GPS OF SITE: *Latitude 1.59365N, longitude 035.28744E at 1746m asl*

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

SUMMARY PROJECT REPORT



PROPOSED KIKIN IRRIGATIOB SUB - PROJECT IN TAMUGH SUB-LOCATION, TAMUGH LOCATION, SOOK WARD, WEST POKOT SUB-COUNTY IN WEST POKOT COUNTY

Sponsor	Government of Kenya / County Government of West Pokot with support from the World Bank
Client	Kenya Climate Smart Agriculture Project (KCSAP)
Proponent	Kikin irrigation project

FEBRUARY, 2022

CERTIFICATION

For and on behalf of:

Kikin irrigation Sub Project management committee:

This Environmental and Social Impact Assessment Report has been prepared by Dr, Joel Sumukwo; a registered lead expert. The report has been done with reasonable skills, care and diligence in accordance with the Environmental Management and Co-ordination Act, 1999 and the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019. We certify that the particulars given in this report are correct to the best of our knowledge.

LEAD EXPERT

Name of Experts Dr. Joel Sumukwo

NEMA Certificate 11829

Tel.: *+254720322098*

Email.....Sumukwoj@gmail.com.....

Signature.....

Date.....24/2/2022.....

ASSOCIATE EXPERT

Name of Expert: *John K. Kipyegon*

NEMA Certificate No.: *2952*

Address: *P. O BOX 244, KABARNET.*

Tel.: *+254-722283787*

Signature: .....

Date: .....24/2/2022.....

PROJECT PROPONENT

Name of proponent: *Kikin irrigation Sub Project management committee*

Nature of Project: *KIKIN IRRIGATION SUB PROJECT*

Specific site: *TAMUGH LOCATION, SOOK WARD, WEST POKOT SUB COUNTY WEST POKOT COUNTY*

***Coordinates:** Latitude 1.59365N, longitude 035.28744E at 1746m asl*

Name .....THOMAS K. NGIRONYANG.....

Position .....CHAIRPERSON.....

Signature of proponent .....

Date.....23/2/2022.....

Acknowledgement
We wish to thank all those people that have specially contributed to make this report a success. The reviewing teams both at CPCU and NPCU level. Also, we wish to thank the Kikin Community, water engineer, lands department, local administration, agricultural engineering section, sub county water officer, water quality officer (WRA), county director environment, elders, women representative and youth representatives for being instrumental in voluntarily providing the necessary information required in the writing of this report.

Table of Contents

Table of figures

Table of tables

Abbreviations/Acronyms

CESSCO	County Environment and Social Safeguards Compliance Officer
COVID 19	Corona Virus Disease
CPP	Consultation, Public Involvement, and Participation
EA	Environmental Audit
EMCA	Environmental Management and Coordination Act
ESIA	Environment and social impact assessment
ESMMP	Environmental and Social and monitoring Management Plan
GBV	Gender Based Violence
GHG	Greenhouse Gas
GoK	Government of Kenya
GRM	Grievance Redress Management
HIV/AIDS	Human Immune Virus/Acquired Immune Disease Syndrome
KCSAP	Kenya climate Smart Agriculture Project
MoF	Ministry of Finance
MOALF	Ministry of Agriculture, Livestock and Fisheries
NEMA	National Environment Management Authority
NGOs	Non-Governmental Organizations
SEA	Sexual Abuse and Exploitation
SOP	Standard Operating Procedure
WHO	World Health Organization
WRA	Water Resource Authority

EXECUTIVE SUMMARY

The proposed Kikin Irrigation Project is one of the county sub projects that will be implemented by KCSAP in West Pokot County. This project is situated in Kikin village, Tamugh Sub-Location, Tamugh Location, Sook Ward, West Pokot County. The Proposed water source is Kikin River which is a permanent source in the area. The irrigation project is intended to serve a population of 102 households from Kikin village. The recommended system for irrigation is sprinkler considering the topography of the project area. The objective of the proposed Kikin irrigation project is to provide water to irrigate about 100 hectares of land, to grow crops like green grams, beans and other short term high value crops. This will be important in the months of December, January and February which constitute the dry season. The project is intended to supply water to irrigate up to 100 hectares of land. The crops to be grown are beans, green grams, Vegetables, water melons and others. It will also supply water for livestock cattle is 1,289 and goats & sheep are 2500. Apart from supplying water for domestic use at communal water points for about 617 with 102 households according to the 2019 population Census for Kikin village.

The project aims at increasing agricultural productivity, increasing income and build resilience to climate change risks in the targeted smallholder farming and agro-pastoral communities in Tamugh sub location which is in line with KCSAP PDO.The irrigation project is estimated to cost Kshs **46,623,108.** The co-ordinates of the project site is *Latitude 1.59365N, longitude 035.28744E at 1746m asl* According to Environmental (Impacts Assessment and Audit) (Amendment) Regulations, 2019 the proposed project is categorized as a Low risk project based on specific activities to be conducted in the project area and requires a Project report to assess and mitigate impacts on environmental and society.

This Environmental and Social Impact Assessment (ESIA) has been undertaken in compliance with the Kenya Government environmental regulation, EMCA 1999 sections 138 (b) and 58, and the World Bank Applicable Operational Policies. The ESIA process started by screening, followed by scoping, and then the actual ESIA study. The ESIA was carried out using the following methods: community barazas, Key Informant interviews, and administering of individual questionnaires. The public baraza held on 6/9/2021at baraza park near the sub project site and was attended by 57 participants with a proportion of 19 females and 38 males. There were 16 people below the age of 35 while 41 were adults above 35 years. Focused Group Discussions (FGDs) were also held for men, women and the youth. The men FGD had 11 participants, youth had 12 and women 9. Out of 39 questionnaires distributed to the community members in the area 31 were filled in and returned. Illiterate community members sought help from the literate members of the community through translation. A total of 10 key informant respondents were interviewed including key government agencies, local administration, irrigation officials & members, PHD and youth representatives, and VMG representative.

Potential environmental and socio-economic benefits expected from the implementation of the proposed project will comprise; improved household nutritional status and food security, improved access to water for irrigation and livestock consumption, Improved Micro Climate, Water availability for wildlife, Injection of money into the local and national economy, Improved businesses, Revenue generation to the government increased crop productivity, creation of employment, livelihood diversification, market for construction materials, increase in county and national government revenue, and increased business opportunities

The negative environmental impacts of the project comprise disturbance of vegetation, soil erosion, noise and vibration generation, accidents and health and safety concerns.

Socio-economic- cultural impacts of the proposed project are Sub Project mismanagement, Water Related Conflicts, water-borne diseases (human), Social evils and vandalism, spread of

COVID-19, spread of communicable diseases, STIs and HIV/AIDS, sexual exploitation and abuse (SEA) and Gender-based violence at community level.

Summary Proposed Mitigation measures: Key mitigation measures proposed in this report to address the predicted environmental and social impacts are: ensuring safety of workers, through provision of protective clothing and first aid kit, fencing of the sub project site; sensitization of the public on curbing the spread of HIV/AIDS, COVID 19 and other infectious diseases; formation and capacity building of the GRM committee on monitoring and management of SEA/GBV and ensuring that the chosen contractor complies with all SEA/GBV measures put in place. To achieve the proposed mitigation, Contractors to develop SOPs for managing the spread of Covid-19 during project execution and submit them for the approval by the supervision engineer and the Client before mobilizing to site, local community members to be given priority in employment opportunities, in casual and unskilled labour, Proponent to train the local project committee, Social accountability and Integrity Committee (SAIC) and administration on GBV incidences monitoring, Proponent to ensure the Contractor complies with National and WB policies, develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP.

The resultant waste from decommissioning should be sorted into re-recyclables and non-recyclables before disposal at the designated site in accordance with NEMA regulations on Solid Waste. The recyclables could be re-used in new sub-projects or sold to recyclers. The following table summarizes the impacts and associated mitigation measures during the decommissioning phase. The estimated cost of implementing the ESMMP is **Kshs *1,955,000.***

The ESMMP will be implemented by the selected contractor, KCSAP and other stakeholders. The monitoring of the implementation of the ESMMP will be by KCSAP through County Environment and Social Safeguard Officer (CESSCO) and NEMA officers. Considering the positive and negative impacts this project will not result to significant, cumulative, or irreversible negative impacts. All the predicted impacts will be easily mitigated through the proposed ESMMP. The ESIA team, therefore, recommend for approval by the National Environment Management Authority (NEMA) for issuance of an ESIA approval subject to annual environmental audits after operating for one year.

INTRODUCTION

1.1 Background information

The proposed Kikin Irrigation Project is one of the county sub projects that will be implemented by KCSAP in West Pokot County. This project is situated in Kikin village, Tamugh Sub-Location, Tamugh Location, Sook Ward, West Pokot County. The Proposed water source is Kikin River which is a permanent source in the area. The irrigation project is intended to serve a population of 102 households from Kikin village. The recommended system for irrigation is sprinkler considering the topography of the project area. The Project will cover an area of approximately 100 acres. The project aims at increasing agricultural productivity, increasing income and build resilience to climate change risks in the targeted smallholder farming and agro-pastoral communities in Tamugh sub location which is in line with KCSAP PDO.The irrigation project is estimated to cost Kshs **46,623,108.**

1.2 Project objectives

The main objective of the proposed project is to increase crop and livestock productivity, increase income, and build resilience to climate change risks in the targeted smallholder farming and agro-pastoral communities in the proposed site (Tamugh location). specific objective: To boost food security in the area; To increase land size under agricultural and livestock production; To increase fodder production; and to increase livestock and crop diversity

1.3 Project Justification

The major limiting factor to livelihoods in the horn of Africa is inadequate water supply. The low rainfall status is made worse by losses due to run-off and the heavily degraded environment with limited vegetation cover. The chances of drought occurring in parts of the region have increased from a probability of once in every six to eight years to a probability of once in every two-three years based on the data available for the past 50 years (from the early 1960s to the present). During the rains, a lot of water is lost as run-off; percolation is minimal because of environmental degradation accompanied by low vegetation cover. It is therefore important to construct structures to harvest this water for use during the dry periods for both domestic and irrigation. The objective of the proposed Kikin irrigation project is to provide water to irrigate about 100 hectares of land, to grow crops like green grams, beans and other short term high value crops. This will be important in the months of December, January and February which constitute the dry season. The project is intended to supply water to irrigate up to 100 hectares of land. The crops to be grown are beans, green grams, Vegetables, water melons and others. It will also supply water for livestock cattle is 1,289 and goats & sheep are 2500. Apart from supplying water for domestic use at communal water points for about 617 with 102 households according to the 2019 population Census for Kikin village.

1.4 Justification of the Environmental and Social Impact Assessment (ESIA)

The main objective of the ESIA was to identify existing and potential environmental impacts and concerns that the interested and/or affected parties have with the proposed development intervention, as well as the associated prevention and mitigation measures for the negative impacts as stipulated in the proposed Environmental and Social Management Plan (ESMMP).

1.5 The Objectives of ESIA Report

To comply with the Environmental (Impact Assessment and Audit) Regulations, 2003, Regulation 6, which requires that an application for an Environmental and Social Impact Assessment (ESIA) license and applicable World Bank Policies be done; To study the baseline environmental conditions in the project area, such as the physical, biological and socio-economic environment; To study the project conditions and requirements in terms of location, construction and operational requirements;

To assess the anticipated positive and negative impacts (both environmental and social) of the proposed project and develop mitigation measures for the negative/adverse impacts and enhancement measures for the positive impacts during all phases of the project cycle; Prepare an environmental and social and monitoring management plan (ESMMP) as well as an environmental and social monitoring plan for implementation, management and monitoring of mitigation measures along with budgetary estimates, institutional and reporting requirements.

1.6 The ESIA Approach and Methodology

This ESIA began with environmental and social screening, followed by scoping and the actual ESIA study. The study involved the use of several techniques and methodologies which were necessary for collecting and collating baseline information, understanding the legal and policy framework, predicting the potential impacts, assessing the nature of the impacts and determining the order in which the impacts are to be avoided and or mitigated. The team was guided by the requirement of the National Environmental Management Authority (NEMA); Environmental Impact Assessment Guidelines, section 58 of EMCA no. 8 of 1999 and Environmental (Impact Assessment and Audit) Regulations and the World Bank Environment and Social Safeguards policies; Environmental Assessment (OP 4.01). The methods used in the study are discussed below.

1.6.1 Desktop Studies

Desktop studies were conducted to review the already published reports, development plans and maps, and other study reports on the general area as well as projects of similar nature, in order to compile relevant baseline biophysical and socio-economic information about the study area and the proposed project. The biophysical information was compiled on environmental aspects such as flora, fauna, topography, drainage, soils, geology, hydrogeology, and climate. On the socio-economic environment, the studies compiled information on aspects such as population, economic activities, and land use. Desktop analysis of secondary data was undertaken to review past research done on the project area. Documents that were reviewed included among other documents:

The KCSAP Project Appraisal Document (PAD); EMCA no. 8 of 1999; West Pokot County CIDP 2018-2022; 2019 Census Reports Volumes I and II; The World Bank Environment and Social Safeguard Framework; Socio-economic survey reports (2015/16 Kenya Integrated Household Budget Survey (KIHBS); Hydrology Assessment Study Report; The Participatory Integrated Community Development (PICD) reports for the resident Community Driven Development Committees (CDDCs)

1.6.2. Field Site Assessment

Field site visits were carried out for biophysical inspections of the site characteristics and the environmental status of the surrounding areas to determine the anticipated impacts, establish part of the environment to be affected and extent of the impacts. Field site visits were enhanced using observation checklist besides seeking clarification from the local community in the proposed project area.

The purpose of the field site visits was: Obtain available and relevant information and data from the local public offices including Agriculture and Livestock and the Local administration; Evaluate the environmental setting around the proposed project site. Observation focused on topography, land cover, flora and fauna, climate, hydrology of the area and public amenities among others; Evaluate social, economic and cultural setting in the entire project area; Undertake a comprehensive consultative public participation exercise to a large section of the affected persons as well as stakeholders.

1.6.3 Public participation and stakeholder's consultation meetings

This methodology was used to gather direct information from the project beneficiries on the anticipated impacts of the proposed project implementation and the proposed mitigation measures and their way forward. This comes as a compliance with the guidelines by NEMA on carrying out ESIA public consultations before the implementation of any proposed activity. Where public consultations were held the West Pokot KCSAP CESSCO took the lead with all COVID-19 regulations of (social distancing of 1.5-2 metres, sanitization of hands, the number per meeting limited to 12 persons per facilitator and limiting the time of the meeting to one hour. Through public consultations written and oral information was obtained on the benefits, anticipated negative impacts and mitigation measures (refer to Annex 3). The CESSCO and the ESIA lead expert held a stakeholders' consultative forum with technical and lead departments and other key stakeholders. This report has incorporated all the views and suggestions from public participation as shown in chapter 4.

1.6.4 Filled in Questionnaires

This involved the use of a list of questions filled in by the local stakeholders and community members in the project area. Farmers and community members in the project site also filled in personal questionnaires to get their views on the project such as benefits, potential problems and possible solutions and whether they felt the project should be implemented or not. Out of 39 questionnaires distributed to the community members in the area 34 were filled in and returned (annex 2)

1.6.5 Focused Group discussions

Additionally, information pertaining the proposed activity was sought from the community members through focused group discussion for the male and female categories to give their views of concern, the benefits of the proposed activity as well as what they felt should be done to minimize and or avoid the issues of concern. One group discussion for both males, females and youths was conducted refer to annexes 4, 5 and 6 for minutes and attendance lists for FGDs.

1.7 Covid – 19 Infection prevention and control measures

This ESIA project report was undertaken during the (COVID-19) pandemic outbreak. The preparation of the ESIA including the relevant consultations have been undertaken in strict compliance with guidelines set aside by the world health organization aimed at infection prevention and control in the globe. All the protocols provided by WHO through MOH were observed.

