ranging from the design, views on benefits, likely negative impacts and involvement at all stages of implementation. The views, issues and suggestions were documented.

#### **4.3 Methodology of Public Participation and Stakeholder Consultations**

The methods used in public participation included public meetings, focused group discussion and key informant interviews. Two (2) public participation meetings and three (3) focused group discussion were conducted on the 8<sup>th</sup> April 2020 and 26<sup>th</sup> October 2020. During the public participation meetings data was collected using structured questionnaires from key informants. Focused group discussions focused on the women, youth and differently abled persons. A total of 115 people (64 males, 51 females) participated in the public participation meetings and stakeholder consultation. The team ensured strict adherence to the COVID-19 protocols (social distancing, hand washing and wearing of face masks) as stipulated by the

Ministry of health in all the public meetings to prevent the spread of the disease.

#### **4.4 Summary of issues raised by the community and stakeholders and responses**

During public consultations, members of the community mainly concentrated on the direct benefits of irrigating farms including; Availability of water for irrigation and scarcity of water during dry season. Other positive impacts raised included reduction in poverty levels of many households as a result of increased incomes from sale of produce, creation of employment opportunities in form of farm labor and related input and output activities, diversification of farming enterprise leading to improved nutrition, reduction of labor and cost of irrigated farming which currently uses pumps to abstract water from the river to the farm. The community did not dwell much on negative impacts but the consultant's team assessed the site and came up with possible negative impacts arising from the project (see Chapter six)



Photo 5: Public participation with project members

During the consultative meetings, the following areas of interest were discussed;

- a) **Economic activities in the area.** The public indicated that these activities will be improved during implementation, for example employment opportunities for the youth, women and orphans. This will be addressed by advising the contractor to employ and source materials from the local area during construction phase of the project. The increased agricultural will lead to increased volumes of farm produce and consequently increase marketing activities and local incomes.
- b) **Land use and management in the area.** The public were notified that the area will

be under irrigation for crops and pasture for livestock. The public suggested that fodder should be established along the terraces and the acacia trees be conserved in the scheme. This concern will be addressed during land clearing, soil and water conservation trainings that will be conducted by the agriculture staff as in the ESMMP. The community suggested that the fodder grown in the scheme be harvested and fed to livestock. However, it was also noted that the number of animals need to be reduced and quality be improved to fit the carrying capacity of the area.

- c) **Socio-economic and environmental challenges in the area.** The socio-economic and environmental challenges during project implementation were raised by the public. The public advocated for fair employment and business opportunities during project implementation phases. This issue has been addressed in the ESMMP on conservation of soil and environment.
- d) **Flora and fauna may be destroyed during construction.** The public expressed the need of minimizing clearing of trees. This issue will be addressed by the ESMMP on conservation of biodiversity.
- e) **Community conflicts.** This concern was raised due to water use in the farm. This concern will be addressed through project management committee and public meetings. It was also suggested that two water troughs be constructed to serves as drinking points for livestock in the scheme

## CHAPTER FIVE

### ANTICIPATED IMPACTS AND MITIGATION MEASURES

#### 5.1 Introduction

This chapter presents the assessment of the issues likely to arise as a result of implementation of the proposed Kipchukuku irrigation project. The anticipated impacts are discussed in three phases namely: construction, operational and decommissioning phases

#### 5.2 Anticipated Impacts during Construction Phase

##### 5.2.1 Positive Impacts during Construction

- a) **Employment Opportunities:** There is anticipated increase in job opportunities through; recruitment of skilled and unskilled labor from the locals, service provision to the construction workers in terms of meeting their food, accommodation and transport requirements.
  
- b) **Improved Infrastructure:** The access roads that be rehabilitated during phase to facilitate activities.
  
- c) **Increased Income:** The construction works will provide a market for the locally available materials while the services required by the construction workers will boost the local businesses. Project implementation in the proposed area will increase employment opportunities hence improved incomes.
  
- d) Infusion of skills and knowledge to the locals through interactions with the outsiders

##### 5.2.2 Anticipated Negative Impacts and Mitigation measures during Construction phase

The negative impacts during the construction phase will be short lived but may pose a great danger to the environment. Lack of effective maintenance of the construction site environment is likely to impact on the project area and its environment adversely. Some of the negative impacts include;

###### a) **Loss of Fauna**

It is anticipated to the laying of water pipes and transportation of construction materials would lead to loss of biodiversity of flora. This impacts is however minimal and appropriate mitigation measure shall be put in place for its mitigation.

### **Proposed Mitigation Measures**

- The contractor should sensitize construction workers on environmental conservation
- The contractor should avoid cutting indigenous trees and vegetation within the survey area path of the water conveyance
- The contractor should ensure re-vegetation of completed pipeline routes and around the water intakes with indigenous trees
- The contractor should ensure that transportation of construction is done through existing local routes

### **b) Destruction of wildlife habitat**

The construction of the weir and intake is likely to destroy the wildlife habitat. The impact is however minimal if proposed mitigation measure are implemented.

### **Proposed Mitigation Measures**

- The contractor should retain and protect habitats diversity by conserving them during construction
- The contractor should not excavate the riparian sections since they serve as habitats for several animal species
- The contractor in collaboration with Kenya wildlife services should sensitize the public on the importance of wild life conservation

### **c) Soil Erosion**

An increase in soil erosion may result from loosening of the soil during construction works and vegetation clearing. In addition, some of the loose soils lead to siltation and thus affecting the aquatic life.

### **Proposed Mitigation Measures**

- The contractor should ensure that all excavation works are properly compacted
- The contractor should incorporate erosion control measures during construction
- The contractor should not use topsoil during the construction phase
- The contractor should ensure intensive re-vegetation on bare grounds after construction

#### **d) Soil Compaction**

The high traffic especially of machineries and the construction workforce within the project area is likely to lead to compaction of the soil structure leading to reduced water infiltration.

#### **Proposed Mitigation Measures**

- The contractor should ensure that all machines are operated on the existing roads or tracks as much as possible
- The contractor should ensure that there are no unnecessary vehicle movement
- The contractor should avoid compaction during stockpiling by working the soil in its dry state
- The contractor should ensure revegetation on bare ground to reduce run-off

#### **e) Pollution of rivers and wetlands**

The construction of the intake water conveyance system, if not well controlled could deposit construction wastes such as sediments from the earthworks, oils and fuels into the rivers. This may lead to potential pollution of the water especially for downstream users and may also affect the aquatic life.

#### **Proposed Mitigation measures**

- The contractor should regularly check on the equipment in use to ensure they are well maintained and in good working condition to prevent leaking oils and fuels.
- The contractor should ensure that refueling is done in safe locations where there is no likelihood of spillages
- The contractor should ensure that generated solid waste are disposed in designated site
- The contractor should ensure that all construction equipment and machineries are clean and mud free

#### **f) Dust and Noise pollution**

During construction phase it is expected that there will be an increase in traffic flow into the project area to including heavy and other vehicles ferrying construction materials. The access roads that are largely earthen roads could result in increased dust and noise. This is likely to affect the health of the residents and the aesthetic value of the areas.

### **Proposed Mitigation Measures**

- The contractor should ensure that vehicles delivering materials to the site use designated routes and speed limits
- The contractor should ensure there is regular watering of dusty roads and maintenance during this stage.
- The contractor should provide construction workers with dust masks and ear protectors
- The noise levels should be kept at the minimum acceptable levels and the construction activities be confined to the normal 8 am to 5pm working hours

### **g) Extraction of Construction Materials**

There will be demand for construction materials in bulk such as sand, gravel and rocks. These will be extracted from the local sources. The extraction and transportation of these materials is likely to result in the disturbance of the soil structure, vegetation loss, dust emission, oil spills, noise and potential for accidents. Quarries and barrow pits associated with extraction of materials hold water that can be a suitable breeding grounds for mosquitoes and other disease vectors, leading to increase of water borne diseases. These temporary pits can lead to possible drowning accidents.

### **Proposed Mitigation Measures**

- The contractor should source construction from approved site by the local authorities
- The contractor to ensure adequate re-use of the excavated waste materials
- The contractor should ensure adequate landscaping, backfilling and draining of the depressed areas to prevent breeding grounds for disease vectors
- The contractor should give advance notice to the nearby communities on the intended excavation.

### **h) Generation of Solid wastes**

The construction activities will lead to the production of solid wastes such as soils, rock debris, metal cut offs and plastics, cardboards, paper, wood and waste concrete among others. The effects of improperly managed wastes could be far reaching and may include aspects of environmental pollution.

### **Proposed Mitigation measures**

- The contractor should sensitize construction workers on proper disposal of waste

- The contractor should promote reuse, recycling and reduction of wastes
- The contractor should provide adequate litter collection facilities designated in the construction site
- The contractor should ensure that collected waste are disposed in designated licensed sites approved by NEMA in accordance with the waste management regulations
- The contractor should construct a temporary pit latrine for use by workers.

**i) Generation of Liquid Wastes**

Liquid wastes including oil spills, grey and black water, concrete washing, run off from workshop areas and various liquid wastes from the washing of construction vehicles and equipment will be generated during construction works. These wastes are likely to cause imminent threats to the groundwater quality and other aquatic bodies.

