



**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT
(SUMMARY PROJECT REPORT)
FOR**

**FOR PROPOSED REHABILITATION AND EXPANSION OF ONG'YO (KOGOLA)
WATER PAN ON PLOT L.R NO. SOUTH SAKWA/MIGWENA/633 IN SOUTH
SAKWA WARD, BONDO-SUB COUNTY IN SIAYA COUNTY**

GPS LOCATION: Latitude-0113815, long.34.2159216



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SUBMITTED TO:

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NATIONAL ENVIRONMENTAL AUTHORITY, SIAYA COUNTY**



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DOCUMENT AUTHENTICATION

PROPONENT

I....., hereby confirm that the contents of this ESIA (Summary Project Report) are true to the best of my knowledge and that I shall implement the mitigation measures proposed in this report and undertake to implement further instructions as NEMA may deem appropriate in relation to the findings of this project report and from time to time as inspections may inform.

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Signed by: - Willis Atiang

Date: - 16th December, 2021

ESIA & EA LEAD EXPERT

Fredrick Onyango Aloo ESIA lead expert registered and licensed by the National Environment Management Authority (License No. 9049) and also are members of Environmental Institute of Kenya (**EIK**) confirms that the contents of this report are a true representation of the Summary Project Report study of the proposed rehabilitation and expansion of Ongiyo (Kogola) water pan in Akoko village, South Sakwa ward, Bondo -sub county in The study of the report was done under my supervision and that the assessment criteria, methodology and content reporting conforms to the requirements of the Environmental Management and Coordination Act (EMCA, 1999), Environmental (Impact Assessment and Audit) Regulations.2006.

Signed by the ESIA/EA LEAD EXPERT.9049

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ABBREVIATIONS and ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ASALS	Arid and Semi-Arid Lands
A.S.L	Altitude above sea level
CBD	Convention on Biological Diversity
CDIP	County Development Integrated Plan
COVID 19	Corona Virus Disease
C-ESMP	Construction Environmental and Social Management Plan
EA	Environnemental Audit.
EMCA	Environmental Management Coordination Authority.
EMP	Environmental Management Plan.
ESIA	Environnemental and Social Impact Assessment
ESMMP	Environmental and Social Management & Monitoring Plan
FGD	Focused Group Discussion
GBV	Gender Based Violence
KCSAP	Kenya Climate Smart Agriculture Project
KFS	Kenya Forest Services
KWS	Kenya Wild services
NEAP	National Environmental Action Plan.
NEMA	National Environmental Management Authority.
NPEP	National Poverty Eradication Plan
PAPs	Project Affected Persons (PAPs)
PLWD	People Living with Disabilities
PPE	Personal Protective Equipment
PVC	Polyvinyl chloride
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
OSH	Occupational, Safety and Health
OSHA	Occupational, Safety and Health Act.
ToR	Terms of Reference.
VMGs	Vulnerable Marginalized Groups
WB	World Bank
WHO	World Health Organization

EXECUTIVE SUMMARY

This document is an Environmental and Social Impact Assessment (ESIA) Summary Project Report (SPR) for the proposed rehabilitation and expansion of Kogola water pan in Akoko Village, South Sakwa Ward, Bondo-Sub County, in Siaya County. It is located in GPS coordinates Latitude-0113815, long.34.2159216. The project aims at provision of water for Crop, Livestock production and domestic use and is funded by the Kenya Climate Smart Agriculture Project (KCSAP). A Summary Project report has been prepared for submission to the National Environment Management Authority (NEMA) for review and licensing or for further guidance. Among the legislation reviewed included The Constitution of Kenya, 2010; the Environmental Management and Coordination Act, 1999 (Revised 2015) and its subsidiary legislations; the Irrigation Act, 2016; Public Health (Prevention, Control and Suppression of COVID-19) Rules, 2020; and Sexual Offenses Act, 2006.

The objectives of the SPR were to identify and evaluate the environmental and social impacts and risks, which could arise from the proposed rehabilitation and expansion of the irrigation scheme. This is a World Bank supported project and triggers OP 4.01 (Environmental Assessment), which requires preparation of an Environmental and Social Management and Monitoring Plan

The methodology of the study entailed site visits, public meetings and key informants' interviews. Three different meetings were held at the proposed site On 4st November, 2021. A Total of 80 Members Of Owaka Self Help Group farmers' area residents; and key stakeholders from government departments participated. Among the persons who attended the meeting were Vulnerable and Marginalized Groups (VMGs) especially women, youths and people living with disabilities. Consultations were done and 15 questionnaires were randomly distributed to area residents and selected key government departments for filling. Minutes for these meetings are attached to this report.