1.8 Content of the Report

Following this introductory chapter, Chapter 2 presents the Nature of the proposed project and project activities while Chapter 3 presents the project location. Chapter 4 gives a detailed information on public participation and stakeholders consultation meetings. Chapter 5 discusses in broad the potential environmental and social impacts of the proposed project as well as the mitigation measures towards the proposed negative impacts. Chapter 6 presents the Environmental and Social Management and Monitoring Plan (ESM&MP) while Chapter 7 gives the conclusions and recommendation. Finally, are the References and Annexes.

CHAPTER TWO

NATURE OF THE PROPOSED PROJECT

2.0 Introduction

This chapter presents the project description in terms of site description, project activities, project designs, and estimated project costs.

2.1 The project activities and designs

2.1.1 The proposed project activities

Pre-construction phase

The activities to be undertaken during this stage include;

a) Project design and drawings
b) Acquisition of necessary permits and licenses
c) Community mobilization and sensitization

Construction phase

The activities to be undertaken during this stage include

a) Material acquisition and storage
b) Bush clearing and excavation
c) Construction of the intake/weir structure of height 1.50m high
d) Construction of Sedimentation Basin
e) 500m of 200mm conveyance pipeline 2300m gravity pipeline 1 and 1545m gravity line two from Intake to Tank
f) Mainline, distribution and installation of infield systems including Sprinklers.
g) Three 225m3 masonry tanks and one 50m3 masonry tank
h) Three communal water points and three cattle troughs will be constructed.

Operational phase

The activities to be undertaken during this stage include

a) Bush clearing and land preparation
b) Delineation of irrigable land
c) Supply of farm tools and inputs
d) Construction of soil and water conservation structures

Decommissioning construction phase

The activities to be undertaken during this stage include

a) Preparation of decommissioning plan for submission to NEMA for approval
b) Actual removal of infield systems, conveyance pipes and intake works

The materials required for the proposed activities include; sand, cement, concrete, steel metals, water, hardcore, and construction stones.

2.1.2 The project designs

Refer to Annex 7. The weir, the tanks, and the pipes will be constructed as per the design drawings to ensure quality is upheld.

2.2 Estimated Project Budget

The sub-project is expected to cost approximately Kshs **46,623,108.**

CHAPTER THREE

PROJECT LOCATION

3.0 Introduction

This chapter covers the project location in terms of specific site location, proof of land ownership, any environmental sensitive areas to be affected as well as the physical and biophysical factors.

3.1 site location

The proposed irrigation project is in Kikin village, Tamugh sub-location, Tamugh Location, Sook ward west Pokot sub-county in West Pokot County. The Proposed water source in the proposed site is Kikin stream which is permanent The Proposed intake is Located in Coordinates **(1.59365N, 035.28744E at 1746m asl)**

Figure 1 the sub project site

Plate 2.1: Location of the Proposed Kikin Irrigation Project (Google Maps.)

3.2 Proof of Land Ownership

land ownership in the sub project area and in pokot county is an issue of concern that needs to be addressed to lessen cases of land ownership conflicts. the proposed site is set a site for the sub project through free donation by the community who in this case are the sub project beneficiaries (refer to annex 9 on land documents) (field data 2021)

3.3 Any sensitive environmental areas to be affected

The project is in conformity to the environment and therefore there is no environmental sensitive area to be affected since the area is an agricultural zone and the activity aims at increasing agricultural productivity.

3.4availability of supportive environmental management infrastructure

- Water and sanitation - In the proposed site, the major source of water is River Kikin which is a permanent source and serves the area throughout the year both for domestic and livestock purposes. Other water sources in the area are shallow wells. They comprise; sosion, toptolum, 2 wells in Plongol, 2 in kasarach, and one in kachumakinei villages. Latrine coverage in the proposed site stands at 60% with 40% of the total population using open area of bush defecation method. The latrine types in the area are those constructed using iron sheets and mud, which constitutes 80% of the available latrines while those that are grass thatched, constitutes 20%. Waste disposal in the area is individually done through open fire burning in the urban areas as well as at household level (field data 2021)

- Health facilities - The community gets medical services from Tamugh health centre and two clinics in the local centre. Common diseases in the area include malaria, typhoid, TB, pneumonia and dysentery.

- Transport and communication - Tamugh location is served by the Makutano- Chepareria-Chepnyal all-weather road which is being upgraded to bitumen standard. 19km out of 57.3 kilometres has been tarmacked while the remaining portion is under construction. The road passes through Tamugh sub- location. Electrification is on-going in the area whereby there is electricity line along the road but not connected to the households except for Tamugh health centre. Mobile network is weak for all network service providers in Kenya.
- Energy access - In the proposed project site, 100% use firewood as their source of cooking fuel. For lighting, 100% use torches, 2% use fire while 40% use solar energy. No household so far is connected to electricity **(Source field data 2021)**.

- Trade - A small percent of the population in the proposed area take part in trading activities as their main economic activity. This is because the county is largely a pastoral based economy with Agriculture being practiced in areas that receive adequate rainfall (Source field data 2021).

- Education – the sub project shall benefit the following institutions: ECDE mbelion 300m away, Toptolem 7km, Tamugh km, murkutwo academy 3.5km, kapkimar 3km, chepsekek 1 km, letwa 2.5km: primary scools; Tagumh 2km, murkutwo, Taptolem, kapkimar; secondry schools are: all saints mixed school 2km and Jerusalem girls 3km (field data 2021)

3.5 conformity to land use plan

The sub project is agricultural related and is situated in a rural setting where it shall be used for increasing crop and agricultural productivity.

3.6 Physical Environment

3 .6.1 Climatic conditions

Kikin lies in the AEZ UM4-5, an altitude of about 1700m above sea level and experiences annual mean temperature of 19.2 - 18.0^{o}C. The area receives an annual rainfall of 946mm. UM 4-5 Maize-Sunflower to Livestock-Sorghum Zone. Water is the major limiting factor to crop production in this area; therefore, soil conservation measures are necessary to increase water availability and the responses to chemical fertilizers. Drought tolerant crops like sorghum and green grams should be grown (MURIUKI/QURESHI, p. 110). If farmers have the opportunity to irrigate, they should be encouraged to do that due to considerable higher yields. Pasture and forage1.4-2.0 ha/LU on un eroded natural open semi-dry bushland. On good soils ~ 0.7 ha/LU on artificial Pasture of Rhodes grass, down to 0.28 ha/LU feeding Bana grass, moth bean vines, horse tamarind (Leucaena tricandria), saltbush (Atriplex nummularia) and others; grade cattle possible. Tendency to zone 4 on soils with good water storage capacity on eroded places to zone 5 (or even 6)

3.6.2 Soils

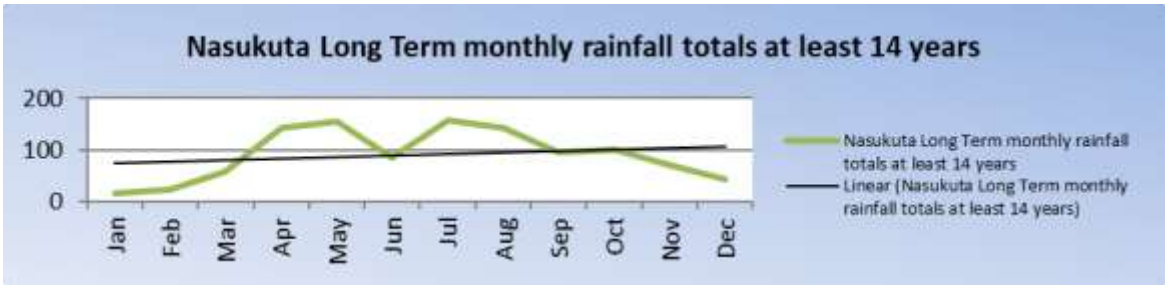
Extreme relief differences are found, caused not only by individual and complex hills and mountains, but also by major and minor scarps in the eastern and western part of the district group. The underlying parent rocks are mainly different types of Basement System gneisses.

The soils in kikin area are Somewhat excessively drained, shallow to moderately deep, reddish brown, friable, rocky and stony, sandy clay loam, MU1(FMHB)

3.6.3Rainfall

Rainfall in this part of west Pokot County generally ranges from 800-1000 mm with mean annual temperatures ranging 19.2.-18^{o}C. The long rains set in as from April to June while the short rains fall as from October to November.

Table 1: Nasukuta long term monthly rainfall totals for at least 14 years



3.6.4 Temperature

The Temperature annual average has maximum temperature of 28.4°c and minimum temperature of 15.8°c.

3.6.5. Evaporation rates (Annual average)

The average annual evaporation rate is 1.6m.

3.6.6. Relative humidity and wind speeds

The relative humidity ranges from 39 to 74 for the last eleven years whereas the average annual wind speed is almost constant at 6m/s.

3.7. Biotic factors

3.7.1 Flora.

The Vegetation is composed of indigenous forest, mainly thorny bushes on steep slopes and valley bottoms. The grass cover is fragile and degradation has taken place over time because of overstocking. The Rift Valley floor is generally unsuitable for agriculture except for a slightly better strip of land near the escarpment and a few irrigation possibilities. But even to graze cattle is difficult today in most places. Overstocking has reduced the grass which competed for water with trees and shrubs. Now the thorny bush has become so dense that cattle have difficulties in penetrating it and there is much less fodder available. The suggestion is to clear it gradually, plant crops by use of irrigation and reseed it with grasses and fodder shrubs. (Field data 2021)

3.7.2 Fauna

The major domesticated animals observed in the sub project area includes; donkey's cattle, sheep, goats and poultry. Wild animals found in the area include hyenas, jackals, leopards, monkeys and baboons. Others include, bird species, reptiles, insect and rodents; squirrels, hyrax, rats etc. The proposed sub-project site is not in a protected area and is not a home to any endangered or threatened animal or plant species. It also does not have a corridor for any wild animals. There is no protected wildlife in the sub project area or any wildlife that has been identified for special protection **(Field data 2021)**

3.8 Socio-Economic Environment Analysis

3.8.1. Economic activities

The area is regarded as mixed farming zone and the livelihoods of the people in proposed project area depend mainly on both crop farming and livestock keeping. Due to decreasing land holding most people are moving towards keeping fewer but quality livestock, like galla goats. Livestock kept include, cattle, goats, sheep and some donkeys. The current estimated livestock in the area for cattle is 8 cows per household and goats & sheep are 25 per household. There are also approximately 300 bee hives in the sub- location as bee keeping is also practiced. 100% of the total population engages in subsistence crop farming and livestock keeping. Of the total population, 1% are employed (casual, menial or on permanent basis). 20% engage in trade and business activities on small-scale basis. (field data 2021)

3.8.2 Demography

The population of the county in the 2019 census was 621,241. This population comprised of 307,013 males and 314,213 females. The population of Pokot North Sub County 2019 is 64780 males and 69702 females. (2019 Census). Tamugh sub-location has a total of 384 households with an average of 6 persons per household. (field Data).

3.8.3: Housing Types

Housing types found in West Pokot county are; grass thatched houses, semi-permanent and permanent houses. In overall, there are 88,026 grass thatched houses, 5,129 permanent and semi-permanent houses. Traditional grass thatched houses (manyattas) are found in most parts of Pokot North and Pokot central Sub-Counties **(Source CIDP 2018-2022).** In the proposed project site, the same scenario is witnessed. 20% of the total households have their structures constructed using grass for the roof and mud for the walls while 78% dwell in semi-permanent structures made of iron sheets for the roof and mud for the walls. There are 8 permanent houses in the area. (field data 2021)

3.8.4 Religious beliefs and cultural practices

The people living here are Christians, it was also found out from the public participation they also had a strong attachment to African traditional religious practices.

3.8.5. Social cultural norms and beliefs

- ✓ Women are not allowed to stand and talk in a meeting when men are present
- ✓ Women are not allowed to make decisions
- ✓ Women are responsible with provision of housing
- ✓ Men take the role of Household Headship according to culture, nevertheless male headed (97%), female headed (2%), child headed (1%)

3.8.6. Conflict and Grievance Resolution Mechanism

Several methods are used in resolving household conflicts in the Pokot community. The instruments used in the resolution of any reported conflicts are.

- ✓ Community leadership structures led by elders (MOKASA). This is a respected body by all members of the community. THEY ALSO INCLUDE THE Nyumba kumi initiate formed by the Government.
- ✓ Religious institutions/ religious leaders
- ✓ Chief/Assistant chief
- ✓ Family heads
- ✓ Non-Governmental Organizations (NGOs)/ Community Based Organizations (CBOs).

Men are the decision makers in the whole process of development in the community. The proposed project shall have a formal Social Accountability and Integrity Committee (SAIC) comprised of three members which will be responsible for the management of conflicts that will arise from the implementation of projects.

The community strongly warned against those who will engage in SEA among their girls and women that they will be given a heavy punishment by the community. However, as a precautionary measure this study has presented these as a possibility in the proposed project and provided adequate mitigation in the chapter on impacts and mitigation and in the ESMMP.

3.9 water demand, availability and quality

3.9.1 Water Availability in Kikin

Kikin river is a permanent source of water but reduces output during the dry months, with a flow rate of about 0.08 M^3/sec during the months of December to March. (estimated flow rate done on site) During these dry months we propose to abstract about 40%- 60% of this amount which is about 0.03- 0.05 M^3/sec (engineers report estimate)

3.9.2 Water Quality

The water is recommended for testing once impounded to ascertain the quality. From observation the water will be fairly good but will not be recommended for domestic use before subjecting it to some kind of treatment. The water will be mainly for irrigation and livestock. The basic requirement for drinking water is that it must be free from pathogenic materials, clear, not saline and contain no compounds that can cause offensive smell *(Source:- Ministry of Water and Irrigation, 2005)*. From field observation there are no signs to indicate salinity as a result of salts in the water. Thus the water quality is suitable for irrigation. It is envisaged that pollution of water will be mainly from run off.

3.9.3 Domestic Water Requirement

Population of Kikin village is 617 people according to 2019 census and an area of 10$km^{2.}$ If implemented fully the project is expected to serve almost 90% of the population.

3.9.4 Livestock Water Requirement

The village has a total number of 1289 of cattle, 1257 sheep and goats and 50 donkeys. The future livestock population cannot be easily predicted due to the varied reasons like insecurity, diseases, rainfall and drought. The livestock population in our calculation for the future and the ultimate water demand calculation remains constant. The livestock unit can be used to estimate the optimum carrying capacity of the kikin village whose area is 10 km^2 or 1000 ha, according to the farm management handbook the carrying capacity of livestock here ranges from 1.4-2ha per LSU. If carrying capacity is used to determine the number of livestock in the area, we get about 500 cattle which is far less than what is on the ground. For purposes of the design we use the current livestock populations.

CHAPTER FOUR

PUBLIC PARTICIPATION STAKEHOLDER CONSULTATION PROCESSES

4.0 Introduction

Kenya government has enshrined the need for public involvement in project development in the Constitution of 2010. This has also been set out in the EMCA, 1999 and Environmental (Impact and Audit) Regulations, 2003. It is also a requirement for Bank funded projects of this magnitude to undergo public participation.

4.1 Categorization of Community Participants and stakeholders

Public participation and stakeholder's meetings conducted targeted all community members of Tamugh sub-location. Preliminary meetings were held with key informants and key stakeholders and follow up meetings in form of community Barazas were held on 31st September 2021. Stakeholders' consultation involved key stakeholders who have an interest in decision making either as individuals or as representatives of a group including people who influence a decision or can influence it, as well as those affected by it. The consultant was helped by the chiefs and local village elders to organize community barazas within Kikin village. The key stakeholders comprised; Officials & members of the proposed irrigation sub project, neighbouring community members, business community officials, department of Physical planning, Department of lands, Departments of Livestock and Agriculture, Public Health, Trade & Cooperative Development, local Administration, KCSAP CPCU, Veterinary officer and ward and sub county administrators. The minutes of the meeting and the list of participants are attached as **annex 3,4,5 and 6**.