**Proposed Mitigation Measures**

- The contractor should ensure that grey water runoff from the working areas is contained and properly channeled or reused.
- The contractor should ensure that water containing pollutants such as cement, concrete, lime, chemicals and fuels are discharged into a conservancy tank for removal from the site
- The contractor should ensure that potential pollutants are stored, kept and used in such a manner that any escape can be contained to avoid degrading the environment.
- The contractor should ensure that maintenance of vehicles and other machineries are done in designated locations.
- The contractor should ensure regular maintenance of machineries to ensure they are in good working conditions and are free from leaks
- The contractor should ensure that soil contaminated by oil spills or pollutants are immediately scooped and disposed in designated sites

**j) Occupational hazards and Health risks.**

The construction activities will likely employ several persons and therefore expose them to various safety and health risks such as accidents, injuries or illnesses. These include exposure to food related diseases as most of the workers will be feed at the work site.



### **Proposed Mitigation Measures**

- The contractor should comply to all health and safety standards when handling workers on site
- The contractor should provide all workers with appropriate personal protective equipment (PPEs)
- The contractor should establish an assembly area for all workers in case of an accident and maintain a record of all works at the site at each particular time.
- The contractor should sensitize all workers on construction safety measures
- The contractor should provide equipped first aid kits at the site and first aid training given to the supervisors for handling potential casualties
- The contractor should have workmen's compensation cover to avoid liability in cases of serious accidents.
- The contractor should provide clean sanitary facilities and clean drinking at the site.
- The contractor should ensure that warning signs are erected to warn on construction activities and heavy machinery at site
- The contractor should ensure that risky areas such as deep pits are covered or fenced off to avoid accidents
- the contractor should provide insurance cover to the workers under the employment compensation Act

### **k) Gender Based Violence (GBV) at construction site**

The interaction between the community members and the construction workers may result in GBV.

### **Proposed Mitigation Measures**

- The contractor should ensure that that all construction workers are sensitized on GBV
- The contractor should comply with the provisions of the GBV policy to safeguard the community against the vice.

### **l) Increased spread of STDS/HIV/ AIDs**

Sexual relationships between community members and the construction workers may result to GBV in the area.

### **Proposed Mitigation Measures**

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

#### **m) Increased risk of spread of covid-19 pandemic.**

Covid-19 pandemic spread among people during construction may occur in the project area. The human interactions may increase the risk of spread of the pandemic.

#### **Proposed Mitigation measures.**

- The contractor should adhere to the standard operating procedure (SoPs) on the prevention of the spread of COVID-19
- The contractor should sensitize the public on covid-19 government of Kenya regulations to reduce risk of the spread.
- The contractor should provide hand washing equipment at strategic points within the site.
- The contractor should provide hand sanitizers in construction site for people to sanitizes their hands
- The contractor and supervising engineer to ensure that participants in the site meetings wear face masks and keep social distance.

### **5.3 Anticipated Impacts during Operation Phase**

#### **5.3.1 Positive Impacts at the Operation Phase**

**a) Food Security:** The proposed project through the irrigated agriculture will result in increased agricultural production. This will increase food security both at the individual household and national level. Diversification in crop production will also be achieved contributing to nutritional security. There will also be increased livestock productivity due to availability of fodder.

**b) Increased Agricultural Activities and Economic Growth:** The proposed development project will avail adequate irrigation water to areas previously not well fed with water for

irrigation thus increasing crop and livestock productivity. This alongside the related input and output markets will boost the economy of the area and beyond.

- c) **Income Generation Opportunities:** The project will directly create employment for those members of the community who will be hired as construction workers and also income generation opportunities for those who will be offering services such as food provision and transport services. Other activities in various value chain levels will increase incomes among its players.
  
- d) **Improved Infrastructure:** The expansion of the irrigation project will trigger infrastructural developments within the area such as the expansion of the roads, markets and others recreational facilities. The improved productivity will also attract more business people to the urban centers leading to improved housing both for accommodation and recreational facilities.
  
- e) **Opportunities for Skills Acquisition:** The implementation of the project activities will trigger increased demand for skill improvement such as agricultural extension services and marketing skills.

### **6.3.2 Anticipated negative impacts and mitigation measures during operation phase**

#### **a) Water Quality Degradation**

The quality of the water resources may be affected by intensified use of pesticides and fertilizers leading to ground water pollution and eutrophication in the water bodies. The disposal of empty agrochemical containers may lead to pollution and poisoning of aquatic life.

#### **Proposed Mitigation Measures**

- The local agricultural officers' services should train farmers on fertilizer use and the safe use of agro chemicals as well as use of integrated pest management
- The proponent should prepare and implement pest management plan and seek for clearance before commencement of farming activities
- The proponent should ensure proper disposal of wastes

### **b) Soil salinization, sedimentation and nutrient leaching**

The uncontrolled use of fertilizers and pesticides may lead to increased soil salinity. The excessive use of irrigation water is likely to change both the soil's physical and chemical attributes as well as to water logging and leaching of water soluble nutrients to levels where they are no longer available for use by plants.

#### **Proposed Mitigation Measures**

- The amount of water abstracted from the river should be controlled through appropriate design of the intake to include facilities for regulating irrigation pipe's discharge
- The Project Management Committee (PMC) should ensure installation of appropriate drainage channels to drain any excess water from the farms.
- The proponent should frequently monitor soil salinity through analysis of soil carried out before project implementation and with every annual audit
- Afforestation and vegetation growth should be encouraged especially along the river banks
- The PMC should ensure maintenance and operation of the irrigation infrastructure should be maintained regularly to ensure that localized irrigation does not occur
- The PMC should ensure cultivation limits to the river systems are identified and strictly adhered to.
- The PMC should ensure that there is appropriate terracing where possible
- The PMC should ensure that water application does not exceed soil intake rate, over-irrigation
- Construction of water pans along the conveyance route to act as silt traps

### **c) Soil erosion**

#### **Proposed Mitigation Measures**

- There should be erosion control measures on areas prone to erosion especially steep slopes by installing soil erosion control structures
- There should be intensive re-vegetation on bare grounds after construction
- Provide fruit trees to farmers along slopes

### **d) Water borne diseases**

The most common diseases in the area (as reported by the Health officer) include malaria and upper respiratory tract infections. Malaria is common because of water pools and the

vegetation. Other diseases such as bilharzia, may come in but currently not experienced in the area. Water borne diseases have reduced due to piped water, as explained by the Public Health Officer during stakeholder consultation.

#### **Proposed Mitigation Measures**

- The members of the community should be sensitized on preventive and control measures.
- These measures include spraying and use of treated nets for malaria control.
- Construction of pit latrines should be encouraged control diseases.
- The county government should establish additional health facilities as well, equipping and manning the existing ones to deal with the new cases
- The Ministry of public health should ensure there is regular spraying within the project area to control mosquitoes
- Regular flushing of stagnated water to destroy breeding grounds.

#### **e) Interference of livestock movement paths**

The excavation of irrigation pipes may interrupt movement patterns of the livestock. Introduction of irrigation in the area may reduce grazing land for livestock and may cause conflicts between crops and livestock. This could lead to conflict between irrigating farmers and those keeping livestock

#### **Proposed Mitigation Measures**

- The proponent should organize public meetings to discuss conflicts related with land use in the project area.
- The irrigation infrastructure should be protected by erecting a fence to reduce destruction of crops by livestock.
- There should be a provision of water troughs for livestock outside the scheme in the design

#### **f) Human- wildlife conflict**

If livestock are left unattended to, they may stray into the farms and damage the crops as they search for forage and water for drinking. Crops may be destroyed by wild animals such as gazelles, monkeys which will lead to human- wildlife conflicts.

#### **Mitigation Measures**

- The proponent in collaboration with the department of livestock should sensitize herders and the general community on possible conflicts that may arise
- Fence off the farms to minimize conflicts between farmers, livestock and wildlife
- Provide livestock watering troughs outside the farm to avoid animals straying into the farms

#### **g) Pests and Crop Diseases**

Increased acreage of irrigated land may create a conducive environment for agricultural pests and diseases triggering increased use of pesticides.

#### **Proposed Mitigation Measures**

- The farmers should be trained on pest and disease control and management, especially integrated pest management
- Conduct pest and disease surveillance to monitor prevalence of both existing and new pests and diseases in the scheme.

#### **n) Gender Based Violence (GBV) at community level**

The interaction between the community members and the construction workers may result in GBV.

#### **Proposed Mitigation Measures**

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

#### **h) Water use Conflicts**

The following water related conflicts are likely to occur as identified during public participation:

**Water for irrigation versus livestock needs:** It was noted that the previous designs for the irrigation scheme (done by NIB) did not consider water for livestock. There was no provision for drinking troughs for livestock.

#### **Proposed Mitigation measure**

- The project should consider installation of water troughs at appropriate places for livestock use.

**Scramble for water during dry season:** It was established that the area experiences a dry spell from December to March. This is the period when water is inadequate for the users and may result in conflicts.

**Proposed Mitigation measures**

- The management of the scheme should ensure fairness in the distribution of irrigation water during the dry season.
- The users should be trained on efficient water use to enable conservation
- The users should also invest in water storage tanks to conserve water.
- The members should also adhere to by-laws related to water use to reduce wastage

**i) Risk of spread of COVID-19 among community members**

Covid-19 pandemic spread among people during operations may occur in the project area from the interactions of community members sharing the irrigation resources.