Representatives from the various government departments were the South Sakwa Ward Administrator Smart Agriculture Project (KCSAP) County Project Coordinator, County Environment and Social Safeguards officer County Director of Irrigation; County Director of National Environment Authority, Sub County Agricultural Officer.

The issues raised during public participation were on employment, water to reach the targeted beneficiaries, Lack of an organized marketing system and storage facilities to store harvested farm produce. There is inadequate knowledge and skills in irrigation. The members of the Self-help group reported that there is lack of credit to purchase farm inputs hence resulting in lowering farm productivity.

Risks of Contracting COVID-19 is likely to increase and therefore the community will have to be made aware and sensitize. Concerns of engaging persons below the age of 18 resulting into child labour. Both Women and men raised the issue of gender based violence. Cases of Malaria may increase because of mass water body. This will be addressed by provision of mosquito nets by the project management committee

In response to the issues raised the project management committee promised to ensure that water will be available for all the proposed beneficiaries. On marketing it was agreed that the beneficiaries will be linked to a producer organization that will facilitate marketing of farm produce. At the initial phase of the project the beneficiaries will be provided with support on capacity building. The pan will be fenced to protect water from contaminants, water will only be accessed from outside. In order to mitigate the Covid 19 pandemic, there will be strict adherence to health guidelines on the Corona disease by ensuring social distancing of about 1.5 meters, wearing of face masks, hand washing facilities, soap and sanitizers.

Among the benefits anticipated were: employment creation, increase in income from sale of produce from the proposed irrigation and enhanced household food and nutrition security. The following negative environmental impacts were raised in the various meetings; clearing of natural -vegetation by cutting of trees and excavating the sites for pan construction, increased runoff and soil erosion. Noise levels are likely to increase during construction. Pollution through air emissions and dust that emanate from construction activities especially from exhaust pipes for vehicles and machinery used. Negative social impacts raised were on gender based violence, sexual exploitation and harassment, child labor, HIV/AIDs prevalence is likely to increase and risks of contracting Covid 19 at work sites and among community members during consultations.

Mitigation measures to the impacts include encouraging planting of grass and trees along the embankments after excavation. Use machines with less vibrations and encourage workers to wear ear masks to control noise pollution. On Occupational Health and Safety, it was proposed that the proponent provide personal protective equipment such as suitable gloves, footwear, and goggles and head coverings. There will be provision of solid waste collection facilities and sensitization of construction workers on proper disposal of solid wastes. Bathrooms and livestock watering troughs will be constructed to avoid drawing water directly from the pan. Oils and greases emanating from repair and maintenance activities will be collected in containers and reused or taken away by licensed waste handlers to avoid entry into local drainage channels. On Covid 19, the proponent and community members shall ensure adherence to health guidelines provided like wearing of face masks, social distancing, hand washing, and use of sanitizers. Water use conflicts are likely to occur; therefore, community members will be trained on water use.

The project is expected to directly impact on a total of 3000 Community members in both crop production and domestic water use. The overall responsibility for the implementation of the ESMMP lies with the project management committee and the contractor. The ESMMP will be implemented at a cost of Kshs1, 460,000 The community noted that project will go a long way in solving their chronic food insecurity that have haunted them for years. They however requested cooperation between the proponent and their leaders so as to ensure smooth implementation. The entire project is estimated at a cost of approximately Kshs **66,000,000**.

Recommendations

It is recommended that a copy of the environmental and social management plan be given to the contractor prior to construction. The contractor needs to demonstrate how the ESMMP will be

implemented in the construction process and the proponent must implement ESMMP during operation phase

Conclusion

The positive environmental impacts surpass the few and minor negative impacts that have been identified. The negative environmental impacts have been detailed in environmental social management plan, which will be executed during the project implementation and operation phases to safeguard the environmental interests. In view of the anticipated benefits, the community members were in agreement with implementation of the project and are eagerly waiting for it to commence.