4.2 Objective of Public Participation and Stakeholders Participation

The objectives of engaging the community participants and stakeholders in this project include: Build up confidence between the stakeholders and the proponent to minimize the risk of delays in the implementation of the proposed project; Help the project proponent to make informed assessment of public opinion about the project, and the nature and extent of opposition likely to occur during the implementation stage; Bring out the contentious issues and gives a chance to those who may be affected by the proposed project to give their views; Have a fair interaction with affected groups and ensure them that every attempt would be made to minimize the negative impacts of the proposed river bank protection; Get No Objection from the members of the public and the affected community on the implementation of the project.

4.3 Methodology/methods used in public participation and stakeholders' consultation

The methods used in the public participation and consultations were interviews, administering of questionnaires, community meetings (public barazas) and a formal meeting for the government departments. COVID 19 prevention protocols by the ministry of health and WHO were observed during all meetings including sanitizing of hands, proper wearing of face masks and observing the 1.5 social distance. The public baraza was attended by 57 participants with a proportion of 19 females and 38 males. There were 16 people below the age of 35 while 41 were adults above 35 years. (see annex 3 on attendance & minutes for public participation). The public baraza was held on 6/9/2021. Focused Group Discussions (FGDs) were also held for men, women and the youth. The men FGD had 11 participants (see annex 4 on minutes and attendance), youth had 12(see annex 6 on minutes & attendance) and women 9 (see annex 5 on minutes & attendance).

Out of 39 questionnaires distributed to the community members in the area 31 were filled in and returned (refer to annex 2 on sample filled in questionnaires). Illiterate community members sought help from the literate members of the community through translation. A total of 10 key informant respondents were interviewed including key government agencies, local administration, irrigation officials & members, PHD and youth representatives, and VMG representative.

4.4 Summary of Issues Raised by the Community and Stakeholders

The community and other stakeholders raised a range of issues during the public Baraza. The positive impacts identified were; Availability of water for irrigation, Reduction in poverty levels of many households, Employment opportunities, Improvement in living standards, Diversification of farming activities, increased agricultural productivity, Proliferation of business activities, Lower food prices, Improved infrastructure (roads and telecommunication) and social amenities (Schools, dispensaries), Improved agricultural extension services, and exchange of farm produce:

The negative impacts include: increase in human diseases, risks of drowning, encroachment by wild animals, crop-livestock conflicts, pipe destruction by livestock and increase in GBV/SEA. The key issues are summarized in table 2 below.

Table 2: Summary of main concerns raised

ISSUE	ASPECT/CONCERN RAISED BY STAKEHOLDERS	Suggested Mitigation Measure
Accidents	Children and animals falling in the excavated pipeline and being injured.	Provide crossing paths, People and livestock should use the designated crossing areas.
Increase water use	Conflict due to high demand of water use in the farms	The management committee to be trained and rules set on irrigation time schedules for each location
Air pollution	The pipeline excavation will lead to air pollution due to the dust from the excavation site.	Fast completion of the project will ensure a reduction in exposure period for people and livestock, sprinkling water on access paths or avoid over speeding of vehicles at the project site.
Human Diseases	There was concern over increased human diseases from interactions such as COVID & and other infectious diseases	Proponent to comply with all existing COVID 19 control regulations Sensitization on the correct use of mosquito nets and seek medical attention when suspect the infection.

4.5 Grievance Redress Mechanism

A Grievance Redress Mechanism (GRM) is a system by which queries or clarifications about a project are responded to, problems that arise out of implementation are resolved and most importantly – for presentation and resolution of grievances including complaints. The sub-project Social Accountability and Integrity Committee (SAIC) oversees receiving and handling complains/grievances that may emerge during project implementation at the community level. In case the sub-project SAIC committee is unable to handle the grievance raised, they forward to the CPCU. All grievances received will be recorded in the complaint register and mechanism on how the grievance was handled reported and the resolution reached reported.

CHAPTER FIVE

POTENTIAL IMPACTS AND MITIGATION MEASURES

5.0 Introduction

This chapter covers the anticipated impacts and mitigation measures. On one hand, environmental impacts both positive and negative will be discussed while on the other hand social impacts both positive and negative will be discussed. In both cases, mitigation measures that are smart have been provided.

5.1 Environmental impacts

5.1.1Positive environmental impacts and their enhancement measures

a) **Improved Micro Climate**

Horticultural crops, greenhouses, and maize are part of the proposed enterprises within Kikin Irrigation. This will lead to improved vegetation cover within the project area leading to improved micro-climate hence encouraging growth and multiplication of biodiversity in the area.

b) Water availability for wildlife

The project will lead to availability of water for other purposes such as wildlife e.g bees and birds.

c) Injection of money into the local and national economy.

A substantial sum of the sub-project money shall be released into the local economy due to the construction activities. The construction workers will purchase some items such as food stuffs from the local community,
some construction materials will also be sourced locally such as sand that will be used in construction.

d) Improved businesses

The project will require supply of building materials many of which will be sourced locally. This provides ready market for local building material suppliers through the use of locally available materials during the construction phase of the project including; cement, steel metals, sand and ballast. Women will also earn income by selling foodstuffs to the construction workers.

e) Skills transfer

The employment of the skilled personnel will have both from the economic and social point of view. The community members will learn new skills in handling water structures and this will enhance the community skills.

f) Improved access

The project area is a rural setting where roads are not well maintained, with the introduction of the investment, the roads will regularly be maintained to ease access to the irrigation farms as buyers will come from different regions.

g) Revenue generation to the government

The consumption of the construction materials, fuel, oil and others will attract taxes including VAT which will be payable to the government hence increasing government revenue while the cost of these raw

5.1.2 Negative environmental impacts and their mitigation measures

a) Terrestrial ecology /loss of vegetation

Potential impacts are destruction of vegetation along the project routing however, this is insignificant as the project area is mostly rural farms and the pipeline shall traverse

rural areas. *The contractor shall take due diligence while laying the pipes such that minimum disturbance of vegetation is done as much as possible. Procedures for restoration of vegetation on completion of construction shall be part of mitigation measures suggested.*

b) Air pollution

There will be air pollution from the equipment that will be used during the construction and demolition works from dust and exhaust fumes from vehicles and equipment used. This may endanger the health and safety of the workers and the surrounding communities if not mitigated appropriately. The following mitigation measures are recommended for the proposed KIKIN Irrigation Project; *All personnel working on the project will be trained prior to starting construction on methods for minimizing air quality impacts during construction, Construction vehicle drivers will be under strict instructions to minimize unnecessary trips, Exposed stockpiles of such as dust and sand will be enclosed, covered, and watered daily, or treated with non-toxic soil binders, The Contractor will ensure that all workers wear protective gear whenever on duty, The Contractor will ensure that construction machinery and equipment are well maintained to reduce exhaust gas emission, Stop all excavation work if wind threshold velocity has been exceeded, The demolition exercise is be limited to day time only, All debris/wastes should also be collected regularly to control air pollution and injuries.*

c) **Noise Pollution**;

Noise pollution is likely to arise from on-site construction activities especially from machinery and heavy vehicles. This is likely to be noise (short term) to the households living around Kikin Irrigation Project. Mitigation measure: *Using equipment designed with noise control elements where necessary, routing away trucks from noise sensitive areas where feasible at construction site, providing all workers operating in noisy areas or operating noisy equipment with earpieces to protect against extreme noise, install portable barriers to shield compressors, and where feasible minimizing idling time for pickup trucks and other small equipment,*

d) Water and Soil Pollution

Oil wastes may become a source of pollution to the soils and water resources if carelessly handled, stored or drained from construction vehicles and equipment. Project related excavation could lead to surface and ground water quality degradation. Spills of hazardous materials in excavated areas during construction could introduce contaminants to groundwater. This may adversely affect the quality of water for use by the community during the construction phase. The following measures have been proposed to address this impact. *The Contractor will ensure proper disposal off of all construction debris in a sensible manner and not throw it into any of the rivers/stream, supervising engineer to make sure proper diversion of the stream water to create dry area for intake construction, ensuring protection of the riverine ecosystem by proper handling of cement during construction and Prevention of construction materials and others from entering the waterway*

e) Soil Erosion

Destruction of natural vegetation will expose the soil to more erosion. This will be mitigated by planting cover crops and other soil management strategies such as; *Use of soil erosion control techniques which disperse erosive energy and avoid concentrating it by providing good vegetative cover to disperse the energy of rain drops and contour drainage to slow down surface runoff, Proper maintenance of pipeline and the irrigation*

infrastructures, and adoption of conservation tillage systems and ripping to control hardpan and enhance infiltration and seepage

f) Solid Waste Management

With the proposed Kikin-irrigation Project enterprises and operations coupled with the rising population influx, enormous solid waste generation rate is expected. It is therefore proposed that proper waste management strategies be employed and adherence to solid waste management regulations. *Minimization of waste generation will be first priority. However, unavoidable wastes will be separated at source, recycled or re-used, combusted, and disposed in designated and NEMA registered sites*.

5.2 Social impacts

5.2.1Positive environmental and social impacts and their enhancement measures during operation phase

a) Rural Employment Opportunity Creation

The project will provide employment opportunity for both the skilled and unskilled labour. The design and construction phases will require the skills of engineers, environmental experts, foremen, masons and other general labourers. Informal employment will also arise from increased farming activities in the project area during the operation phase.

a. Improved Crop and Livestock Productivity

The availability of water nearby will result in improved livestock health due to reduced walking distance to watering points and increased production of pasture. This being an irrigation, there shall be increased production crops production especially during off season.

b. Improved Standard of Living

Increased livestock and crop productivity will result in improved household income from the sale of agricultural produce resulting in improved standards of living by the households. This will result in the improved quality of life.

c. Improved land value

The increased infrastructural development from the availability of water in the area is anticipated to result to increased property value.

d. Improvement in infrastructure and service provision in the sub project area

The implementation and operationalization of the project is bound to result into improvement of road, electricity, water and telecommunication and other infrastructures and services in the project area.

e. Increased Generation of Revenue to the Government

The expansion of the economy through continuous economic growth and development, is bound to expand government revenue. This will lead to the improvement of service delivery by the government to the community including infrastructure improvement.

f. Improved Community Health

The kikin irrigation sub project will ensure availability of water to the community for irrigation, therefore there shall be production of variety of crops which shall improve human health through improved nutrition.

g. Improved Food Security

Maize, which is Kenya's staple food, is expected to take up to 80% of the sub project. The Irrigation Project will employ improved agricultural technologies.

h. Water availability for irrigation

The pipeline will lead to availability of water for irrigation and this will lead to improved agricultural activities. Availability of water for both domestic use, livestock, bees and other purpose during the wet and dry seasons.

i. Water availability for domestic, livestock and other purposes

The pipeline will ensure a reduction in the distance between the various households and the water collection points as compared to the long distances initially covered from the homesteads to the river.

j. Reduction in poverty levels of many households and improved food security.

This will be because of the availability of more farm outputs that can be sold in the available markets. Food shall be available cheaply.

k. Diversification of farming enterprise

Diversification of farming enterprise leading to improved nutrition.

l. Reduced cost of irrigated farming

The cost of irrigated farming will be reduced, as there will no pumping of water from the river to the farm. The pipeline through gravity system will convey water.

5.3 Anticipated Environmental Impacts in the Operational Phase

1 Solid Waste Generation

The solid waste generated during the operation phase will mainly consist of a few pieces of PVC and metallic materials replacements from repair and maintenance. Use of agricultural chemicals may lead to the waste generation of packing materials and wrappers. Though the magnitude of the generation is anticipated to be low proper management of the waste generated in the operation phase is important. **Mitigation Measure;** Waste should be sorted for recyclables e.g. metals, and plastics for reuse before transportation for disposal to the designated site. Sensitization of farmers on the handling and disposal of packages and wrappers for agricultural chemicals should be undertaken, provide waste skips/ bins on site and Provide sanitation facilities on site

2 Air Pollution

Localized air pollution may occur in farms during spraying of agricultural chemicals to control crop pests and diseases. The impact is of low significance with no cumulative effect. Use of inorganic fertilizers may also result in localized emission of GHGs.

Mitigation Measure; Undertake sensitization of farmers on the safe use and handling of pesticides and other agrochemicals, encourage integrated pest and disease management approaches to prevent emission from agricultural related practices (e.g. encourage the use of organic manure).

3 Disease Outbreak in Humans (water related) and Livestock

Drinking of untreated water from the intake may cause an increase in water related illnesses. Water use for irrigation and domestic may result in stagnant water which would otherwise be a breeding site for mosquitoes and other disease-causing vectors and the resultant outbreak of malaria and bilharzia. Improper use of agrochemicals by farmers such as spraying pesticides without putting on protective equipment may also result to health-related problems. Livestock may also be affected diseases because of drinking contaminated water and converging of livestock in common water points. **Mitigation Measure** Sensitize the community on the use of mosquito nets, Regular disease surveillance by the veterinary department and community, sensitization of the community on disease spread, monitoring and control in livestock, A livestock disease management plan be put in place by the veterinary department to ensure disease incidences are promptly responded to and addressed, Local spraying, bush clearing and drainage of stagnant water near households, Sensitize the community on simple methods of treating water before drinking (e.g. filtering or/and boiling of drinking water, use of aqua tabs), Undertake testing of the water for key parameters.

4 Water Pollution

The following are proposed to prevent or reduce the impacts. Water pollution may result from the use of agricultural chemicals such as pesticides for both crops and livestock by farmers. These chemicals may be washed by rainwater surface runoff into streams or other water resources. The pollution of water may result in pesticide residues and bring about resistance in disease vectors. However, due to the scale of agriculture to be practiced because of the implementation of the proposed subproject the anticipated to be of low significance. The discharge of total suspended solids due to erosion and transport sediments from disturbed areas and potential increase in total suspended solid concentration within the surface water receiver could also be a concern that may have impact on the water quality from the stream. **Mitigation measure;** Sensitize farmers on appropriate integrated pest and disease management practices, Clearance of site after construction, Testing of water for quality analysis, Train farmers on safe use / application of pesticides and cultural methods of pest and disease control, Encourage farmers to have toilets, Conservation and management of the catchment area of kikin River through adoption of SLM practices, Train farmers on farm SLM and The engineering designs to incorporate measures to limit soil erosion and transport of sediments from disturbed areas such as provision of sediment traps, vegetation of disturbed soils and construction of gabions.

5 Intake and movement of aquatic organism's biodiversity

The design of the intake may prevent the movement of aquatic organisms found in the stream. The constructed intake across the river should not inhibit the free movement of the aquatic life in the stream. **Mitigation Measure**. Provide sluice gates for the free movement of aquatic life and Supervising engineer to ensure construction is undertaken as per drawn design

6. Landscape and Visual Impact/loss of aesthetic value of land

Construction of the intake and the concrete water storage tanks may lead to landscape and visual impact. **Mitigation Measure;** Clearance of sites after construction, Landscape management by planting trees/vegetation in constructed areas and Supervising engineer to ensure work site boundaries are not exceeded and no damage is caused in the sub project site

7. Destruction of the intake

Down slope earth material movement such as rock flows or mud flows could result in the destruction of the intake as witnessed in the previous investment by the individual farmer who had initiated the same project. Design of the overflow structure and the transport downstream of boulders and uprooted tree trunks could also cause damage to the intake.

Mitigation measure; Strainers in the form of wire mesh should be provided on all the intake inlets. This will avoid entry of large floating objects into the intake, Slope stabilization and management to be undertaken and the community and proponent in collaboration with KCSAP/county government to undertake reforestation with indigenous plant species to stabilize soils.

8. Soil Erosion

Crops grown in the sub project area include maize, beans, vegetable though in small quantities. The area has potentials of growing; Fruits including mangoes, oranges, passion fruits, horticultural crops and bananas. With the proposed irrigation to be undertaken in the sub project area it is anticipated that farming activities will also increase. This will result in soil erosion in farms especially where inappropriate farming practices are applied. Movement of animals to drinking water troughs will result in tramping of the ground making the soil loose in areas they pass making the soil prone to erosion.