**Proposed Mitigation measures**

- The proponent should adhere to the standard operating procedure(SoPs) on the prevention of the spread of COVID-19
- The project management committee (PMC) should sensitize the public on covid-19 government of Kenya regulations to reduce risk of the spread.
- The PMC should provide hand washing equipment at strategic points within the site.
- The PMC should provide hand sanitizers in construction site for people to sanitizes their hands
- The PMC engineer to ensure that participants in the site meetings wear face masks and keep social distance.

**5.3.3 Anticipated impacts during Decommissioning**

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

**a) Loss of livelihood and the income earning capacity**

**Proposed Mitigation measures**

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

## **b) The generation of solid waste**

### **Proposed Mitigation measures**

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

## **c) Noise and dust pollution**

### **Proposed Mitigation measures.**

- Put off idle machinery to reduce noise pollution.
- Use of machinery that are designed to produce low decibels.
- Use of ear muffs by workers to reduce impact of excess noise.
- Control the speed of running machines
- Sprinkle water to the ground surface to reduce dust emissions



## **CHAPTER SIX**

### **ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN**

#### **6.1 Introduction**

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

#### **6.2 Auditing the ESMMP**

The managers of the project should conduct annual audits to ensure the systems are operating effectively. The audit will ensure that;

- The ESMMP being used is up to date,
- Variations to the ESMMP and non-compliance and corrective actions are documented
- The appropriate environmental training for personnel is undertaken
- Emergency procedures are in place and effectively communicated to the personnel
- A register of major accidents is in place and other documentation related to the ESMMP
- The appropriate corrective and preventive action is taken by the contractor once instructions have been issued.

The environmental management of the proposed project should strengthen the mobilization of the beneficiary communities with regard to environmental and health aspects and render the proposed irrigation project sustainable.

#### **6.3 Responsibilities**

The ESMMP has various components with the respective stakeholders involved towards the implementation of the corrective actions. Various persons and organizations are to be involved in the project. The implementation of the ESMMP should involve the contractors, line ministries, NEMA, various farmer organizations, the local administration, lands Office, KWS, KFS and the consultants

#### **6.4 Training and sensitization.**

Sensitization of all the stakeholders is crucial in the implementation of the ESMMP. All the stakeholders involved in the ESMMP should to undergo environmental awareness training. Training should be aimed at practical aspects of environmental monitoring and management.

**Table 2: Training and sensitization framework.**

Recipients	Mode of training	Environmental aspects to be covered	Agency to train
Environmental staff	Workshops Group discussions Site visits	-Environmental aspects -Environmental regulations -EMPs -Environmental sound construction and management	Environmental and social experts, Supervision consultants
County irrigation Officer operation/ Maintenance staff	Seminar, Workshops	-EMP implementation -Environmental pollution associated with the project -Best environmental practices	Environmental and social experts, Supervision consultants
Contractors' workers	Seminar, Workshops	Environmental overview EIAs Environmental regulations and acts EMPs Environmental pollution	Environmental and social experts, Supervision consultants

### 6.5 ESMP Monitoring

There should be continuous monitoring and follow-up of the project activities to ensure that the ESMMP is implemented and ensure its objectives are achieved. The implementing staff, the community, and the contractor should ensure that the mitigation measures are put in place as outlined in the ESMMP. The monitoring parameters should include improved vegetation cover, increased potential of the various water springs, preservation of species in synergy with the water springs, level of coli form and other bacteria in the sampled water not to forget the ppm solid elements, severity watershed encroachment, public safety and health awareness Malaria and other social disease prevention and control systems in place, livestock wildlife - human conflicts management, safety of equipment and property and capacity building and skills improvement of water users among others as outlined in the ESMMP.

## 6.6 Environmental and Social Management Monitoring Plan (ESM & MP)

### 6.6.1 Environmental and Social Management and Monitoring Plan during Construction phase

No.	Environmental and Social Impact	Proposed Mitigation Measures	Monitoring Indicators	Responsibility	Means of Verification	Time Frame	Est. Cost (KShs.)
<b>Environmental Impacts</b>							
1.	Loss of Flora	<ul style="list-style-type: none"> <li>○ Avoid cutting indigenous trees and vegetation within the survey area path of the water conveyance</li> <li>○ Avoid excessive bush clearing; where possible adopt re-vegetation around the water intakes</li> <li>○ Minimize number of indigenous trees cut</li> <li>○ A forestation and reforestation programs in certain parts of farmlands</li> <li>○ Preserve certain sections for grazing purposes</li> <li>○ The integrity of the forest resources should be well guarded from the spillover effects of the project' activities so as to maintain their functionalities</li> </ul>	<ul style="list-style-type: none"> <li>● % of vegetation cover</li> <li>● No. of trees within the project areas</li> <li>● No of fruit trees planted along the escarpment</li> <li>● % of bush cover around the water intake</li> </ul>	Contractor Community Local forest Associations KFS County Government	Baseline Report Site Report	6 Months	200,000

		<ul style="list-style-type: none"> <li>○ Encourage planting of fruit trees along the escarpment</li> </ul>					
2.	Destruction of Wildlife habitats	<ul style="list-style-type: none"> <li>○ The contractor should retain and protect habitats diversity by conserving them during construction</li> <li>○ The contractor should not excavate the riparian sections since they serve as habitats for several animal species</li> <li>○ The contractor in collaboration with Kenya wildlife services should sensitize the public on the importance of wild life conservation</li> </ul>	<ul style="list-style-type: none"> <li>● The extent of habitat diversity retained</li> <li>● Incidences of invasive species</li> <li>● No. of sensitization meetings on the importance of wildlife conservation</li> </ul>	<ul style="list-style-type: none"> <li>-County Government</li> <li>-Contractor</li> <li>-Farmers</li> <li>-KFS</li> <li>-KWS</li> </ul>	<ul style="list-style-type: none"> <li>Incidence Report</li> <li>Attendance list</li> <li>Photos</li> </ul>	1 Month	50,000
3.	Soil Erosion	<ul style="list-style-type: none"> <li>○ The contractor should ensure that all excavation works are properly compacted</li> <li>○ The contractor should incorporate erosion control measures during construction</li> <li>○ The contractor should not use topsoil during the construction phase</li> <li>○ The contractor should ensure intensive re-vegetation on bare grounds after construction</li> </ul>	<ul style="list-style-type: none"> <li>No. of soil conservation structures established</li> <li>Length of soil conservation structures</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>Supervising Engineer</li> <li>Farmers</li> </ul>	4 Months	Soil and land management plan and Report	100,000

4.	Soil Compaction	<ul style="list-style-type: none"> <li>○ The contractor should ensure that all machines are operated on the existing roads or tracks as much as possible</li> <li>○ The contractor should ensure that there are no unnecessary vehicle movement</li> <li>○ The contractor should avoid compaction during stockpiling by working the soil in its dry state</li> <li>○ The contractor should ensure revegetation on bare ground to reduce run-off</li> </ul>	<ul style="list-style-type: none"> <li>● Reduced Erosion</li> <li>● Reduced suspended dust</li> </ul>	Contractor. Supervising Engineer and farmers	1 week	Site supervision report	50,000
5.	Pollution of river and wetlands	<ul style="list-style-type: none"> <li>○ The contractor should regularly check on the equipment in use to ensure they are well maintained and in good working condition to prevent leaking oils and fuels.</li> <li>○ The contractor should ensure that refueling is done in safe locations where there is no likelihood of spillages</li> <li>○ The contractor should ensure that generated solid waste are disposed in designated site</li> </ul>	<ul style="list-style-type: none"> <li>● No of water test done</li> <li>● No of training conducted on waste management</li> <li>● No of SOPs availed to workers</li> <li>●</li> </ul>	Contractor Supervising Engineer	1 week	Water test report Attendance list Site report	30,000

		<ul style="list-style-type: none"> <li>○ The contractor should ensure that all construction equipment and machineries are clean and mud free</li> </ul>					
6.	Dust and Noise Pollution	<ul style="list-style-type: none"> <li>○ The contractor should ensure that vehicles delivering materials to the site use designated routes and speed limits</li> <li>○ The contractor should ensure there is regular watering of dusty roads and maintenance during this stage.</li> <li>○ The contractor should provide construction workers with dust masks and ear protectors</li> <li>○ The noise levels should be kept at the minimum acceptable levels and the construction activities be confined to the normal 8 am to 5pm working hours</li> </ul>	<ul style="list-style-type: none"> <li>● No. of workers provided with dust mask</li> <li>● No. of times water is sprinkled during excavation</li> <li>● No. of trainings conducted</li> </ul>	Contractor Supervising Engineer	Work Progress Report	1 Month	50,000
7.	Extraction of construction materials	<ul style="list-style-type: none"> <li>○ The contractor should source construction from approved site by the local authorities</li> <li>○ The contractor to ensure adequate re-use of the excavated waste materials</li> <li>○ The contractor should ensure adequate landscaping and backfilling.</li> </ul>	<ul style="list-style-type: none"> <li>● No approved sites for extraction of construction materials</li> <li>● Quantity of excavated materials re-used</li> <li>● % of excavated area backfilled</li> </ul>	Contractor Supervising Engineer	Approval Reports Site reports	4 Months	100,000