CHAPTER ONE: INTRODUCTION

1.0 Introduction

The proposed Rehabilitation of Ong'uyo/Kagola Water Pan for Food Security and Environmental Conservation project is one of the community driven initiatives to adapt to climate change within Siaya County. This project is amongst the Sub projects being fronted by Siaya County for funding by The World Bank under Kenya Climate Smart Agriculture Project (KCSAP) for which Siaya County and 23 more counties are the beneficiaries in Kenya following an intergovernmental participation agreement with the national Government. Once rehabilitated the pan intends to directly benefit over 3000 community members with anticipated number of female beneficiaries being 2000 and that of male being 1000. In addition, there will be benefit from crop production through irrigated farming and livestock production through availability of water and fodder throughout the year.

The existence of Ong'uyo/Kagola water pan dates back to 1960's when it was first put up by the colonial government to caution local residents against water scarcity in the area, it sits in sections of an open 5.5 ha public land title No South Sakwa/Migwena/633 Sheet No 6 (Attached Annex I) . By then the community used walk at a distance of about 8km in search of water. Locally the pan is commonly referred to as KOGOLA water-pan.

Since the year 2000, the pan has severally broken its bank and draining off water. Effort to restore the water pan through community actions, Constituency Development Fund (CDF) and Siaya County Development funds has borne little success.

1.1 Justification

The Kogola water pan hardly retains water that can sustain the community domestic and livestock need all year round. The targeted beneficiaries of the pan have suffered from inadequate clean and safe water for both human and livestock use and crop production. In addition, land productivity in adjacent area has been compromised and degraded to erosion by the runoff that otherwise would be harvested and stored in the pan for community use. This has caused poor harvest hence food insecurity, compounded with water shortage and water borne diseases. The banks are unprotected and accessible by animals from all corners, there are no specialized cattle drinking traps and area prone to open defecation that might contaminate the waters. Hence the need for rehabilitation and expansion of the water pan

1.1.1 Objective of ESIA

The aim of this environmental and social impact assessment was to identify significant potential impacts of the proposed project to environment, social, economic and health aspects and formulate recommendations to ensure that the project takes into consideration appropriate measures to mitigate any likely adverse impacts to the environment and people's health livelihood through all phases of its construction and implementation.

The specific objectives include to: -

- Evaluate social-economic conditions and human health. This would include but not limited to issues such as archeology, cultural heritage, landscape aspects, recreational, social, economic aspects, land ownership, land use, infrastructure, agricultural development, and human health.
- Prepare Environmental Management Plan for the three stages of the project which will also be used for subsequent yearly audits
- Prepare an ESIA (SPR) report in accordance with the environmental legislation guidelines and submit to NEMA for further instructions and / or approval.

1.2 Study Methodology

1.2.1 Primary data

Primary data was collected using the following methods:

- Direct field observation through site walks, to identify land uses, topography, soil types the state of environment and other key environmental issues
- Administration of questionnaire (15 questionnaires were administered and filled). A sample filled-in questionnaire is attached in Annex IV.
- Focused Group discussion with members of the community and Owaka Self Help Group on the proposed project and general life
- General interviews with key informants from the various sectors, the provincial administration (chiefs, ward administrators, village elders) and institutions near proposed site of the project
- Discussion with field officers and their experiences in the proposed area as this is their working area; Among the officers were from, County Environment Officers, Department of Agriculture, Department of livestock, National Museums of Kenya (NMS), Governor office/ Ward office, Water Department, Department of Irrigation, Fisheries Department Chief- Akoko location.

1.2.2 Secondary data

Detailed desktop study was conducted on reports from all the specialized sectors integrated with the project. The information was obtained from the following partners: Department of Social services, Department of Public Health, Departments of Agriculture and Irrigation Livestock, County NEMA office also provided the needed information coupled with the County Government who provided the detailed County Integrated Development Plan (**CIDP**). Also had a meeting with the client (proponent) the County Project Coordinator (**CPC**) to obtain more and relevant literature on the project operation in the county. The ESIA field studies, desk data collection, community participatory meeting and analysis were undertaken from 2nd November 2021 to 5th November, 2021. The purpose was to generally evaluate the types, mode of action, dynamics and magnitude of the specific projected effects and impacts, both favorable and detrimental to the environment and natural resources at the project site