Mitigation Measures; Sensitization of farmers on SLM (e.g. terracing, tree nursery, agroforestry, crop rotation, strip cropping, correct stocking rate, fencing, affruitation) and Sensitizes framers on the importance of having alternative water resources particularly through use of simple water harvesting technologies as alternative source of water for livestock

9. Disturbance of vegetation/trees in farming lands

Farming activities by the farmers in the sub project area could result in the felling of trees and a reduction in the tree cover. The proposed **mitigation** for this impact include; Encourage farmers to have 10% of their land under trees e.g. practice agroforestry and silvopasture, Support farmers to establish community tree nurseries and Encourage famers to practice and the community to continue obeying the set rules by their leaders as has been the tradition of the sub project area.

10. **Flash Flood**

While it is expected that this will be mitigated effectively during implementation, if not properly managed, silting could also cause a significant rise in the water level of the rivers and streams in the sub-project area with ultimate flooding downstream. Destruction of intake works in the stream by stone debris and other materials could weaken the structure and cause flash floods. **Mitigation Measure;** Intake has been designed to convey the range of flows and water levels reasonably expected over the subproject life, Intake to be located at adequate depth to avoid penetration of flooding materials, To prevent chances of excavated soil erosion and transport to nearby streams, all these materials should be re-used during landscaping of the site. The soil should be compacted, and the appropriate vegetation planted to ensure no chances of erosion and silting of the water sources, which could ultimately cause flooding downstream.

5.4 Anticipated Negative Socio-Economic Impacts

1. Increase to exposure to communicable diseases including HIV/AIDS & COVID 19

a. Health Impact-Increase in incidences of HIV/AIDS and STI

The influx of people may bring communicable diseases to the project area, including sexually transmitted diseases (STDs), or the incoming workers may be exposed to diseases to which they have low resistance. This can result in an additional burden on local health resources. The activities for the sub project will not require a workforce camp. Proposed **mitigation measure** for this is; *Contractor to sensitize workers and community members on HIV/AIDS Awareness other communicable diseases to be instituted and implemented as part of the Contractor's Health and Safety Management Plan to be enforced by the Supervising Engineer; Formation of health and safety committees; and Contractor to provide standard quality condoms at the construction site during the construction period.*

b. Health Impact – Spread of COVID-19 amongst construction workers

Since World Health Organization declared COVID-19 a global pandemic various guidance and measures to prevent the spread of the virus. The measures have been adopted worldwide. During sub project execution (civil works), a number of workers will be required to assemble together in meetings, toolbox talks and even at work sites; varied number of workforce including suppliers of material and services are also expected to come in from various places in the country which may be COVID-19 hot spots; and interaction of workers with the project host community will happen as workers find accommodation close to work sites, and/or return to their homes after works. The potential for the spread of any infectious disease like COVID-19 by projects is high. There is also the risk that the project

may experience large numbers of its workforce becoming ill and will need to consider how they will receive treatment, and whether this will impact on local healthcare services including the project host community. During project execution (civil works), large numbers of workers will be required to assemble together in meetings, toolbox talks and even at work sites; varied number of workforce including suppliers of material and services are also expected to come in from various places in the country which may be COVID-19 hot spots; and interaction of workers with the project host community will happen as workers find accommodation close to work sites, and/or return to their homes after works. The potential for the spread of any infectious disease like COVID-19 by projects is high. Recognizing the potent risk this may present, it is difficult to clearly outline exhaustive mitigation measures under the mitigation impacts. As such, there is need for the client and the contractor to develop and adopt COVID-19 Standard Operating Procedure (SOPs) in line with the World Bank guidance, Ministry of Health Directives, and site-specific project conditions. These SOPs need to be communicated to all workers and enforced to the latter without fail. **Mitigation Measures** against spread of COVID-19 amongst workers are: *The Contractors will customize SOPs for managing the spread of Covid-19 during project execution and submit them for the approval of the Supervision Engineer and the Client before mobilizing to site. The SOPs shall be in line with the WHO guidance on COVID-19, Ministry of Health Directives and site-specific project conditions; Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including workers and visitors; Avoid concentration of more than 15 workers at one location; Where there are two or more people gathered, maintain social distancing of at least 2 meters; All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs; The project shall put in place means to support rapid testing of suspected workers for covid-19; Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used; and Ensure routine sanitization of shared social facilities and other communal places.*

c) Social risk - Spread of COVID-19 amongst community members during consultations

During implementation of the ESIA, various consultative activities will be undertaken. For efficient and meaningful engagement, a wide range of individual participants, groups in the local community and other stakeholders will be involved. The types of consultations to be used to pass information shall be through public Baraza's, electronic means shall be used where possible and one-on-one basis meetings while observing the COVID-19 mitigation measures to ensure safety stakeholders involved, the community at large and the client. To minimize the risk of spread of COVID-19 amongst community members, alternative means of consultation will be required as mitigation measures to ensure social distancing and appropriate communication measures. The mitigation measures will be supervised by a communications/ stakeholder engagement / social safeguards expert in the project proponent's team. The proposed **Mitigation Measures** against spread of COVID-19 amongst community members are: *Electronic means of consulting stakeholders and holding meetings shall be encouraged whenever feasible; One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced; Avoid concentrating of more than 15 community members at one location (meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place); Where two or more people are gathered, maintain social distancing of at least 2 meters; The team carrying out engagements within the communities on one-on-one basis will be*

provided with appropriate PPE for the number of people they intend to meet; Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements, and mail) in case of challenge with on line channels; and Disseminate information through digital platform like Facebook, WhatsApp and Chart groups.

c. Gender Based Violence (GBV) among the workers

This impact is triggered during project construction phase when the Contractor fails to comply with the following provisions; gender inclusivity requirements in hiring of workers and entire project management as required by Gender Policy 2011 and 2/3 gender rule and failure to protect human risk areas associated with, disadvantaged groups, interfering with participation rights, and interfering with labour rights. The proposed **Mitigation Measures** of Human Rights and Gender Requirements are; *Contractor to formulate clear human resources policy against GBV for the contract workers aligned with national law (such as 2/3 gender rule); Integrate provisions related to GBV in the employee COC; Ensure appointed personnel to manage reports of GBV according to policy; The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse; The contractor will implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: effective and on-going community engagement and consultation, particularly with women and girls; The contractor will develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to employment; and The contractor will ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project implementation.*

d. Sexual Exploitation and Abuse (SEA)

This impact refers to sexual exploitation and abuse committed by Sub Project staff against communities and represents a risk at all stages of the project, especially when employees and community members are not clear about prohibitions against SEA in the Project.The proposed **Mitigation Measures** to the Risk of SEA include; *Develop and implement a SEA action plan with an Accountability and Response Framework (guided by the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018). as part of the C-ESMP. The SEA action plan will include how the project will ensure necessary steps are in place for: Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials; Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management; Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights; Management and Coordination: including integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle blower protection and investigation and disciplinary procedures; training for all project management; management of coordination*

mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.

e. Gender-based Violence (GBV) at the community level

This impact refers to gender-based violence that women and girls may experience because of Project implementation. This also refers to other GBV-related risks incurred as a result of water and sanitation projects that do not adequately consult women and adolescent girls in the community about safety and security issues related to the delivery of water and sanitation services. The proposed **Mitigation Measures** to Risk of GBV at the community level are. *Develop and implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: effective and on-going community engagement and consultation, particularly with women and girls; review of specific project components that are known to heighten GBV risk at the community level, e.g. employment schemes for women; delivery of water supplies; Specific plan for mitigating these known risks, e.g. sensitization around employment; water services; Ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project implementation; Training of PMC, SAIC, CESSCO and Community (PMC) on GBV and SEA*

2. Increase in Disease Causing Vectors e.g. mosquitoes and water borne diseases

Poor drainage and misuse of the water supplied through the sub project would result to pools of stagnant water resulting to an increase in disease causing vectors such as mosquitoes. This will result in an increase in malaria incidences in the project area. Contamination of the spring water because of poor sanitation in the area would lead to increased incidences of typhoid, diarrhoea and other water borne diseases.
Mitigation Measures; *Monitoring and surveillance of malaria increase by community health workers; Vector control by local community through clearing mosquito breeding grounds and draining stagnant water; Provide proper drainage; Periodic monitoring of water supply for quality checks; Sensitize the local community on the importance of indoor residual spraying (IRS) with insecticides and use of insecticides protected mosquito nets; and Sensitize the community on simple methods of treating water before drinking (e.g. filtering or/and boiling of drinking water, use of aqua tabs)*

3. Increase in Livestock Diseases/Pests and Poor Breed Animals

The coming together of animals from different households and areas would lead to the spread and increase in livestock diseases such as Rift Valley Fever, Foot and Mouth Disease and pests such as ticks. The mixing of the animals would also result to poor livestock breeds due to in breeding. These will have economic impacts in economic terms due to reduced productivity by the animals and poor market prices. **Mitigation Measures;** *Joint and regular disease surveillance and early warning programmes between the veterinary department and local community; Development of disease management plan for coordination of disease response programmes (quarantine, vaccination campaigns); Sensitization of the community on disease spread, monitoring and control; Equipping/rehabilitation of existing livestock facilities (cattle dips).*

4. **Occupational Hazards / Increased work related accidents**

There are likely to be accidents during the construction as well during decommissioning of kikin irrigation project. The safety of workers can therefore be guaranteed through awareness creation on dangers, risks and safety and also training on first aid. It is recommended that this be minimized and or controlled through adoption of effective measures to guarantee the health and safety of all workers. Application of health and safety measures required by law and internationally accepted standards must be ensured and be complied with so as to minimize impacts on health and safety incidences.

Health and safety regulations should be imposed on all the workers. Safety regulations including life and health insurance, first aid kits, protective clothing such as uniforms gloves and helmets will be adhered to. *The Contractor will employ competent people to operate the machines used in order to minimize accident occurrence, all workers be sensitized before the exercise begins, on how to control accidents related to the demolition exercise, a comprehensive contingency plan be prepared before demolition begins, on accident response, adherence to safety procedures be enforced at all stages of the exercise, accordingly insure all workers, pursuant to labour laws, against accidents, all workers be provided and instructed to wear protective attire during demolition, including helmets, and Demolition work be limited to daytime only to avoid workers accidents due to poor visibility*

5. **Population Influx**

Currently the project area is not a human settlement area. Establishment and operation of the project will lead to population influx within the area. People will migrate from the neighbouring areas and other areas to be part of the actors within the Farm's operations. This may lead to culture change and increased conflicts over resources and public and social services. *Development of infrastructure for housing, electricity, domestic water supply, water treatment, roads, sanitation, schools, health facilities among others will be important within the farm so as to support the population increase.*

9. Water management conflicts

Water, being scarce in the sub-project area, the management of the new sub-project could result in prolonged conflicts unless properly formulated. The design of the intake also determines the amount of water that is available to the downstream users not connected to the project. If the design significantly reduces the water available downstream this could be a source of conflict. **Mitigation measure;** The sub project intake will be located and designed so that sufficient quantity of water can be obtained from the intake in all circumstances and leave a balance that is adequate for the downstream users, establishment and registration of Water Resource. User Association (WRUA) for kikin Water Project, training of the WRUA on management, sensitize the community on the importance of meeting project needs personally, record of grievance related to water use and their nature, establish a Grievance committee & sub project accountability and integrity committee meetings, and train the Grievance water committee on resolution of water use related conflicts

10. Population change impacts

This include temporary as in the daily traders who come to purchase farm products, and those who will come to reside and do business in the area. Increase in population may lead to socio-economic impacts in the project area. **Mitigation Measure;** Sensitization of the residence on possibility of the above through public meetings, Provision of social amenities to gather for the increased population and Train the community on the dynamics and the impacts expected.

11. Leadership Issues

Leadership wrangles may result in efficiencies in the implementation of the sub project and result in the loss of the expected goals and outcomes. Identified causes of leadership issues include may include a lack of participatory leadership, poor budgetary system (over-dependence on external support) and self interest in the project. Absence of a water resource user's association and constitution to guide governance may also result in leadership challenges. **Mitigation measures include;** The sub project intake will be located and designed so that sufficient quantity of water can be obtained from the intake in all circumstances and leave a balance that is adequate for the downstream users, Establishment and registration of Water Resource User Association (WRUA) for kikin, training of the WRUA on management and Sensitize the community on the importance of meeting project needs personally

12. vandalism

There is likelihood of vandalizing of the fences and the gabions. **Mitigation measures:** sensitization of the community, involve all the members of the community during all phases of the sub project and establishing of strong community policing on the project.

5.5 Decommissioning of the Sub-project

The circumstances for removing sub project are generally associated with a reasonable desire to return a river to its natural form. The sub-project can be decommissioned when the design period ends or due to one of the following reasons; The source may become inadequate due to unexpected change in climate rendering the sub-project inefficient, other cheaper means of getting water may be developed near the entire or part of the community and other target areas and cause the proponent to close and change to the new source. Under these circumstances, the proponent will demolish all the structures including the intake, remove the piping; salvage materials and restore the sections affected to the original state. The concrete storage tanks may require to be connected to other water sources.

Mitigation measure include; The resultant waste should be sorted into re-recyclables and non-recyclables before disposal at the designated site in accordance with NEMA regulations on Solid Waste. The recyclables could be re-used in new sub-projects or sold to recyclers.

The following table summarizes the impacts and associated mitigation measures during the decommissioning phase.

Table 3: Summary of key impacts and mitigation in the Decommissioning Phase

ENVIRONMENTAL/SOCIAL IMPACTS	MITIGATION MEASURES
Accumulation of solid waste after demolition	Collection and sorting for waste disposal or recycling to ensure NEMA waste management regulation and procedures are followed as required
Aesthetic beauty and possible Soil erosion	Restoration of the affected site e.g. storage tanks, etc. through landscaping and planting vegetation cover
Loss of income for workers and the neighboring community	Sensitize the community on imminent occurrence so that they can absorb the psychological shock without devastating consequences.

CHAPTER SIX:

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

6.0. Introduction

This chapter presents the Environmental and Social Management and monitoring Plan (ESMP) that will be implemented by the proponent to prevent or reduce significant negative impacts to acceptable levels. This plan will be fully followed throughout the sub-project life cycle. Table 4 below shows the ESMMP for the mitigation, monitoring, implementation period and cost for mitigation of the predicted impacts during the implementation of the sub project.