		<ul style="list-style-type: none"> <li>○ The contractor should drain depressed areas to prevent breeding grounds for disease vectors</li> <li>○ The contractor should give advance notice to the nearby communities on the intended excavation.</li> </ul>	<ul style="list-style-type: none"> <li>● % of depressed area drained</li> </ul>				
8.	Generation of Solid Wastes	<ul style="list-style-type: none"> <li>○ The contractor should sensitize construction workers on proper disposal of waste</li> <li>○ The contractor should promote reuse, recycling and reduction of wastes</li> <li>○ The contractor should provide adequate litter collection facilities designated in the construction site</li> <li>○ The contractor should ensure that collected waste are disposed in designated licensed sites approved by NEMA in accordance with the waste management regulations</li> <li>○ The contractor should construct a temporary pit latrine for use by workers.</li> </ul>	<ul style="list-style-type: none"> <li>● No. of litter bins</li> <li>● Waste disposal site</li> <li>● Licensed waste handler in place</li> <li>● No of beneficiaries trained on waste disposal</li> </ul>	Contractor Supervising Engineer	4 months	Site Supervision Report	50,000

9.	Generation of Liquid waste	<ul style="list-style-type: none"> <li>○ The contractor should ensure that grey water runoff from the working areas is contained and properly channeled or reused.</li> <li>○ The contractor should ensure that water containing pollutants such as cement, concrete, lime, chemicals and fuels are discharged into a conservancy tank for removal from the site</li> <li>○ The contractor should ensure that potential pollutants are stored, kept and used in such a manner that any escape can be contained to avoid degrading the environment.</li> <li>○ The contractor should ensure that maintenance of vehicles and other machineries are done in designated locations.</li> <li>○ The contractor should ensure regular maintenance of machineries to ensure they are in good working conditions and are free from leaks</li> </ul>	<ul style="list-style-type: none"> <li>● % of grey water run off properly channeled or reused</li> <li>● % of water containing pollutants discharged into conservancy tanks for removal from the site</li> <li>● No of sites designated for maintenance of vehicles</li> <li>● Volumes of contaminated soils scooped and disposed in designated sites</li> </ul>	Contractor Supervising Engineer	Site Report	6 Months	50,000
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		<ul style="list-style-type: none"> <li>○ The contractor should ensure that soil contaminated by oil spills or pollutants are immediately scooped and disposed in designated site</li> </ul>					
	<b>Social Impacts</b>						
10.	Occupation hazards and health risks	<ul style="list-style-type: none"> <li>○ The contractor should comply to all health and safety standards when handling workers on site</li> <li>○ The contractor should provide all workers with appropriate personal protective equipment (PPEs)</li> <li>○ The contractor should establish an assembly area for all workers in case of an accident and maintain a record of all works at the site at each particular time.</li> <li>○ The contractor should sensitize all workers on construction safety measures</li> <li>○ The contractor should provide equipped first aid kits at the site and first aid training given to the</li> </ul>	<ul style="list-style-type: none"> <li>● No of accidents reported</li> <li>● No of fully equipped first AID Kits at strategic points at working area</li> <li>● No of workers with insurance cover</li> <li>● No of PPES provided to workers</li> </ul>	Contractor Supervising Engineer	4 months	Incidence Report Site Report	50,000

		<p>supervisors for handling potential casualties</p> <ul style="list-style-type: none"> <li>○ The contractor should have workmen’s compensation cover to avoid liability in cases of serious accidents.</li> <li>○ The contractor should provide clean sanitary facilities and clean drinking at the site.</li> <li>○ The contractor should ensure that warning signs are erected to warn on construction activities and heavy machinery at site</li> <li>○ The contractor should ensure that risky areas such as deep pits are covered or fenced off to avoid accidents</li> <li>○ the contractor should provide insurance cover to the workers under the employment compensation Act</li> </ul>					
11.	Gender based violence	<ul style="list-style-type: none"> <li>○ The contractor should ensure that that all construction workers are sensitized on GBV</li> <li>○ The contractor should comply with the provisions of the GBV policy to</li> </ul>	<ul style="list-style-type: none"> <li>○ No of beneficiaries trained</li> <li>● Cases of gender based violence reported to local chief</li> </ul>	Social services officer Agriculture staff	Incidence Report Attendance list Site Report	Operation phase	50,000

		<p>safeguard the community against the vice</p> <ul style="list-style-type: none"> <li>○ Training the project beneficiaries on human rights and consequences of gender based violence</li> </ul>					
12.	Increased risk of spread of HIV/AIDS	<ul style="list-style-type: none"> <li>○ The contractor should ensure that that all construction workers are sensitized on prevention and control of STIs/HIV/AIDS</li> <li>○ The contractor should provide adequate prevention measures such as condoms to the community and construction workers</li> <li>○ The contractor should comply with the provisions of the HIV/AIDS prevention policy</li> </ul>	<ul style="list-style-type: none"> <li>● No. of construction workers sensitized on prevention and control of STIs/HIV/AIDS</li> <li>● Level of compliance with provisions of the HIV/AIDS prevention policy</li> <li>● No of prevention measures put in place</li> </ul>	Contractor PHO Supervising Engineer	Incidence report Attendance list Compliance report	6 Months	50,000
13.	Risk of spread of COVID-19	<ul style="list-style-type: none"> <li>○ The contractor should adhere to the standard operating procedure(SoPs) on the prevention of the spread of COVID-19</li> <li>○ The contractor should sensitize the public on COVID-19 government of</li> </ul>	<ul style="list-style-type: none"> <li>● The SoPs in place</li> <li>● No of people sensitized on COVID-19</li> <li>● No. of and washing equipment on site</li> <li>● No of workers provided with hand sanitizers</li> </ul>	Contractor Supervising Engineer Ministry of Health	Incidence report Purchase orders/recep ts Photos	4 Months	100,000

		<p>Kenya regulations to reduce risk of the spread.</p> <ul style="list-style-type: none"> <li>○ The contractor should provide hand washing equipment at strategic points within the site.</li> <li>○ The contractor should provide hand sanitizers in construction site for people to sanitizes their hands</li> <li>○ The contractor and supervising engineer to ensure that participants in the site meetings wear face masks and keep social distance.</li> </ul>	<ul style="list-style-type: none"> <li>● No of workers putting on face masks on site</li> </ul>				
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### 6.6.2 Environmental and Social Management and Monitoring Plan during Operation phase

No.	Environmental and Social Impact	Proposed Mitigation Measures	Monitoring Indicators	Responsibility	Means of Verification	Time Frame	Est. Cost (KShs.)
<b>Environmental Impacts</b>							
1.	Water Quality degradation	<ul style="list-style-type: none"> <li>○ The local agricultural officers' services should train farmers on fertilizer use and the safe use of agrochemicals as well as use of integrated pest management</li> <li>○ The proponent should prepare and implement pest management plan and seek for clearance before commencement of farming activities</li> <li>○ The proponent should ensure proper disposal of wastes</li> </ul>	<p>No. of water testing done</p> <p>No. of farmers using agrochemicals</p>	<p>PMC</p> <p>Farmers</p> <p>Agricultural officers</p>	<p>Water testing report</p>	<p>Operation life of the project</p>	50,000
2.	Soil Salinization , sedimentation and nutrient leaching	<ul style="list-style-type: none"> <li>○ The amount of water abstracted from the river should be controlled through appropriate design of the intake to include facilities for regulating irrigation pipe's discharge</li> <li>○ The Project Management Committee (PMC) should ensure installation of</li> </ul>	<ul style="list-style-type: none"> <li>○ No. of regulating irrigation pipes included in intake design</li> <li>○ No of drainage channels dug and maintained</li> </ul>	<p>PMC</p> <p>Farmers</p> <p>Agriculture Department</p>	<p>Design report</p> <p>Site report</p> <p>Soil salinity monitoring report</p>	<p>Operation life of the project</p>	100,000

		<p>appropriate drainage channels to drain any excess water from the farms.</p> <ul style="list-style-type: none"> <li>○ The proponent should frequently monitor soil salinity through analysis of soil carried out before project implementation and with every annual audit</li> <li>○ Afforestation and vegetation growth should be encouraged especially along the river banks</li> <li>○ The PMC should ensure maintenance and operation of the irrigation infrastructure should be maintained regularly to ensure that localized irrigation does not occur</li> <li>○ The PMC should ensure cultivation limits to the river systems are identified and strictly adhered to.</li> <li>○ The PMC should ensure that there is appropriate terracing where possible</li> </ul>	<ul style="list-style-type: none"> <li>○ No of monitoring visits done on soil salinity</li> <li>○ No of trees planted</li> <li>○ The distance to the river from excavated land</li> </ul>				
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		<ul style="list-style-type: none"> <li>○ The PMC should ensure that water application does not exceed soil intake rate, over- irrigation</li> <li>○ Construction of water pans along the conveyance route to act as silt traps</li> </ul>					
3.	Soil erosion	<ul style="list-style-type: none"> <li>○ There should be erosion control measures on areas prone to erosion especially steep slopes by installing soil erosion control structures</li> <li>○ There should be intensive re-vegetation on bare grounds after construction</li> <li>○ Provide fruit trees to farmers along slopes</li> </ul>	<ul style="list-style-type: none"> <li>○ No. of Sensitization meetings held</li> <li>○ No. of soil conservation structures established</li> </ul>	Agriculture officers. Farmers	Soil and Land Conservation Plan and Report	During and after construction	100,000
	<b>Social Impacts</b>						
4.	Water borne diseases	<ul style="list-style-type: none"> <li>○ The members of the community should be sensitized on preventive and control measures.</li> <li>○ These measures include spraying and use of treated nets for malaria control.</li> <li>○ Construction of pit latrines should be encouraged control diseases.</li> </ul>	<ul style="list-style-type: none"> <li>No of incidences reported</li> <li>No of mosquito nets distributed</li> <li>No of surveillances conducted</li> <li>○ No of farmers boiling and treating water from water pools</li> </ul>	Community PHO	Incidence Report Surveillance Report Report of domestic water use	Project Implementation	50,000

		<ul style="list-style-type: none"> <li>○ The county government should establish additional health facilities as well, equipping and manning the existing ones to deal with the new cases</li> <li>○ The Ministry of public health should ensure there is regular spraying within the project area to control mosquitoes</li> <li>○ Regular flushing of stagnated water to destroy breeding grounds.</li> </ul>					
5.	Water Use Conflict	<ul style="list-style-type: none"> <li>○ The project should consider installation of water troughs at appropriate places for livestock use</li> <li>○ The management of the scheme should ensure fairness in the distribution of irrigation water during the dry season.</li> <li>○ The users should be trained on efficient water use to enable conservation</li> <li>○ The users should also invest in water storage tanks to conserve water.</li> </ul>	<ul style="list-style-type: none"> <li>○ Number of complaints registered</li> </ul>	Community Agricultural officer WRA	Register Water use report	Project operation time	20,000



		<ul style="list-style-type: none"> <li>○ The members should also adhere to by-laws related to water use to reduce wastage</li> </ul>					
6.	Interference of livestock movement paths	<ul style="list-style-type: none"> <li>○ The proponent should organize public meetings to discuss conflicts related with land use in the project area.</li> <li>○ The irrigation infrastructure should be protected by erecting a fence to reduce destruction of crops by livestock.</li> <li>○ There should be a provision of water troughs for livestock outside the scheme in the design</li> </ul>	<p>No. of Public meetings organizes to discuss conflicts</p> <p>No of cattle water troughs provided</p> <p>Level of protection to irrigation infrastructure</p>	<p>PMC</p> <p>Farmers</p> <p>Local administration</p>	<p>Notice of public meetings</p> <p>Attendance list</p> <p>Incidence report</p>	<p>Operation and maintenance phase</p>	50,000
7.	Human-livestock conflict.	<ul style="list-style-type: none"> <li>○ The proponent in collaboration with the department of livestock should sensitize herders and the general community on possible conflicts that may arise</li> <li>○ Fence off the farms to minimize conflicts between farmers, livestock and wildlife</li> </ul>	<p>Number of cases reported in the community.</p>	<p>Local administration</p> <p>-Farmers</p> <p>-WRA</p> <p>- Livestock extension Officers</p>	<p>Reports on resolved cases</p>	<p>Operation and maintenance phase</p>	100,000

		<ul style="list-style-type: none"> <li>○ Provide livestock watering troughs outside the farm to avoid animals straying into the farms</li> </ul>					
8.	Gender based violence	<ul style="list-style-type: none"> <li>○ Training the project beneficiaries on human rights and consequences of gender based violence</li> <li>○ Sensitize the community of importance of sharing resources in the family to reduce tension</li> <li>○ Awareness creation and sensitization of workers and the local communities on the associated dangers and preventive measures</li> </ul>	<ul style="list-style-type: none"> <li>○ No of sensitization meetings</li> <li>○ No of trainings on GBV</li> <li>○ Cases of gender based violence reported to local chief or administration.</li> </ul>	Social services officer Agriculture staff Local administration. Community.	Incidence Report Attendance list	Operation phase	50,000
9.	Risk of spread of COVID-19 among community members	<ul style="list-style-type: none"> <li>○ The proponent should adhere to the standard operating procedure(SoPs) on the prevention of the spread of COVID-19</li> <li>○ The project management committee (PMC) should sensitize the public on covid-19 government of Kenya regulations to reduce risk of the spread.</li> </ul>	<ul style="list-style-type: none"> <li>● The SoPs in place</li> <li>● No of people sensitized on COVID-19</li> <li>● No. of and washing equipment on site</li> <li>● No of workers provided with hand sanitizers</li> </ul>	PMC Ministry of health Farmers	Incidence report Purchase orders/receipts Photos	4 Months	100,000

	<ul style="list-style-type: none"> <li>○ The PMC should provide hand washing equipment at strategic points within the site.</li> <li>○ The PMC should provide hand sanitizers in construction site for people to sanitizes their hands</li> <li>○ The PMC engineer to ensure that participants in the site meetings wear face masks and keep social distance.</li> </ul>	<ul style="list-style-type: none"> <li>○ No of workers putting on face masks on site</li> </ul>				
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### 6.6.3 Environmental and Social Management and Monitoring Plan during decommissioning phase

No.	Environmental and Social Impact	Proposed Mitigation Measures	Monitoring Indicators	Responsibility	Means of Verification	Time Frame	Est. Cost (KShs.)
<b>Environmental impacts</b>							
1.	Generation of solid waste	<ul style="list-style-type: none"> <li>○ The wastes produced should either be reduced reused or recycled</li> <li>○ Provide waste disposal bins at appropriate sites</li> <li>○ Waste disposal sites should be located away from the water sources to prevent the possibility of potential run off into the water system</li> </ul>	Quantity of solid waste in the scheme during decommissioning.	Contractor	Site Report	1 Month	50,000

		<ul style="list-style-type: none"> <li>○ Train the beneficiaries on waste disposal methods including composting</li> </ul>					
2.	Noise pollution	<ul style="list-style-type: none"> <li>○ Reduce noise by sensitizing drivers in the project</li> <li>○ Use manual labor as much as possible.</li> <li>○ Restriction of activities to daytime</li> <li>○ Workers within the vicinity of high level noise to be provided with adequate PPE.</li> <li>○ No idling of vehicles and machinery if not in use, they should be switched off.</li> </ul>	<ul style="list-style-type: none"> <li>○ No of sensitization meetings</li> <li>○ No. of PPE procured</li> </ul>	Contractor	Sensitization Report Attendance list	1 Month	50,000
<b>Social Impacts</b>							
3.	Loss of livelihoods and incomes	<ul style="list-style-type: none"> <li>○ Sensitize and train farmers on livelihood diversification of enterprises.</li> </ul>	No. of people who have suffered lost livelihood and income	Contractor	Livelihood profile report	1 Month	100,000
<b>Total Cost</b>							<b>1,522,000</b>

## **CHAPTER SEVEN**

### **CONCLUSION AND RECOMMENDATIONS**

#### **7.1 Introduction**

This study has been conducted to equip the Government, National Environmental Management Authority (NEMA), the project proponent, Kenya Climate Smart Agriculture Project, project beneficiaries and other stakeholders with relevant and sufficient information about the proposed Irrigation project. It is hoped that NEMA would use this information to give a go ahead to the project by issuing the proponent with a permit. The Irrigation Project proposes to use a gravity fed system which will greatly reduce the operation and maintenance cost. Once the water has been supplied through gravity, the farmers will use sprinkler irrigation to irrigate their farms.

#### **7.2 Conclusions**

The study established that positive impacts will accrue as a result of the implementation of Kipchukuku Irrigation Project. The project will enhance food security in the area which is in line with Vision 2030 where one of the key strategies is to increase agricultural productivity in Kenya and open up idle land to agriculture leading to improved agricultural activities. The key positive socio-economic benefits identified included diversification of farming enterprises leading to improved food security and nutrition in the area ultimately reducing malnourishment. Local production of food will lower prices at the local level therefore making food more available to the people. Lower food prices will make food more affordable in most homesteads. The increase in agricultural related activities will open up the area and there will be improved infrastructure (roads and telecommunication) and social amenities (schools, mosques, churches and dispensaries).

There will be an increase in economic activities in the area leading to an increase in employment along the value chain such as agro-inputs supply, transport, processing and marketing of the farm produce. This will lead to a reduction in poverty levels of many households and improvement of living standards of the locals. It is anticipated that the proposed development project would bring substantial economic benefits not only to the local communities within the project area, but to the entire nation as a whole.

Field surveys and consultative public participation have indicated that there are a few negative socio-economic impacts during the operation and minimal disruption of public services during construction. Adequate Acts, policies and regulations provided in the Environmental

Management Plan and mitigation measures proposed will ensure that the impacts pose no threat to the environment and communities.

### **7.3 Recommendations**

The results from the study showed that there are more positive social and environmental impacts due to the expansion of Kipchukuku Irrigation Project. These positive impacts largely outweigh the potential negative impacts and is therefore recommended for approval and issuance of license by NEMA on condition that all the proposed mitigation measures are implemented throughout the project life cycle.

## REFERENCES

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## ANNEXURES.

### Annex 1: IWUA minutes

#### KIPCHUKUKU IRRIGATION SCHEME

P.O BOX 650 ITEN

#### MINUTES OF KIWUA COMMITTEE MEETING HELD ON 08/04/2020 AT PROJECT MAIN OFFICE

<u>IN ATTENDANCE</u>	<u>ORGANISATION</u>	<u>POSITION/DESIGNATION</u>
1. Leonard Kandie	Kiwua	Chairperson
2. Niculous Kangogo	"	Secretary
3. Philip Barmasop	"	Treasure
4. Thomas Kiplagat	"	Vice Chairperson
5. Geoffrey Kangogo	"	Vice Secretary
6. Salina Yator	"	Committee Member
7. Benwal Kangogo	"	"
8. William Mutwol	"	Area Chief
9. Philemon Barmasop	"	Area Assistant Chief
10. Abraham Kigen	"	Committee Member
11. Ben Kibor	RUSCAP HUN	Co-ordinator
12. Ben Tanui	EIA	Lead Expert
13. Christopher Ruto	"	"

#### AGENDA

1. Water Repairs
2. Collection Of water fee
3. ESIA sensitization and development of environmental social impact assessment

#### PREMBLE

The chairperson welcomed the committee members and visitors from NEMA office to the meeting, the meeting started by a word of prayer then followed by self introduction.