6.1. Environment and Social Management & Monitoring Plan (ESMMP)

Table 4: Environmental and social management & monitoring plan

Impacts	***Mitigation measures***	***Indicators***	***Responsibility***	***Duration***	***Estimated Cost***
Air pollution	*All personnel working on the project will be trained prior to starting construction on methods for minimizing air quality impacts during construction, Construction vehicle drivers will be under strict instructions to minimize unnecessary trips, Exposed stockpiles of such as dust and sand will be enclosed, covered, and watered daily, or treated with non-toxic soil binders, ensure that all workers wear protective gear whenever on duty, The Contractor will ensure that construction machinery and equipment are well maintained to reduce exhaust gas emission,*	*No of people trained on air quality, No. of drivers sensitized, no. of vehicles switched off, no. of vehicles serviced*	*Contractor/CPCU/Proponent*	*6months*	*60,000*
Loss of aesthetic value of land	*Refilling of all quarries and burrow pits to the original state to avoid creating breeding grounds for mosquito and snails, which are agents of transmitting malaria and bilharzias respectively.*	*No of sites refilled.*	*-Contractor*	*3 months*	*20,000*

Loss of vegetation cover	*Minimize number of indigenous trees cutting, Re-afforestation, incorporating soil conservation measures during construction would help to mitigate damage caused by erosion.*	*No. of trees planted, no. of trees removed, no. of conservation measures adopted.*	*-Local forest associations – Contractor, CESSCO, CPCU and*	*12 months*	*170,000*
Soil Erosion	*Minimize number of trees cutting, Re-a forestation, Capacity building on how to practice sustainable Land Management such as minimum tillage and zero tillage because the project area is a fragile ecosystem, Soil management measures should be observed, this will be mitigated by sensitizing the community on proper soil conservation and management measures and provide beehives.*	*No. of trees planted, no. of trees removed, no. of conservation measures adopted, no. of sensitizations done, no. of beehives supplied*	*Agriculture extension officers, Contractor, CESSCO, CPCU, CPOE*	12 months	*230,000*
Siltation of water bodies and Increased turbidity	*Compaction of loose material, sensitization on planting cover crops,*	*No. of sensitizations done, no. of sites compacted*	*Contractor/PoE*	*6 months*	*18,000*
Water and Soil pollution	*The Contractor will ensure proper disposal off of all construction debris in a sensible manner and not throw it into any of the rivers/stream, sensitization of the farmers on waste disposal and proper handling of the farm chemicals*	*No. of disposal sites, no. of sensitization meetings held.*	*Contractor*	*5 months*	*30,000*
Dust Pollution	*Regulate traffic speed and movement, Apply daily water sprays to suppress dust, Provide PPE to construction workers.*	*No. of times sprays applied, no. of drivers obeying traffic rules on speed limits, no. of workers using PPEs*	*Contractor*	*3 months*	*50,000*
Solid waste generation	*Minimization of waste generation will be first priority. However, unavoidable wastes will be separated at source, recycled or re-used, combusted, and disposed in sanitary landfills.*	*No of waste bins*	*Contractor*	*12 months*	*10,000*
Destruction of the intake	*Strainers in the form of wire mesh should be provided on all the intake inlets. This will avoid entry of large floating objects into the intake, Slope stabilization and management to be undertaken and the community and proponent in*	*No. of strainers used, no. of trees planted*	*Community, CPCU, County Government*	*12 months*	*80,000*

	collaboration with KCSAP/county government to undertake reforestation with indigenous plant species to stabilize soils.				
Vandalism	*Surveillance of the sub-project structures and equipment's, Fencing of the water structures and Employment of a local by community to monitor the structures*	*Number or incidences of vandalism, Presence of fence around the water structure or length of fence and Employed person responsible for monitoring structures*	*Contractor/Supervising Engineer Community, Interior and Locational Chief*	*6 months*	*30,000)*
Free movement of aquatic life in the stream	*Provide sluice gates for the free movement of aquatic life, Supervising engineer to ensure construction is undertaken as per drawn design*	*Number of sluice gates provided and Number of visits by the supervising engineer*	*Supervising engineer* *CESSCO/Contractor*	*4 months*	*150,000*
Noise Pollution	*Using equipment designed with noise control elements where necessary, Routing away trucks from noise sensitive areas where feasible at construction site, Providing all workers operating in noisy areas or operating noisy equipment with earpieces to protect against extreme noise, Install portable barriers to shield compressors, Where feasible minimizing idling time for pickup trucks and other small equipment,*		*Contractor*	*3 months*	*100,000*
Proposed negative social impacts					
Increased work related accidents	*Road safety measures will be taken such as extra training for road users and installation of road safety infrastructure like road bumps at strategic locations along the roads, all workers will be sensitized and trained on occupational safety and health issues and on how to control accidents related to field operations, in cases of unavoidable accidents, there will be emergency response provided within the proposed health centre, Adherence to safety procedures be enforced at all stages of the exercise, Accordingly insure all workers, pursuant to labour laws, against accidents, All workers be provided and instructed to wear protective attire*	*No. of trainings and sensitizations done, no. of workers using PPEs, no. of referrals made, no. of works insured.*	*Contractor*	*12 months*	*60,000*

	during demolition, including helmets, Demolition work be limited to daytime only to avoid workers accidents due to poor visibility				
Population influx	*Development of infrastructure for housing, electricity, domestic water supply, water treatment, roads, sanitation, schools, health facilities among others will be important within the farm so as to support the population increase.*	*No. of infrastructure added.*	*Contractor*	*12 months*	*30,000*
Decreased Water Flow	*Unblock (clean collection pipes, take out gravel / filter media and replace it), train local community in the catchment area upstream on SLM, prompt repair of leaks by PMC*	*Frequency of unblocking pipes, no of local communities trained on SLM, no of repairs done.*	*Proponent/PMC* *water officer/CPCU*	*Quarterly/1 year*	*50,000*
Damage to pipeline/vandalism	*Adequate backfilling, fencing the catchment area, use of appropriate pipes (PVC),education of the local community/beneficiaries on project ownership to prevent vandalism*	*Type of pipes used, no of community members & beneficiaries educated on project ownership, area of spring fenced*	*Contractor/works foreman/Proponent/PMC, CPCU/Local administration*	*Quarterly/1 year*	*50,000*
Increase in incidences of STIs and HIV/AIDS	*HIV/AIDS awareness creation seminars and educational programs for all workers and the surrounding community, provision of standard quality condoms at the construction site during the construction period.*	*Number of HIV/AIDS sensitization forums conducted, number of community members and workers sensitized on HIV, no of picking points for condoms*	*Contractor, Proponent, CPCU/CESSCO, Ministry of health, Local administration*	*4 months*	*100,000*
Spread of COVID-19 amongst workers	*The Contractors will develop a Standard Operating Procedures (SOPs) in line with the WHO guidance on COVID-19, Ministry of Health Directives, and site-specific project conditions, mandatory provision and use of appropriate PPE for all project personnel/works/visitors, avoid concentration of more than 15 workers at one location, maintain social distance of 2M,screening of workers daily for temperature & other vital signs, rapid testing of suspected workers for covid-19,installation of handwashing facilities with adequate running water and soap, or sanitizing facilities at strategic points and routine sanitization of shared social*	*No. of SOP(s), no of training material developed, no of PPEs and sanitizing facilities procured, no of sanitation facilities installed e.g. handwashing equipment no of community sensitization on Covid-19 conducted/ number of participants to such community sensitizations*	*Contractor* *Proponent* *CPCU/CESSCO* *PHO*	*4 months*	*75,000*

	facilities and other communal places.				
Spread of COVID-19 amongst community members during consultations processes	*Contractor and proponent to develop SOPs for COVID control, encourage electronic means of consulting stakeholders and holding meetings whenever feasible, one-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced, avoid concentrating of more than 15 community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters, the team carrying out engagements within the communities on one-on-one basis to be provided with appropriate PPE for the number of people they intend to meet, use of traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements, and mail) in case of challenge with on line channels, holding meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration, dissemination of information through digital platform (where available) like Facebook, WhatsApp and Chart groups.*	*No of SOP(s), no of training material developed, no of PPEs purchased and used PPE, no of hand washing & sanitizing facilities, no. of participants registered online, no of people attending community meetings, no of electronic media devices used for information dissemination/engagement e.g. printed electronic mails, addresses of video links created and no of FGDs held for community engagements.*	*Contractor* *Proponent/PMC* *CPCU* *Communication / Engagement expert in project team* *PHO*	*4 months*	*150,000*
Gender Based Violence among workers	*Contractor to formulate clear human resources policy against GBV for the contract workers aligned with national law (such as 2/3 gender rule),integrate provisions related to GBV in the employee COC, appoint personnel to manage reports of GBV according to policy, all personnel engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse, contractor to develop specific plan for mitigating these known risks (sensitization on GBV), contractor to*	*No of policies on GBV formulated, no of GBV provisions in COC, no of personnel appointed to address GBV, no of personnel signed COC, no of plans in place to mitigate known GBV risks, no of referral mechanism in place to address reported GBV incidence from community.*	*Contractor* *Proponent/PMC* *CPCU/CESSCO* *SAIC*	*4 months*	*20,000*

	ensure adequate referral mechanisms are in place in case of reported GBV incidence at community level.				
Sexual Exploitation and Abuse by project workers against community members	*Develop and implement a SEA action plan with an Accountability and Response Framework based on WB Good Practice Note for Addressing GBV in Investment projects, prevention of SEA through signing COCs and sensitization of staff on responsibilities related to the COC, Survivor-centered response to SEA redress mechanism with a multi-sectoral referral and assistance to complainants, staff reporting mechanisms; written procedures related to case oversight, investigation, and disciplinary procedures at the project level, including confidential data management, engagement with the community and development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights; development of contract policies related to SEA, including whistle blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.*	*No of SEA Action Plan, no of staff signed Code of Conduct, no of staff trainings on SEA, no of community Liaison trained in PSEA, no of IEC materials for workers' sites and community, no of SEA reporting pathway, no of relevant policies, e.g. investigations and discipline and whistle blower protection.*	*Supervision Consultant* *GBV Expert*	*1 year*	*150,000*
Gender-based violence at community level	*Effective and on-going community engagement and consultation, particularly with women and girls; review of specific project components that are known to heighten GBV risk at the community level, e.g. employment schemes for women; delivery of water supplies; etc. Specific plan for mitigating these known risks, e.g. sensitization around employment; water services; etc.Ensure adequate referral mechanisms are in place if a case of GBV at the*	*No of consultations with women and girls, no of trainings for PMC, SAIC, CESSCO on GBV and SEA, no of components heightening GBV risk reviewed, no of plans in place to mitigate known risks, no of referral mechanisms in place to address reported GBV cases.*	*Contractor* *Proponent/PMC* *CPCU/CESSCO* *SAIC* *GBV Expert*	*Once/ 4 months*	*100,000*

	community level is reported related to project implementation, training of PMC, SAIC, CESSCO and Community (PMC) on GBV and SEA				
Water Use Conflicts	*Formation and training of Water User's Association (WUA), establishment and training of Grievance redress committee, formulation of bylaws to regulate water use, sensitization of the community on alternative water sources such as rainwater harvesting.*	*No of WUAs formed and trained on water use management, no of GRM formed and trained on water conflict management and resolution, no of by-laws formulated to govern water use, no of households sensitized on rainwater harvesting,*	*Proponent/PMC* *WRA* *CPCU/CESSCO*	*12months*	*100,000*
Increase in Disease Causing Vectors e.g. mosquitoes & water borne diseases e.g typhoid.	*Vector control by local community e.g draining stagnant water, provide proper drainage in all watering points, periodic water quality analysis, sensitize the local community on the importance of indoor residual spraying (IRS) with insecticides and use of insecticides protected mosquito nets, sensitize the community on simple methods of treating water before drinking (e.g. filtering or/and boiling of drinking water, use of aqua tabs)*	*Number of HH using mosquito nets, no of sensitization meetings held on IRS, no of households practicing safety rules, no. of water quality analysis undertaken, no of community members educated on simple water treatment methods*	*Proponent/Department of Veterinary services/CPCU/Department of Public Health/Local administration*	*1 month*	*75,000*
Increase in Livestock Diseases/Pests and Poor Breed Animals	*Joint and regular disease surveillance and early warning programs between the veterinary department and local community, development of disease management plan for coordination of disease response programs (quarantine, vaccination campaigns), sensitization of the community on livestock health and disease management.*	*Number of disease surveillance done, no of sensitization meetings held on livestock health and disease control, no of livestock disease management plan in place & implemented*	*Proponent* *Department of Veterinary services* *CPCU*	*2 months*	*100,000*
Total cost					***1,955,000***

Audits and Reviews: Annual environmental, health, and safety audits and reviews as required by NEMA will be conducted to assess the performance of the environmental, health and safety policies and operational procedures implemented. The CESSCO is expected to carry out quarterly reporting of the sub project together with the M & E officer. These quarterly reports will form the basis for effective auditing and review of the ESMP of the proposed sub project.

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION.

7.1 Conclusion

The key positive socio-economic benefits of construction of Kikin Irrigation are enormous and will address persistent problems of irrigation water shortage that has affected the communities for a long time and expand the acreage of land under agriculture. There will also be improvement of food security for the targeted population. The project will lead to availability of water for both domestic use, the increase in agricultural related activities will open up the area and there will be improved infrastructure (roads) and social amenities (schools, mosques, churches and dispensaries). Field surveys and consultative public participation have indicated that there are a few negative socioeconomic impacts during the operation and some disruption of public services during construction. Adequate mitigation measures have been suggested in the Environmental and social Management & monitoring Plan and mitigation measures proposed to ensure that the impacts pose no threat to the environment and communities. Overall, negative environmental and social impacts due to the Kikin Irrigation are deemed to be largely outweighed by the improved quality of life of the population through its implementation. If the project were not executed, food insecurity would continue being a major challenge in the area leading to low socio-economic status and high poverty levels. Therefore, it is hoped that NEMA would use this information to give a go ahead to the project and issue the proponent with an Environmental Impact Assessment approval.

7.2 Recommendations

Implementation: It is recommended that the Proposed Kikin Irrigation Project be implemented in compliance with all the relevant legislation and planning requirements of Kenya. In line with this, the proponent and the contractor must take the legislative framework provided in this report into consideration, during and after the implementation of the project, as will be appropriate. ***Adherence to ESMMP by all actors during implementation, Annual Environmental Monitoring and Audit*** in compliance with the provisions of the ESIA license and during Operations KCSAP should undertake an environmental audit (EA) of the project, as required by the NEMA and ***Involvement of relevant line ministries*** such as health (water borne diseases), WRA (Water Resource Authority) among others stakeholders. This will ensure that emerging issues are tackled as they come. Water borne diseases that may occur include malaria, bilharzias and typhoid as waterlogging may act as breeding sites for mosquitoes and other bacteria causing vectors. Therefore, there is need for creation of awareness to the public on prevention and control of the diseases and expansion and equipping of existing health facilities to better cope with any outbreaks.

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ANNEX 1: Environmental and social screening checklist

Annex 12A: Environmental and Social screening Check list

ESM Sub-projects Screening Checklist (Prototype)

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

Section A: Background information

Name of County WEST POKOT

Name of CPCU /Researcher PHILIP TINGAA' –CPC

Sub-project location SOOK WARD TAMUGH LOCATION, TAMUGH SUB LOCATION

Name of CBO/Institution K.C.S.H.S

Postal Address: 2-445 KAPENGURIA

Contact Person ~~CHRISTOPHER~~ ~~ABDUKAN~~ P.P Tingaa Cell phone: ~~0705 388977~~ 0729425244

Sub-project name KIKIN IRRIGATION PROJECT FOR CROP & LIVESTOCK PRODUCTION.

Estimated cost (KShs.) 46,673,108

Approximate size of land area available for the sub-project 100 acres

Objectives of the sub project Increase crop and livestock productivity, increase incomes and build resilience of the community

Activities/enterprises undertaken irrigation of crops and pastures

How was the sub-project chosen? Through PICD process and community consultations

Expected sub project duration: 1 yr

Section B: Environmental Issues

Will the sub-project:	Yes	No
Create a risk of increased soil erosion?	✓	
Create a risk of increased deforestation?	✓	
Create a risk of increasing any other soil degradation soil degradation?	✓	
Affect soil salinity and alkalinity?	✓	
Divert the water resource from its natural course/location?	✓	
Cause pollution of aquatic ecosystems by sedimentation and agro-chemicals, oil spillage, effluents, etc.?	✓	
Introduce exotic plants or animals?		✓
Involve drainage of wetlands or other permanently flooded areas?		✓

ANNEX 2: sample filled in questionnaires

STAKEHOLDERS' PERCEPTIONS ON THE POTENTIAL SOCIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED ...KIKAN...IRRIGATION...PROJECT PROJECT AT...WEST...POKOT..... COUNTY

SUB-COUNTY...W:POKOT...WARD...SOOK..... PLOT NUMBER..... LOCATION...TAMUGH SUB-LOCATION...TAMUGH.

This project is anticipated to have effects on the physical, biological and socio-economic environments of the surrounding area and the community. It is important, therefore, to determine these impacts and public participation is a requirement of Environmental Management and Coordination Act, 1999 (Section 58 on Environmental Impact Assessment) in this process. Therefore, as a key stakeholder (i.e. local leader/ surrounding institution or organization/ interested person or group), we request for your comments on the potential socio-economic and environmental impacts of the .....

1. Are you a resident of the proposed project area? Yes [Y], No [ ].
2. How far is your place of residents from the proposed project area? .....
3. For how long have you resided in this area?...SINCE I WAS born.....
4. Are you aware of the proposed project? Yes [Y], No [ ].
5. In your view,
   a) What are the **Positive** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
   ...food consumption and planting of trees along the line.....
   b) What are the **Negative** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
   ...soil erosion.....
   c) How can the negative impacts be mitigated?
   ...because of gulley erosion.....
6. Should the project be implemented? Yes [Y], No [ ].
   If no, why?.....
7. Respondent Name...WILLIAM ADAMAN ID No/phone No...11731515.....
   sign...date.....

THANK YOU FOR YOUR COOPERATION

STAKEHOLDERS' PERCEPTIONS ON THE POTENTIAL SOCIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED ..KIKIN IRRIGATION PROJECT..PROJECT AT..WEST POKOT..... COUNTY

SUB-COUNTY..W/POKOT..WARD..SOOK.... PLOT NUMBER..... LOCATION..TAMUGH SUB-LOCATION..TAMUGH.

This project is anticipated to have effects on the physical, biological and socio-economic environments of the surrounding area and the community. It is important, therefore, to determine these impacts and public participation is a requirement of Environmental Management and Coordination Act, 1999 (Section 58 on Environmental Impact Assessment) in this process. Therefore, as a key stakeholder (i.e. local leader/ surrounding institution or organization/ interested person or group), we request for your comments on the potential socio-economic and environmental impacts of the .....

1. Are you a resident of the proposed project area? Yes [✓] No [ ].
2. How far is your place of residents from the proposed project area? 3 Kilometers
3. For how long have you resided in this area? SINCE BIRTH.
4. Are you aware of the proposed project? Yes [✓] No [ ].
5. In your view,
   a) What are the **Positive** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
   Irrigation for crops will be available, vegetation will be green, There will be availability of food, domestic water for animals will be available.
   b) What are the **Negative** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
   - Water volume will be reduced from the River
   c) How can the negative impacts be mitigated?
   Planting of trees.
6. Should the project be implemented? Yes [✓] No [ ].
   If no, why?.....
7. Respondent Name..Boino Patrick.... ID No/phone No..25163708.....
   sign.....date.....

THANK YOU FOR YOUR COOPERATION

STAKEHOLDERS' PERCEPTIONS ON THE POTENTIAL SOCIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED ..KIKIN....IRRIGATION....PROJECT PROJECT AT WEST ..POKOT..... COUNTY

SUB-COUNTY..W/POKOT...WARD..SOOK..... PLOT NUMBER..... LOCATION..TAMUGH SUB-LOCATION.....TAMUGH.

This project is anticipated to have effects on the physical, biological and socio-economic environments of the surrounding area and the community. It is important, therefore, to determine these impacts and public participation is a requirement of Environmental Management and Coordination Act, 1999 (Section 58 on Environmental Impact Assessment) in this process. Therefore, as a key stakeholder (i.e. local leader/ surrounding institution or organization/ interested person or group), we request for your comments on the potential socio-economic and environmental impacts of the .....

1. Are you a resident of the proposed project area? Yes [ ], No [ ].
2. How far is your place of residents from the proposed project area? .....
3. For how long have you resided in this area?.....Vil. born.....
4. Are you aware of the proposed project? Yes [ ], No [ ].
5. In your view,
   a) What are the **Positive** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
   .....Poverty.....No.....
   .....
   b) What are the **Negative** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
   ..Soil.....Erosion.....Mosquitoes/.....Locusts.....
   .....
   .....
   c) How can the negative impacts be mitigated?
   ..Planting.....of.....trees/.....Afforestation.....
   .....
6. Should the project be implemented? Yes [ ], No [ ].
   If no, why?.....
7. Respondent Name.....Mark Lotuka..... ID No/phone No.....22542652
   sign.....date.....

THANK YOU FOR YOUR COOPERATION

STAKEHOLDERS' PERCEPTIONS ON THE POTENTIAL SOCIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED ..KIKIN IRRIGATION PROJECT PROJECT AT...WEST POKOT..... COUNTY

SUB-COUNTY...W: POKOT...WARD...Sook.... PLOT NUMBER..... LOCATION...Tamugas SUB-LOCATION...TAMUGAS...

This project is anticipated to have effects on the physical, biological and socio-economic environments of the surrounding area and the community. It is important, therefore, to determine these impacts and public participation is a requirement of Environmental Management and Coordination Act, 1999 (Section 58 on Environmental Impact Assessment) in this process. Therefore, as a key stakeholder (i.e. local leader/ surrounding institution or organization/ interested person or group), we request for your comments on the potential socio-economic and environmental impacts of the .....

1. Are you a resident of the proposed project area? Yes [✓], No [ ].
2. How far is your place of residents from the proposed project area? ...Within the area
3. For how long have you resided in this area?...since I was born.....
4. Are you aware of the proposed project? Yes [✓], No [ ].
5. In your view,
   a) What are the **Positive** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
   ...Food Consumption and Planting of trees...
   b) What are the **Negative** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
   ...Soil Erosion...
   c) How can the negative impacts be mitigated?
   ...because of gulley erosion.
6. Should the project be implemented? Yes [✓], No [ ].
   If no, why?.....
7. Respondent Name...TALUK STEPHEN... ID No/phone No..25889095.....
   sign...Sign...date.....

THANK YOU FOR YOUR COOPERATION

STAKEHOLDERS' PERCEPTIONS ON THE POTENTIAL SOCIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED ....KIKIN IRRIGATION PROJECT....PROJECT AT....WEST POKOT.... COUNTY

SUB-COUNTY.W/POKOT WARD....SOOK.... PLOT NUMBER..... LOCATION.TAMUGH.... SUB-LOCATION.....TAMUGH

This project is anticipated to have effects on the physical, biological and socio-economic environments of the surrounding area and the community. It is important, therefore, to determine these impacts and public participation is a requirement of Environmental Management and Coordination Act, 1999 (Section 58 on Environmental Impact Assessment) in this process. Therefore, as a key stakeholder (i.e. local leader/ surrounding institution or organization/ interested person or group), we request for your comments on the potential socio-economic and environmental impacts of the .....

1. Are you a resident of the proposed project area? Yes [ ], No [ ].
2. How far is your place of residents from the proposed project area? .....
3. For how long have you resided in this area?...2km.....meters.....
4. Are you aware of the proposed project? Yes [ ], No [ ].
5. In your view,
   a) What are the **Positive** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
      (1)..Conducive...environment...due...to...farming...available.....
      (2)..Availability...of...soil...due...to...erosion.....
      (3)..Uniting...of...economic...as...the...community.....
   b) What are the **Negative** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
      (1)..The...water...shrine...will...dry...up...without...trees.....
      (2)..If...the...rain...is...to...high...there...will...be...run...of...soil..
      .....
   c) How can the negative impacts be mitigated?
      (1)..Planting...of...trees.....
      .....
6. Should the project be implemented? Yes [✓], No [ ].
   If no, why?.....
7. Respondent Name.David...Pkapal..... ID No/phone No..37590923.....
   sign.....date.....

THANK YOU FOR YOUR COOPERATION

STAKEHOLDERS' PERCEPTIONS ON THE POTENTIAL SOCIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED ...KIKIM IRRIGATION PROJECT...PROJECT AT...WEST POKOT... COUNTY

SUB-COUNTY...WEST...WARD...SOOK... PLOT NUMBER..... LOCATION...TAMUGH...SUB-LOCATION...TAMUGH...

This project is anticipated to have effects on the physical, biological and socio-economic environments of the surrounding area and the community. It is important, therefore, to determine these impacts and public participation is a requirement of Environmental Management and Coordination Act, 1999 (Section 58 on Environmental Impact Assessment) in this process. Therefore, as a key stakeholder (i.e. local leader/ surrounding institution or organization/ interested person or group), we request for your comments on the potential socio-economic and environmental impacts of the .....

1. Are you a resident of the proposed project area? Yes [✓], No [ ].
2. How far is your place of residents from the proposed project area? .....
3. For how long have you resided in this area?...200 meter.....
4. Are you aware of the proposed project? Yes [✓], No [ ].
5. In your view,
   a) What are the **Positive** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
   1. Conducive environment due to forestry available
   2. Availabilities of economic for the community
   3. Holding of Soil due to Soil erosion
   b) What are the **Negative** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
   1. The water Strime will dry up without trees
   2. If the rain is to high there will be run of Soil
   c) How can the negative impacts be mitigated?
   1. Planting of trees
6. Should the project be implemented? Yes [✓], No [ ].
   If no, why?.....
7. Respondent Name...Joshua L. Imana... ID No/phone No...33473813.....
   sign....Fled.....date.....

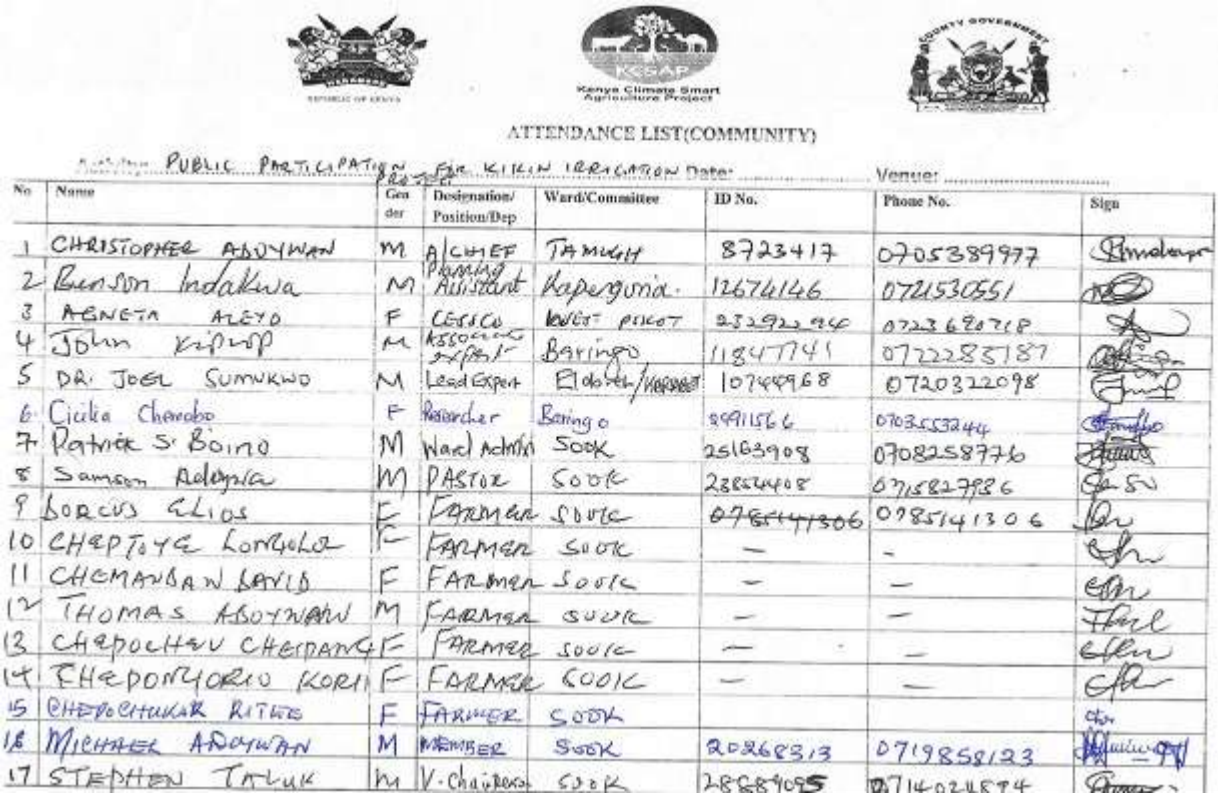
THANK YOU FOR YOUR COOPERATION

ANNEX 3: Minutes and Attendance list for public participation

ATTENDANCE LIST(COMMUNITY)

Activity: PUBLIC PARTICIPATION FOR KILKIN IRRIGATION PROJECT Date: 6/9/2021 Venue: KILKIN

No.	Name	Gender	Designation/ Position/Dep	Ward/Committee	ID No.	Phone No.	Sign
01	NGIKONTANG K. THOMAS	M	CHIEF	SOOK	25274113	0708912315	
02	MARK POLEMUNTANG	M	SECRETARY	SOOK	22572210	0782373704	
03	KACHAPIN MUSA	M	FARMER	SOOK	35546191	0798512269	
04	JOSPHAT L KIRAA	M	FARMER	SOOK	33473813	0786754245	
05	WILLIAM ADOYWAN	M	FARMER	SOOK	11913151	0790031292	
06	JAMES ADOYWAN	M	FARMER	SOOK	07	0728908492	
07	KORII CHEIPONG	M	FARMER	SOOK	9700176	-	
08	DAVID MOIKEL	M	FARMER	SOOK	23557486	0740667557	
09	LORENG'AKUSA REBECCA	M	FARMER	SOOK	—	—	
10	PAUL NGOLE	M	FARMER	SOOK	—	—	
11	DAVID APOPOL	M	FARMER	SOOK	37590923	0782047858	
12	DICKSON PAITEMYANG	M	FARMER	SOOK	—	—	
13	LOCHIAN TOLELIWYANG	M	MEMBER	SOOK	—	—	
14	CHEPANT P MOSES	M	Member	Sook	35211561	-	
15	CHEPOCHEWU MOSES	F	Member	Sook	-	-	
16	CHEPOKMUK MICHAEL	F	MEMBER	SOOK	29238049	0783 353555	
17	DOMTILA CHEPOCHEWU	F	MEMBER	SOOK	13259785	0751 718874	



ATTENDANCE LIST(COMMUNITY)

Activity: PUBLIC PARTICIPATION FOR KILKIN IRRIGATION PROJECT Date: Venue:

No	Name	Gender	Designation/ Position/Dep	Ward/Committee	ID No.	Phone No.	Sign
1	CHRISTOPHER ADOYWAN	M	A/CHIEF	TAMUGH	8723417	0705389977	
2	Benson Indakwa	M	Planning Assistant	Kapenguria	126741146	0721530551	
3	AGNETA ALEYO	F	CESSCO	WEST POKOT	232923946	0723690718	
4	John Kiplop	M	ASSOCIATE EXPERT	Baringo	11847741	0722285187	
5	DR. JOEL SUMUKWO	M	Lead Expert	Elgeyo/Marakwet	10749968	0720322098	
6	Cicilia Charoba	F	Researcher	Baringo	8991566	0703553244	
7	Patrick S. Boino	M	Ward Admin	SOOK	25163908	0708258776	
8	Samson Adeyma	M	PASTOR	SOOK	28824408	0715827986	
9	BORCUS ELIOS	F	FARMER	SOOK	0768441306	0985141306	
10	CHEPTOYE LONGOLO	F	FARMER	SOOK	—	-	
11	CHEMANDAN DAVID	F	FARMER	SOOK	—	—	
12	THOMAS ADOYWAN	M	FARMER	SOOK	—	—	
13	CHEPOCHEW CHEIPANG	F	FARMER	SOOK	—	—	
14	CHEPONGORIO KORI	F	FARMER	SOOK	—	—	
15	CHEPOCHUKAR RITHO	F	FARMER	SOOK			
16	MICHAEL ADOYWAN	M	MEMBER	SOOK	20268313	0719858123	
17	STEPHEN TALUK	M	V-Chairman	SOOK	28689095	0714024874	

Project ESIA Minutes for the proposed construction of Kikin irrigation Scheme in Tamugh Sub-location Public Participation and Stakeholders consultation meeting held at the proposed site on

Members present
Refer to the attached list of attendance

Agenda

- Preliminaries
- The proposed project activities
- The expected benefits of the project
- The anticipated negative impacts of the project
- The proposed mitigation measures
- The Way forward

Min 01/2021 Preliminaries

The meeting started with a word of prayer from a member. The Ass.chief among other leaders welcomed the members to be free to air their views pertaining the proposed project.