#### MIN 1/ 8/04/2020: WATER REPAIRS

Farmers had early reported that some pipes are leaking at Kaptumo block; the committee had to decide how to call the farmers from Kaptumo block to do excavations. Therefore they resolved that each member from the entire block to pay fee of 200/= to meet the cost of the plumber. This was decided to be done on Saturday 11<sup>th</sup> 04 2020.




#### MIN 2/ 8/04/2020: COLLECTION OF WATER FEE

Treasure reported that last collection, he said that 90% of the farmers have paid their monthly water fees. He further said the rest of the farmers did not pay because their laterals had blockages that need

KIWUA  
P.O BOX 650 ITEN  
08/04/2020



**Annex 2: Attendance list of participants**






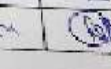







**Kenya Climate Smart Agriculture Project  
(KCSAP)**  
ELGEYO MARAKWET COUNTY

**FARMERS ATTENDANCE LIST**

ACTIVITY... SENSITIZATION AND DEVELOPMENT OF ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT

DATE 08/4/2022 VENUE Kibukukuswa Irrigation Scheme

S/No	NAME	MOBILE No.	ZONE/ VILLAGE	GROUP	SIGN
1	MUSOLAI KANG'OLA	0723797020	KABULWO		
2	GEORGE KANG'OLA	0724349668	KABULWO	KIPUKUKU Irrigation	
3	PHILEAS RUTENGERA	0702798629	KABULWO	MSI Group	
4	ABDULAZIZ KILIANI	0705801546	KABULWO	Committee	
5	SALWA TAJOR	0708461582	KABULWO	Committee	
6	BENNY KANG'OLA	0713693838	KABULWO	COMMITTEE	
7	PHILIP KAMUSOP	072682243	KABULWO	COMMITTEE	
8	THOMAS KIPKACH	0702217965	KABULWO	Chairman	
9	WILLIAM MUTHOKI	0722874113	KABULWO	Chairman	

FARMERS ATTENDANCE LIST DURING FILLING OF ZBIA QUESTIONNAIRES

VENUE: KIPCAKUKU IRRIGATION SCHEME.  
DATE: 26/10/2020

S/ No.	NAME	MOBILE No.	ZONE/ VILLAGE	GROUP	SIGN
1	VIVIAN KIMUTAI	0712885916	SAGAN VILLAGE	BIDIE	
2	FATIM KIPTEGO	0701556867	SAGAN VILLAGE	CHITAI	
3	WATHIE KURGAT	0702857176	SAGAN VILLAGE	BELIOMOO	
4	EDNA KIMUTAI	0798340097	SAGAN VILLAGE	BELIOMOO	
5	CATHERINE KAMUGOYO	0711149739	SAGAN VILLAGE	SAYINLAND	
6	EDNA KIRIRO	0741728945	KAPKAI VILLAGE	BELIOMOO	
7	EDNA KUGEN	0716462576	KAPKAI VILLAGE	BELIOMOO	
8	WINNIE KEMBOI	0759421596	KAPKAI VILLAGE	KATBAI	
9	GLADYS CHEBANG		SAGAN VILLAGE	CHITAI	
10	BETTY KIRBAT		SAGAN VILLAGE	BELIOMOO	
11	ELIZABETH CHEBONG	0112455182	SAGAN VILLAGE	YATIALEL	
12	Benjamin Mwar	0728725158	SAGAN VILLAGE	KIRWASITAN	
13	SILVA CHEMUNO KIRACOS	0720222506	KAPKAI	KIRWASITAN	
14	JIMOTHY KIPROTZ	0719604120	KAMOI B	BIDIE	
15	FRANSTIN KOMIEN	0722620936	KAMOI	KIRWASITAN	
16	CHEBONO KOSGIA	073074194	KAMOI A	TURDI	





S/ No.	NAME	MOBILE NO.	ZONE/ VILLAGE	GROUP	SIGN
1	RACL Shelvia DASH	0715303524	KAPKOI	BELLUNTO	RKL
2	KOECH	0726995625	KAPKOI	KATBEI	Grnt
	Limo	0713179962	KAPKOI		
4	Echiana KaurBad	0724607458	Sagan	Sri Lelanga	ESL
5	Betrice Kembai	0748696098	KAPKOT	Bidii	Cereef
6	Kusni Kuso	092779656	Kapfigie	Bidii	vd
7	BETSI CHEBET	0743084418	KAPKOI		BE
8	SAMERDUS CHELMO	0710253569	KAPKOI	Juhudi	R
9	DORIS CHESANG	0722623754	KAPKOI		BE
10	STEPHE KUMBARA	0716016310	KAPKOI		BE
11	Hosea Kipclumbar	0726786856	KAPKOI	Sri Lelanga	KUMBARA
12	FRANS Kembai	0715378744	Sagan		FRANS
13	Kelvia Kigang	0720087264	KAPKOI	Katbei	K
14	Tonn Ruto	070709833	Sagan	KFA	T
15	Rael Koptea	0713180660	Sagan	KEA	DKL
16	DOROTHY CHEPKUTO	0748140773	Sagan	SOLLALONG	DKL





S/ No.	NAME	MOBILE No.	ZONE/ VILLAGE	GROUP	SIGN
17	HILARY CHEBOT	071796556	KAPKOI	Mokaman	
18	CYNTHIA TANDU	0796524251	KAPKOI	Star Group	
19	BRENDA JEROP	0719971734	SAGAN	Bulu Group	
20	Paul KIPKOGO	0728799573	SAGAN	M. Kibonyi	
21	GEORGINA KIBET	0715604421	KAMPA SAGAN	CHILTAI	
22	MOLVIN ACHENG	0769081160	SAGAN		
23	SOPHIA BARMOSOP	0724269480	SAGAN		
24	SELY KIPKORO	0726490271	KAPKOI	CHILTAI	
25	MERCY RONO	0702529197	SAGAN		
26	BRIAN KIPKOECH	0714711249	SAGAN		
27	Joyce Kasgei	0706309485	SAGAN	KATPEI	
28	Toaithe Kerit	0748514625	KAPKOI	KATPEI	
29	Mercy Charop	0702330206	SAGAN	Soylolang	
30	Esther Kangege		SAGAN	Soylolang	
31	Berina Yator	0740579655	SAGAN	KATPEI	
32	Stella Kimutai	0717412472	SAGAN	Soylolang	



S/ No.	NAME	MOBILE No.	ZONE/ VILLAGE	GROUP	SIGN
1	Titus Wong	0712575526	Kapsokom		
2	PHILEMAN KEMBAL	0707137252	KAPUKUK		
3	JUSTINE KOECH	0796974104	KAMUKUK	JUCOI	
4	GEORGE K LIMO	0703738401	KAPUKU		
5	KOERT CORNELIUS	0724612633	KAPKOI		
6	RISPER BARMOSOP	0795935840	KAPKOI		
7	RISPER KOERT	0720683118	KAPKOI		
8	LINDA KIPILIO	0716032444	KAPKOI		
9	JOHN RUTTO	0707139853	SAGAN		
10	RAEL KIRTOO	0713180660	SAGAN		
11	SORATHY CHEPKUTO	0748440773	KAPKOI		
12	CYNTHIA TANUI	0796324251	KAPKOI		
13	HILARY CHELSON	0719625566	KAPKOI		
14	HILARY CHESEBORN	0710592091	SAGAN		
15	MARY JEAN KEMBAL		KAMUKUK		
16	HARVEY KIPILIO	0715243871	Kapsokom		

S/ No.	NAME	MOBILE No.	ZONE/ VILLAGE	GROUP	SIGN
1.	William Chemureu	0725 660 348	Kapko	Sollalag	
2.	Philamon Kibee	0721749759	Kapko	Juhudi	
3.	Timothy K. CHEPKONGA	0726747724	KAPSOGOM		
4.	Cedrick chemitei	0722139043	Kapko	Sollag	
5.	Charles Kangogo	0722600957	Sagan	Kehulo Jhu	
6.	William Katsomenis	0757088823	Kapko	Kabulo	
7.	Luna Kambogo	0727047004	KAPSOGOM	MIRAKOMI	
8.	ROBERT LMO	0713179962	KOMYKUL	KABULUO	
9.	MESHAK KURUMBI	0712904860	KAPKO	KABULUO	
10.	PHILIP BARUMBA	0726838243	Sagan	KABULUO	
11.	DAVID KANGOGO	0713742283	Sagan	Kabulo KUMMI	
12.	SIMAY BETT	0726127819	Kapko	KABULUO	
13.	ABRAHAM MUGES	0705801846	KAPKO	KABULUO	
14.	JOSPHAT KOMEN	079294668	KAPKO	Kapko	
15.	Richard Kibee	0724662411	Sagan	Kabulo FAMES FUM	
16.	TIMOTHY KOTUN	0792070652	MORJO	SOLLALAG	





### Annex 3: Sample Questionnaire

Qn 26

#### QUESTIONNAIRE

Kenya Climate Smart Agriculture Project, Elgeyo Marakwet County has proposed to expand the existing Kipchukuku irrigation scheme from the current 142 acres to 200 acres by abstracting water from Chebilat river to supplement water from Kipchukuku river. This questionnaire is meant to gather public views on the effect of the proposed project including suggestions on mitigation measures on the negative impacts, ways to enhance positive impacts and any other important information regarding the proposed project.

Information provided by the interviewee will be handled as **CONFIDENTIAL** and shall **NOT BE USED** in other purposes apart from what is stated herein.

#### I: BIO DATA

Name... *GEORGE KAMUKU*...

ID/Phone Number... *0724 344 668*...

Age set.

20 - 30

31 - 40

41 - 50

51 - 60

Over 60

Member of the scheme? Yes  No

#### II: POSSIBLE NEGATIVE IMPACTS OF THE PROPOSED PROJECT

1... *Silt deposition along the water way*

2.....

3.....

4.....

Suggest mitigation measures of the listed impacts

1... *Planting of trees within the waterway*

2... *Planting of Bamboo trees at the intake/abstraction areas*

3.....

4.....

What are the possible conflicts resulting from the project

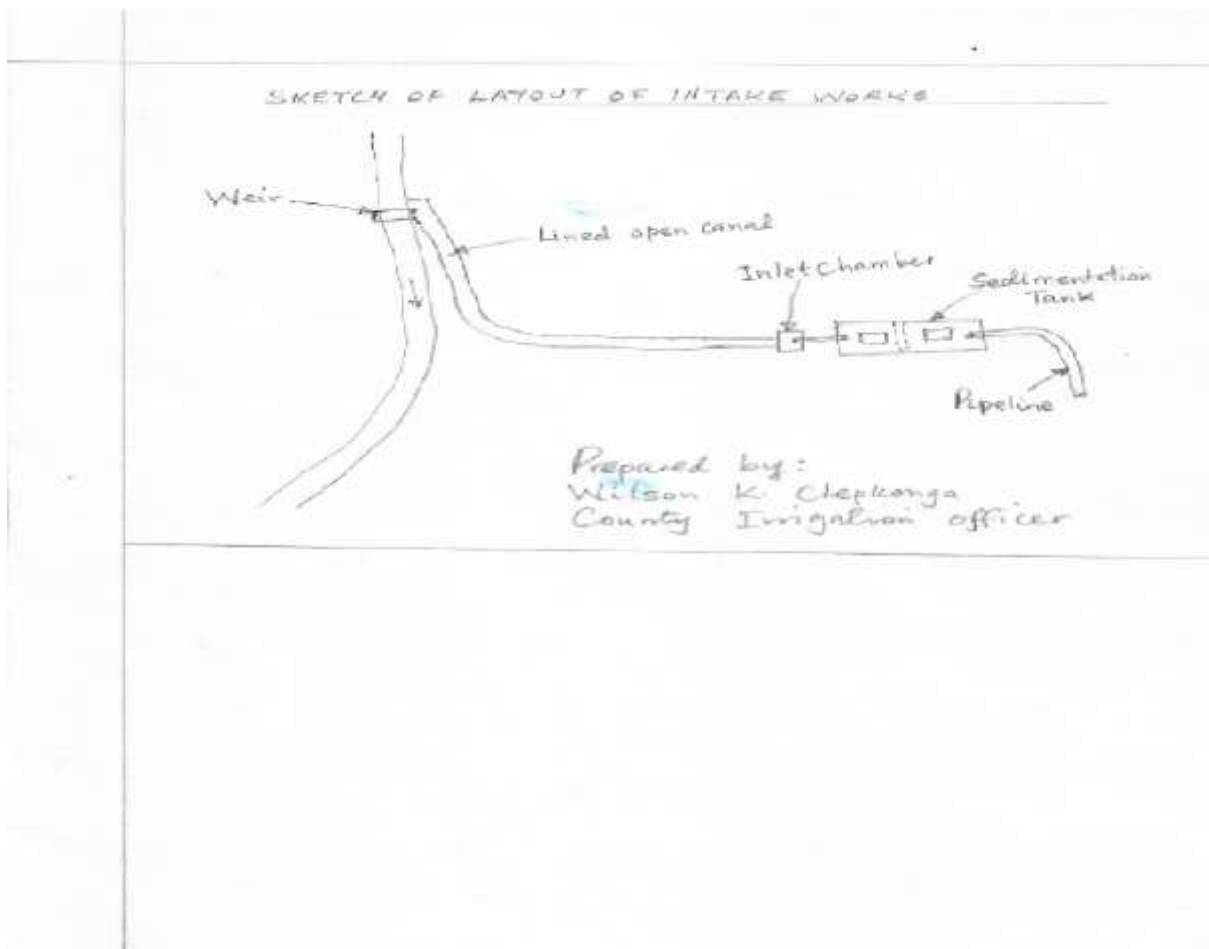
1. ~~Conflict~~ Conflict - Shortage of Water >
2. ....
3. ....
4. ....
5. ....
6. ....

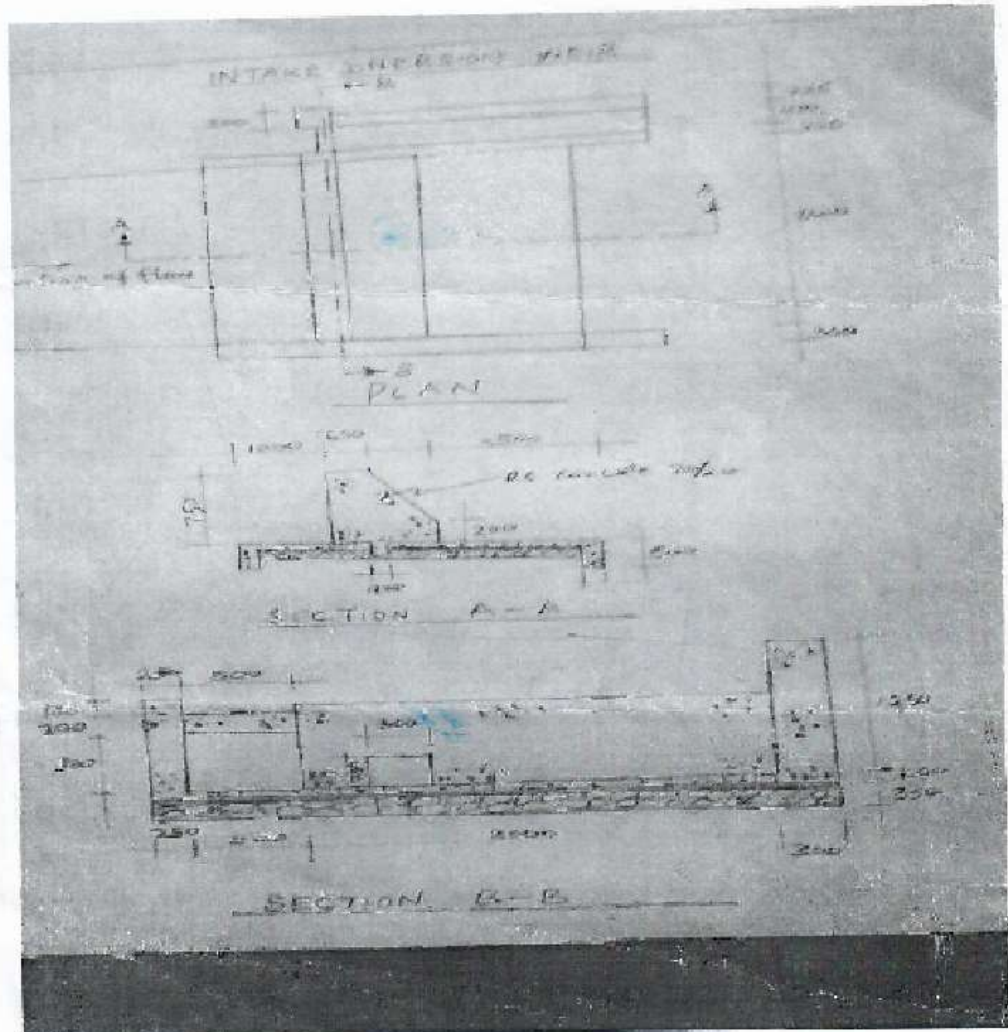
Suggest ways to resolve the conflicts

1. Increase water / Supplementary line from channel stream.
2. Increase the size of the land scheme.
3. ....
4. ....
5. ✓