Min 02/2021 The proposed project activities

Improved of the water weir, Pipeline works, construction of masonary tanks, farming

Min 03/2021 The expected project benefits.

Increased land under crop production, Improved crop production, improved human health, Employment opportunities, diversified economic activities, Exchange of knowledge, improved nutrition, increased school enrolment, increased income, crop diversification, improved farming technology, Increased literacy level in the area, reduced poverty levels, improved infrastructure and growth of Tamugh Shopping centre were among the listed benefits of the proposed project by the community members and stakeholders present.

Min 04/2021 The anticipated Negative impacts

Despite the positive impacts, the community members enumerated the below negative impacts; Vandalism and damages of pipes, Vegetation loss, soil erosion, contract of communicable diseases eg COVID 19 and STIs, Increased cases of GBV, Accidents,

Min 05/2021 The proposed mitigation measures.

Among the proposed mitigation measures to minimize the extent of the anticipated negative measures are; Adherence to MOH COVID 19 protocols, provision of PPEs at the site, promote terracing, planting of trees along the riparian land, employment of a security guard to guard the pipes and other materials and equipment.

Min 06/2021 The Way forward.

The members present all agreed to the no objection question and proposed the implimentation of the proposed project.

	Name	I.D NO	Phone NO	Sign	Date
Minutes written by:	Cecilia chemoto	24911566	0703553244		
Confirmed by:	Michael Adoywan	30268318	0719858123		Chairperson.
Approval by:	CHRISTOPHER ADOYWAN	8723417	0705389977		

ASSISTANT CHIEF

ASSISTANT CHIEF
TAMUGH SUB-LOCATION.
DATE.....................

ANNEX 4: Minutes and attendance lists for male FGD

Project ESIA minutes for the proposed construction of Kikin irrigation Scheme in Tamugh sub-location Male FGD meeting held at the proposed site on

Members Present

Refer to the attached list of attendance

Agenda

Preliminaries

The proposed benefits of the project

The Negative impacts of the project

The proposed mitigation measures.

Min 01/2021 Preliminaries

The meeting started with a word of prayer from a member

Min 02/2021 The proposed project benefits

Job creation, increased food production, improved nutrition, increased land under crop production, improved school enrolment, Improved literacy level, diversified sources of income as well as increased levels of income were reported to be among the proposed benefits accrued to the proposed project

Min 03/2021 The negative impacts of the project

Soil erosion, Water pollution, COVID 19 and STIs, Cases of accidents at the work place, increased chances of GBV and destruction of vegetation are among the enumerated negative impacts likely to arise from the implimentation of the project.

Min 04/2021 The proposed mitigation measures.

Promote terracing, promote tree planting along the riparian lands, Adherance to COVID 19 protocols, provide PPEs, sensitize the community on Members to address GBV as well as sensitizing the community on modes of transmission of STIs were proposed to mitigate the negative measures.

Min 05/2021 The proposed way forward.

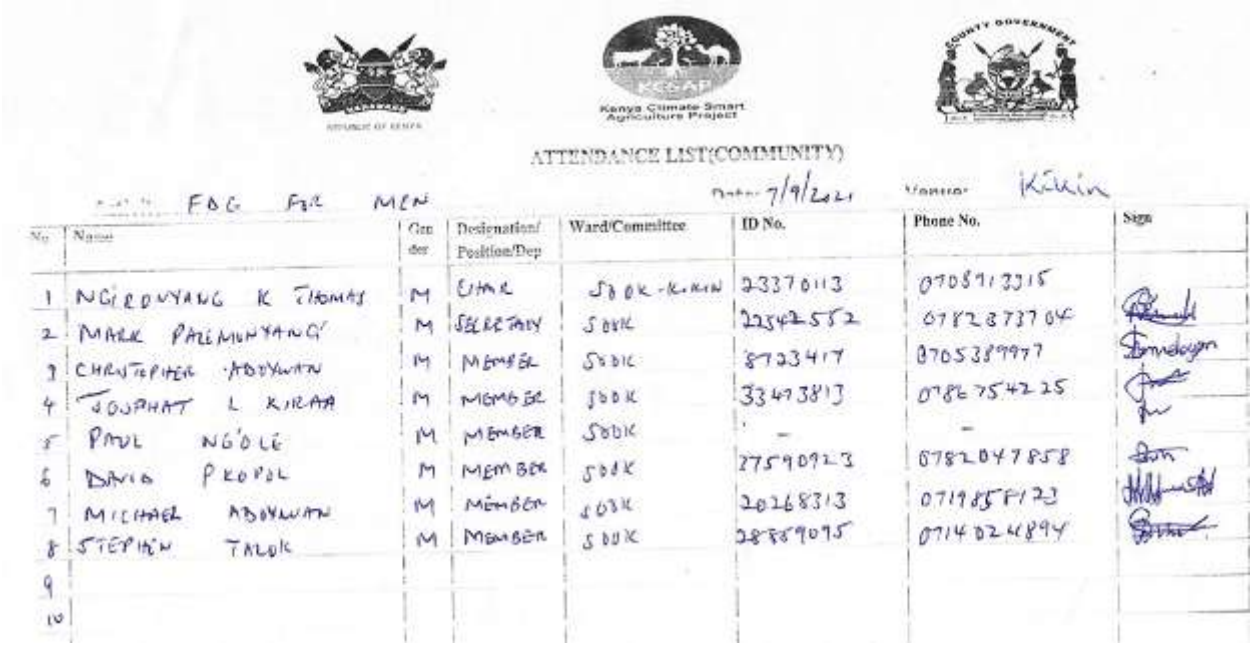
Members present gave a yes to the no objection question and proposed the implementation of the proposed project

Name	I.D No	Phone No	Title	Sign	Date
Minutes written by: Cecilia Chemobo	34911566	0703253244	Secretary		
Confirmed by: Patrick S. Boino	25165908	0708258776	Chairperson		

Approved by: Christopher Adoyoon 0705259977 ASST CHIEF

8723917

ASSISTANT CHIEF
TAMUGH SUB-LOCATION.
DATE.....



Kenya Climate Smart Agriculture Project

ATTENDANCE LIST(COMMUNITY)

FGC FGL MEN Date: 7/9/2021 Venue: Kikin

No.	Name	Gender	Designation/ Position/Dep	Ward/Committee	ID No.	Phone No.	Sign
1	NGIRONYANG K THOMAS	M	CHAIR	SOOK-KIKIN	23370113	0705913315	
2	MARK PARIMUNYANG'	M	SECRETARY	SOOK	22542552	0782837704	
3	CHRISTOPHER ADONYWATN	M	MEMBER	SOOK	8723417	0705389977	
4	JOSPHAT L KIRAA	M	MEMBER	SOOK	33473813	0786754225	
5	PAUL NG'OLE	M	MEMBER	SOOK	-	-	
6	DAVID PKOPOL	M	MEMBER	SOOK	27590923	0782047858	
7	MICHAEL ADONYWATN	M	MEMBER	SOOK	20268313	0719857173	
8	STEPHEN TALOK	M	MEMBER	SOOK	28859095	0714024894	
9							
10							

ANNEX 5: Minutes and attendance list for female FGD

Project ESIA minutes for the proposed construction of Kikin irrigation scheme in Tamugh sub-location
Female FGD meeting held at the proposed site on

Members Present

Refer to the attatched list of attendance

Agenda

Preliminaries

The project benefits

The anticipated negative impacts of the project

The proposed mitigation measures

The Way forward

Min 01/2021 Preliminaries

The meeting started with a word of prayer from a member

Min 02/2021 The expected project benefits.

Increased food production, employment creation, increased land value, increased income at the house hold level, increased school enrolment, food security, increased literacy level, improved hygiene, Ease of acess to water sources.

Min 03/2021 The anticipated negative impacts

Soil erosion, water pollution, Increased cases of house hold conflicts, increased chances of GBV, work related accidents, contact of COVID 19 and STIs were highlited to be anticipated negative impacts of the proposed Irrigation scheme.

Min 04/2021 The proposed mitigation measures.

Provision of PPEs, adherance to COVID 19 protocols (set by MOH, Plant trees along the riparian land as well construction of terraces were among the proposed mitigation measures to combat the anticipated ~~mitigation~~ negative impacts.

Min 05/2021 The Way forward

All the members present agreed to the No objection quation and agreed for the implimentation of the proposed project as the negative impacts are minimal and can be easily contained with adherance to the proposed mitigation measures.

	Name	I.D NO	Phone NO	Title	Sign	Date
Minutes prepared by:	Eulia Chemobo	29911566	0703533244	Secretary		
Confirmed by:	Emmily Chepkoech	25238049	0783363555	Chairperson		
Approved by:	Christopher Adoyo	07-05389977		ASS/CHIEF		

87 23412

ASSISTANT CHIEF
TAMUGH SUB-LOCATION.
DATE.....

Kenya Climate Smart Agriculture Project

ATTENDANCE LIST(COMMUNITY)

FDG FOR WOMEN — Date: 7/9/2021 — Venue: ILIKIN

No.	Name	Gender	Designation/ Position/Dep	Ward/Committee	ID No.	Phone No.	Sign
1	CHEPKAMUI MICHAEL	F	MEMBER	SOIK	25238044	0782383551	
2	DOMILA CHEPOCHEMELOT	F	MEMBER	SOIK	12059785	0751719614	
3	CHEPOCHEWO MOSES	F	MEMBER	SOIK	–	–	
4	DORCUS ELIOS	F	MEMBER	SOIK	–	0785141306	
5	CHEMAUSHO DAVID	F	MEMBER	SOIK	–	–	
6	CHEPTOYE LONGOLOL	F	FARMER	SOIK	–	–	
7	CHEPONYORIO ILGERI	F	MEMBER	SOIK	–	–	
8	SELINA KAMEL	F	MEMBER	SOIK	–	0725529884	

ANNEX 6: minutes and attendance list for youth FGD

Project ESIA minutes for the proposed construction of Kikin irrigation scheme in Tamugh Sub-location FGD meeting for the Youth held at the proposed site on

Members present

Refer to the attached list of attendance.

Agenda

Preliminaries

The project benefits

The expected negative impacts

The Proposed mitigation measures

The way forward

Min 01/2021 Preliminaries

The meeting started with a word of prayer from one of the members. The lead expert took the Youth through the proposed project activities and welcomed them to give their views.

Min 02/2021 The project benefits

Job creation, increased income, increased knowledge on farming activities, diversified economic activities, diversified sources of income, improved nutrition were the expected benefits anticipated by the Youth of Tamugh Sub-location.

Min 03/2021 The expected negative impacts.

The Youth in the area however reported that there would be a negative impacts to the community including introduction of unwanted behaviours, increased spread of STIs and COVID 19, Soil erosion, occurrence of work related accidents as well as loss of vegetation to create land for crop production.

Min 04/2021 The proposed mitigation measures.

Together with the lead expert, associate expert, CESCO and the recorder, the following mitigation measures were arrived at: Provision of PPEs at the site, replacement of trees along the riparian land, terracing as well as mass sensitization of members of the community to combat the extent of the anticipated negative impacts.

Min 05/2021 The Way forward.

Members present all proposed the implementation of the proposed project with adherance to the provided mitigation measures.

	Name	I.D NO.	Phone No	Title	Sign	Date
Minutes Written by:	Cicilia Chemtai	29911562	0725573246	Secretary		
~~Approved by:~~						
Confirmed by:	JOSPHAT LAKIRAN	ID No 33495618	0756742532	Chairperson		
Approved by:	Christopher Ndoroman	0725389877	ASST CHIEF			

ASSISTANT CHIEF
TAMUGH SUB-LOCATION. 23417

DATE.....

Kenya Climate Smart Agriculture Project

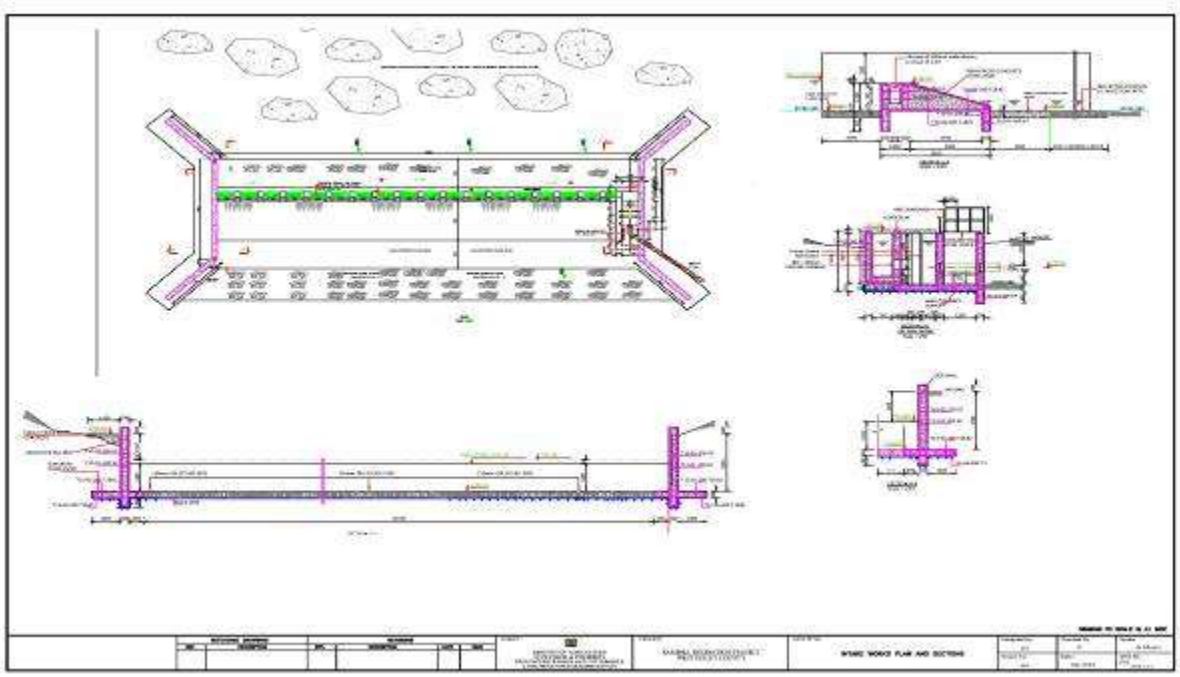
FOG FOR YOUTH

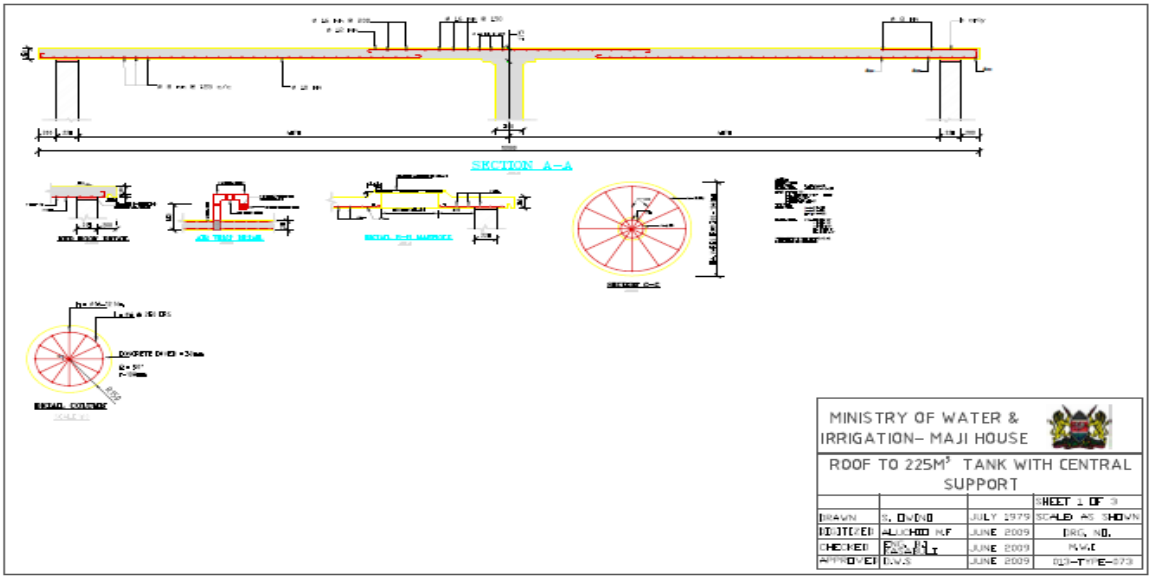
Date: 7/9/2021

	Name	Sex	Designation	Ward/Constituency	ID No.	Phone No.	Sign
1	KACHAPIN MUCA	M	MEMBER	SOOK	35346191	0745513289	
2	WILLIAM ADUNYAN	M	MEMBER	SOOK	21773157	0790031292	
3	DAVID MOIKEL	M	MEMBER	SOOK	23551986	0740867557	
4	JELINA KAPEL	F	MEMBER	SOOK	0735729187		
5	SAMSON [illegible]	M	Member	SOOK	23854408	0758627936	
6	LORENG'AKUDE ASMEDIA	M	MEMBER	SOOK	-	-	
7	CHEPKEMOI MICHAEL	F	MEMBER	SOOK	25238049	0783383555	