I  recommend/not recommend the project to be implemented

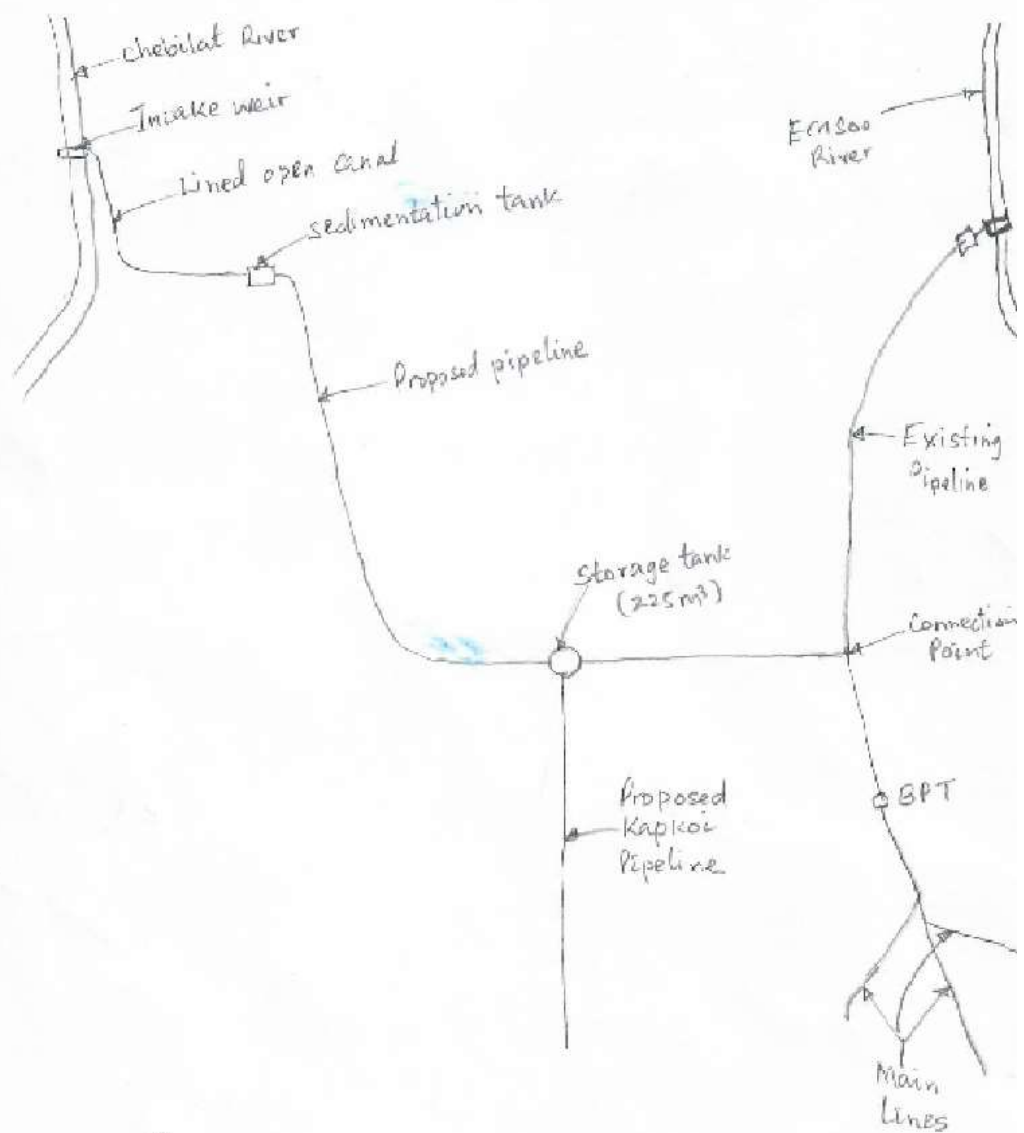
## Annex 4 Sketch of Layout of the Irrigation Scheme





Prepared by:  
 Wilson K. Chepkonga  
 County Irrigation Officer

KIPCHUKURUU IRRIGATION SCHEME - SCHEMATIC LAYOUT (SKETCH)



Prepared by:  
Wilson K. Chepkonga  
County Irrigation officer

## Appendix 5: List of Stakeholders

No	Name of stakeholder	Coverage
1.	Public Health (office in local dispensary)	Location
2.	Beneficiary community	Project catchment area
3.	Provincial administration	Administrative division, location, sub location
4.	Department of Youth and Social Services	Countywide
5.	Department of Lands	Countywide
6.	Department of Agriculture and Irrigation (Irrigation Engineer and Agriculture staff)	Countywide
7.	Department of Livestock ,Elgeyo Marakwet	Countywide
8.	NEMA , Elgeyo Marakwet	Countywide
9.	Department of Roads and Public works	Countywide
10.	Department of water, environment and climate change	Countywide
11.	Ward administrator	Ward
12.	Kenya Forest Services	County wide



**Annex 6: Photos of Public Participation**




Photo 3: Discussions at the intake



Photo 4: Meeting with the Management Committee members



Annex 7: Land ownership letter from the area chief.

  
**OFFICE OF THE PRESIDENT**  
**MINISTRY OF INTERIOR & CO-ORDINATION OF NATIONAL GOVERNMENT**

Telegrams: "DISTRICTER" Iten  
Telephone: (053) 42007  
Fax: (053) 42289  
E-mail: [districter@kenya.go.ke](mailto:districter@kenya.go.ke)  
When replying please quote

CHIEF'S OFFICE,  
KEU LOCATION  
P.O. BOX 650-30700  
ITEN


REF: ..... DATE: 09/05/2017

TO WHOM IT MAY CONCERN,

RE: KIPCHUKUKU IRRIGATION SCHEME LAND OWNERSHIP

This is to confirm that the irrigation scheme mentioned above is a community project covering 90% of Kabulwo sub-location in Keu location. The land ownership is individually owned land, however the area is currently under demarcation. The farmers have been allocated numbers which will later appear as plot numbers when title deeds are issued.

The number of farmers registered under the scheme are 200 (two hundred) who own land individually, each cultivating an acre of land under irrigation.

Thank you,  
Yours faithfully  
  
WILLIAM K. MUTWOKI  
CHIEF

KEU LOCATION  
P.O. BOX 650 ITEN  
Date: 09/05/2017

Annex 8: Letter of no objection from Kenya Forest Service.

# KENYA FOREST SERVICE

Telephone: 0793288607  
email: zmkelyo@kenyaforestservice.org



Ecosystem Conservator,  
Elgeyo Marakwet County,  
P.O. Box 397 – 30700,  
**ITEN.**

When replying please quote

Ref No: KFS/KYO/15/2/2/232

Date: 23<sup>rd</sup> April, 2021

The Chairman,  
Kipchukuku Irrigation Scheme,  
P.O. Box 650,  
**ITEN.**

## **RE: KIPCHUKUKU IRRIGATION SCHEME NO OBJECTION LETTER**

Refer to your letter dated **21<sup>st</sup> April 2021** with no **Ref. No.** This is to confirm that the above project is about 15km away from the gazetted forest reserve and therefore it does not interfere with forest ecosystem and that it's also in line with implementing government policies in Agenda four (4) for food security.

Therefore <sup>the</sup> office has no objection of obstructing water from Chebilat Water Intake to Kipchukuku Irrigation Scheme.

J.C. Kibor  
For Ecosystem Conservator  
**ELGEYO MARAKWET COUNTY**

*Trees for better lives*

Annex 9: Consent letter on way leave by project beneficiaries.



**MINISTRY OF INTERIOR & CO-ORDINATION OF NATIONAL GOVERNMENT**  
**OFFICE OF THE PRESIDENT**

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When replying please quote

CHIEF'S OFFICE  
KEU LOCATION  
P.O. BOX 650 IREN  
KENYA

REF: .....  
DATE: 02/05/2017

TO WATON KIMANI CONLEEN,

RE: WAY LEAVE

The Kipchutukyu Irrigation scheme committee and land owners today visited this office to sign a way leave of piping system from the intake to the scheme to pass through their lands. Attached herewith are the beneficiary farmers of the scheme who have agreed not to raise complaints whatsoever during and after irrigation works. They also agreed not to grow perennial crops and do buildings along the way.

Thank you,  
Yours faithfully  
~~WATON~~  
WILLIAM K. MUTWOL  
CHIEF  
KEU LOCATION  
P.O. BOX 650 IREN  
Date: 02/05/2017





**OFFICE OF THE PRESIDENT**  
**MINISTRY OF INTERIOR & CO-ORDINATION OF NATIONAL GOVERNMENT**

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 When replying please quote

CHIEF'S OFFICE,  
 KEU LOCATION  
 P.O. BOX 650-10700  
 ITEN

DATE: 09/05/2017

REF: .....

LAND OWNERSHIP - WAYLEAVE

<u>NAME</u>	<u>ID NO</u>	<u>SIGN</u>
1. David Kangogo	- 21750373	<i>[Signature]</i>
2. Nixon Cheboi	- 11863889	<i>[Signature]</i>
3. Justice Kutte	- 28619444	<i>[Signature]</i>
4. Michael Chenyot	- 11338051	<i>[Signature]</i>
5. Silas Chemitei	- 27512767	<i>[Signature]</i>
6. Hilkey Cheboi	- 22993708	<i>[Signature]</i>
7. Thomas Chesergon	- 9865371	<i>[Signature]</i>
8. Hilkey Koech	- 29883138	<i>[Signature]</i>
9. Samuel Kangogo Kipkeu	- 10705387	<i>[Signature]</i>
10. Joseph Kipkeu	- 6200420	<i>[Signature]</i>
11. Christopher Kiger	- 0877801	<i>[Signature]</i>
12. Raphael Katam	- 0242649	<i>[Signature]</i>
13. Ednah Kurgat	- 20865331	<i>[Signature]</i>
12. Margret chebi	- 4507665	<i>[Signature]</i>
13. William Kurgat	- 7060381	<i>[Signature]</i>
14. Salina Yator	- 20403697	<i>[Signature]</i>
15. Damaris Chelimo	- 21728593	<i>[Signature]</i>

**CHIEF**  
 KEU LOCATION  
 P.O. BOX 650 ITEN  
 Date: 09/05/2017