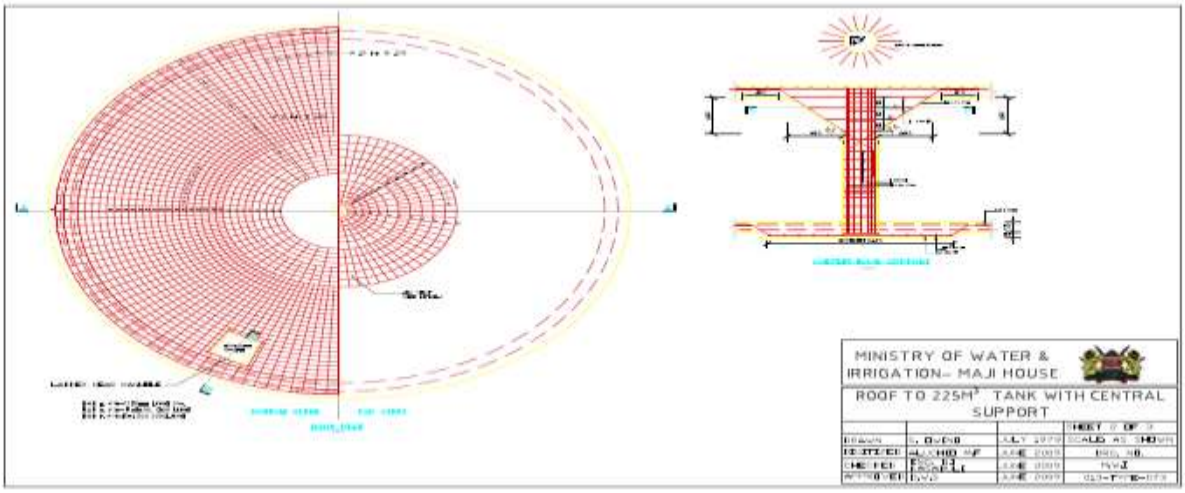
ANNEX 7: designs and drawings & irrigation layout

Intake details

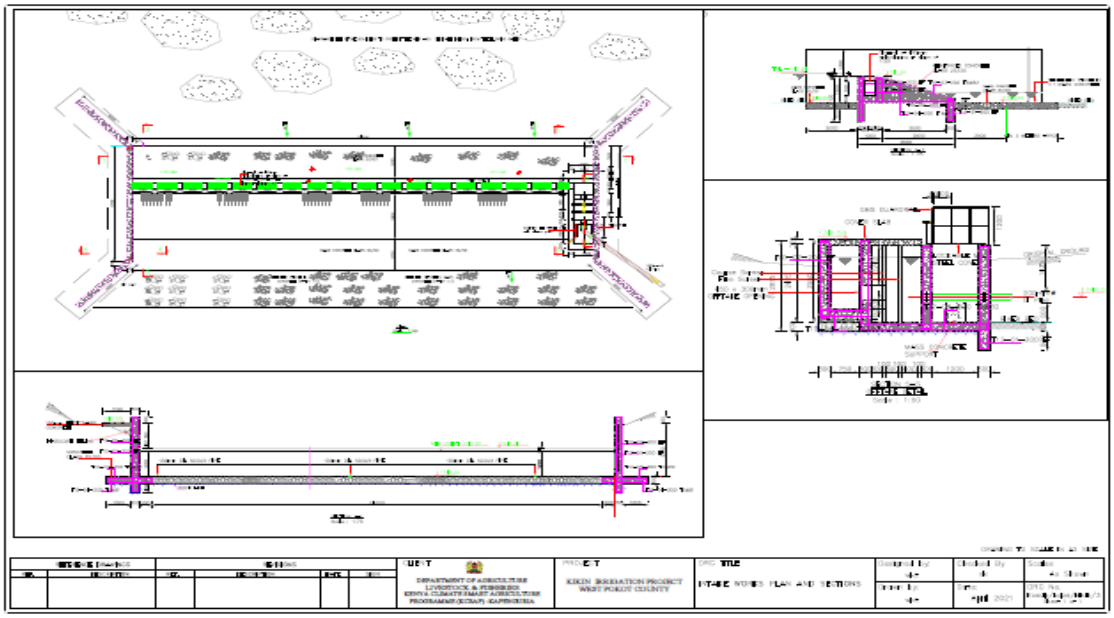




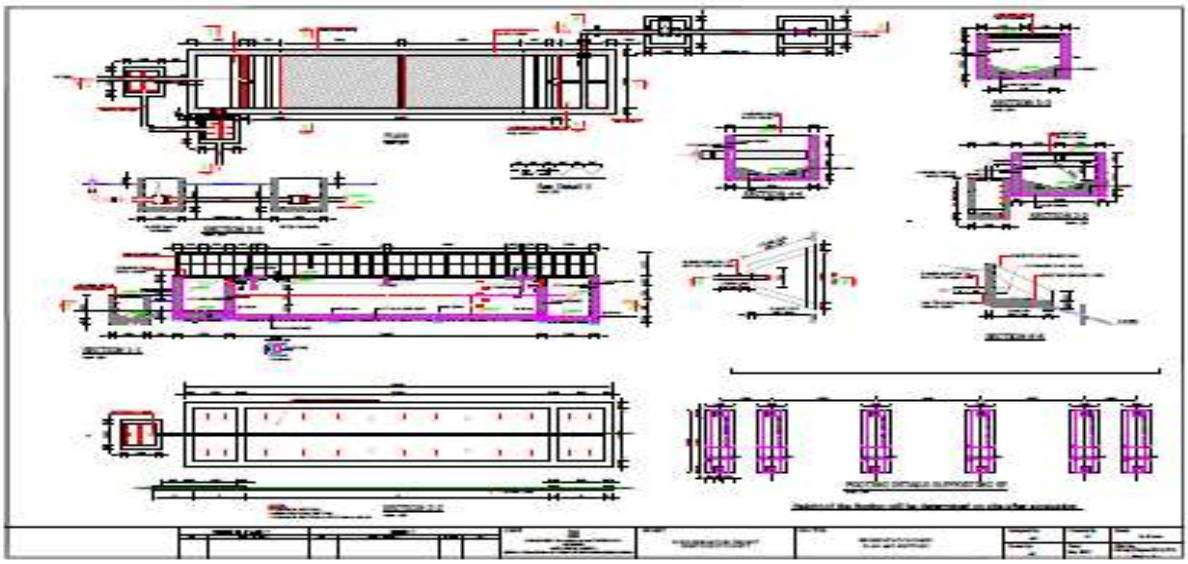
Roof designs of the 225m3 masonry tank



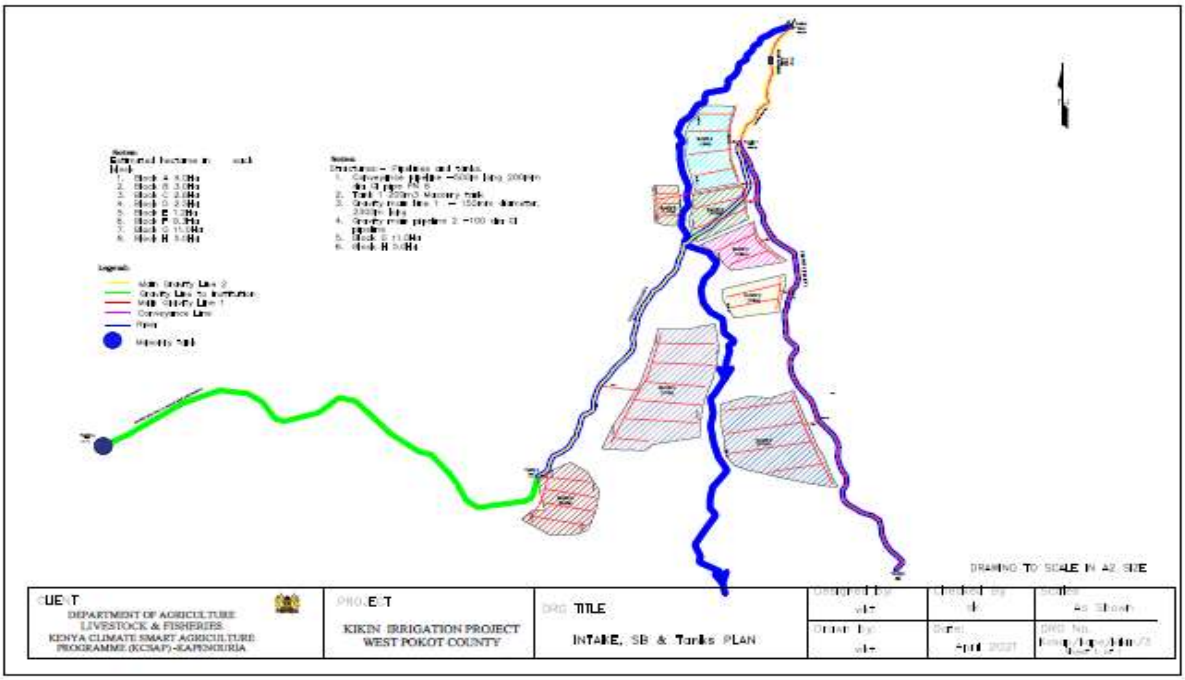
225m3 roof design drawings



Intake weir design drawing.



Sedimentation basin design drawings.



Scheme topo plan of the irrigation scheme

ANNEX 8: bill of quantities summaries

CONSTRUCTION OF KIKIN IRRIGATION PROJECT IN WEST POKOT COUNTY				
BILL NO.	**DESCRIPTION**	**Engineer's Estimated cost**		
1	PRELIMINARY AND GENERAL ITEMS	2,880,000		
2	PIPELINES	24,786,803		
3	INFIELD SYSTEM	234,935		
4	225m3 tank No 1	3,108,220		
5	225m3 tank No 2	2,983,220		
6	225m3 tank No 3	2,983,220		
7	Cattle trough and communal water points	360,000		
8	Intake & Sedimentation Basin	7,066,562		
	Total	44,402,960		
	Contingencies (5%)	2220148		-
	Grand Total	46,623,108		**-**

ANNEX 9: land ownership

REPUBLIC OF KENYA

COUNTY GOVERNMENT OF WEST POKOT.

DEPARTMENT OF LANDS, PHYSICAL PLANNING, HOUSING AND URBAN DEVELOPMENT

When replying please quote
Email: ocs@westpokot.go.ke
Website: www.westpokot.go.ke

OFFICE OF THE COUNTY EXECUTIVE COMMITTEE
P.O BOX 222-30600
KAPENGURIA

9TH SEPTEMBER 2021

KENYA CLIMATE SMART AGRICULTURE PROJECT,
P.O BOX 222-30600.
KAPENGURIA

RE: LAND RESERVATION

This is to bring to your attention that the below listed facilities are situated in West Pokot County. The parcels for the facilities were surveyed and part development plans prepared in accordance with the Physical and Land Use Planning Act 2019.

As you are aware, the community of the areas had unanimously agreed to reserve the land for the purposes for their benefit.

S/no	Name of facility	Purpose	Location	Acreage(Ha)
1.	Kambi Ndege	Water pan/Hay farming	Chesegon	11.22
2.	Kodera	Water pan	Konyao	2.5
3.	Kikin	Water pan & Water Tanks	Tamugh	1.08
4.	Chepsipin	Water pan/hay farming	Alale	8.54
5.	Lomut farmers' cooperative	Cereals cooperative	Lomut centre	0.13

Therefore, the land has been reserved exclusively for the above purposes and there is no change in whatsoever unless public participation views be sorted when need to change the user arise.

Thank you.

COUNTY EXECUTIVE COMMITTEE MEMBER
LANDS, HOUSING & PHYSICAL PLANNING
09 SEP 2021
WEST POKOT COUNTY
P. O. Box 222-30600,KAPENGURIA

AUGUSTINE MONGES
COUNTY EXECUTIVE COMMITTEE MEMBER,
LANDS, PHYSICAL PLANNING, HOUSING AND URBAN DEVELOPMENT
WEST POKOT COUNTY


KIKIN WATER PAN
176450
176350
176250
176150
754550
754650
754700
PROPOSED SITE FOR KIKIN WATER PAN
AREA- 1.0 Ha
CERTIFICATE
I certify that the plan has been prepared and published as per the Physical and Land Use Planning Act 2019
Physical Planner..... MUSA ACHIPA
Signature..... Date.....
AMENDMENTS
COUNTY PHYSICAL PLANNING OFFICER
WEST POKOT COUNTY
13 SEP 2021
P. O. Box 222 - 30600,
KAPENGURIA
MINISTRY OF LANDS AND PHYSICAL PLANNING
PHYSICAL PLANNING DEPARTMENT
PART DEVELOPMENT PLAN
TAMUGEI
DEPT. REF NO. TAMUGEI/757/2021/01
N
SCALE: 1:2500
DATE: 23-08-2021
PREPARED BY: MUSA ACHIPA
DRAWN BY: BENSON INDAKWA
APPROVED BY
HON. CABINET SEC. FOR LANDS AND PHYSICAL PLANNING
NAIROBI
DATE.....
APPROVED DEVELOPMENT PLAN No.

ANNEX 10: field photos








Annex 11: ESIA practising license

ESIA Practicing License

FORM 7 (r.15(2))

nema

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No NEMA/EIA/ERPL/15469

Application Reference No: NEMA/EIA/EL/20485

M/S **Joel Sumukwo**
(individual or firm) of address

P.O Box 400 - 30300 Kapsabet

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **11829**

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

Issued Date: **6/16/2021** Expiry Date: **12/31/2021**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ANNEX 12: hydrogeological report

Client: Kikin Irrigation Project
Registration is WP/SHG/2019/063
P. O Box 175,30600 Kapenguria.

Assignment: Hydrological assessment Report for an Irrigation Project

Report Title:

Hydrological Assessment Report on Ungauged Kikin Stream for irrigation water use by Kikin Community. Intake Coordinates Datum Arc 1960, Projection 37S, 69581.70E, 10131508.30N Meters, LL : 1°11'13.85"N, 35°8'2.89"E ° Elevation 1910 m

Signed: HENRY NJUGUNA HYDROLOGIST LICENCES No. 229 P. O. Box 3776-20100 NAKURU Date: 26 April 2021

Henry M Njuguna
Hydrologist License No 229
PO Box 3776 Nakuru