1.3 Structure of the report

The report structure is organized in 9 chapters. Chapter 1 covers the general introduction of the project and its relation to the KCSAP project. In chapter 2, a description of the nature of the project is given covering what the project entails. Chapter 3 describes the location of the project and its surrounding. Public participation and stakeholder engagement description and methods used to reach them is described in chapter 4. A description of potential impacts and mitigation measures foreseen in the project is provided in chapter 5. Chapter 6 gives a table that describes the Environmental and Social Management & Monitoring Plan (ESM&MP) that will be implemented by the project. Chapter 7 sums up the conclusion and recommendations for the whole assessment. References and Annexes are given in chapter 8 and 9 respectively

CHAPTER TWO: NATURE OF THE PROJECT

2.0 Introduction

This chapter gives details of the project design. It highlights the project design and materials supported by design and plan drawn to scale and signed by an engineer. Additionally, it provides an overview of project activities during construction, operation and decommissioning phases. Included is a proof of land ownership and a description of any existing environmentally sensitive areas and description of the project area

2.1 Overview

The County government of Siaya has prioritized interventions in agriculture to improve crop and livestock production since agriculture is the mainstay of the county's residents. Increasing the area under irrigated land in the county will ensure a secure production of staple as well as high value crops that increase the farmers' income.

During construction phase there will be minimal clearing of vegetation, excavation, fencing, installation of solar powered pump and accessor, establishment of community water points, construction of bathrooms for men and women. Establishment of tree nurseries and the pan will be stocked with fish for fish farming. The pan is sitting on a public land as per land search document in Annex II. Water supply to the farm will be through gravity flow through infield pipelines which will in turn discharge water through riser pipes into distribution chambers and off takes.

2.2 Design Concept and Material

The siting, design concept and criteria for were developed in accordance with the general guidelines and standards used in the design of structures/pans in Kenya and are in line with international standards for best practice by the County Government of Siaya, through the Kenya Climate Smart Agriculture Project (KCSAP). An approved project design has been attached to this report (Appendix iv).

2.2.1 Design

Topography of the pan

The project area is within a valley surrounded by relative raised undulating terrain. It is the main drainage way of all the flood waters and runoffs within the area. The average slope of the site is 1.9%

Soils

The soil is predominantly black cotton soil. Soil test pits should be dug using augur randomly at the bed to test top and subsoil layers. This soil type should be able to hold water sufficiently.

Hydrology

The sources of water in the project area are adjacent seasonal stream and surface runoff. The catchment is vast and covered with shrubs and some trees and was approximated to be 1.2km². most of the adjacent farms are under cultivation

2.3 Pans Catchment Area

The water catchment of the water pan spans over 9 Kms² covering the following areas: Nyamira Junction, Nyahera, Yao Miruka and Migwenga.

2.3.1 Design Calculations

Water Demand Areas

Based on the water needs of community, Water demand has been classified into the following categories

- Household/ domestic water demand,
- Institutional water demand
- Crop water demand
- Livestock Water demand
- Commercial and Cultural water demand.

2.3.2 Population Projections

The following relationship will be used for population projection.

$$P_n = P_p (1 + r)^n$$

Where P_n = Population at n years
 P_p = Present Population
 r = Population growth rate
 n = Number of years.

The population figures used in calculating the water demand are based Kenya Population and Housing Census 2019. As per 2019 population census, the growth rate for Bondo Sub-County was 2.6% per annum. Therefore, the 2.6% rate will be used in projecting the population.

Number of households = 1130

Average number of persons per household =4

Total number of persons = 4520

School going children (42%) = 1898

Adults 58% = 2622

Percentage of Households with Livestock = 43%
 =486 H/Holds

Average number of cattle +donkeys per household = 3

Total number of cattle + donkeys = 1458

Average number of shoats per household = 4

Total number of shoats =**1944**

Present period – year 2021

Initial period – year 2025

Future period – year 2035

Ultimate period – year 2045

2.3.3 Human Projection

Table 1 Human population

	2019	Present 2021	Initial 2025	Future 2035	Ultimate 2045
Primary school Pupils	1898	1947	2454	3092	3895
Adults	2622	2690	3390	4271	5381

2.3.4 Livestock Projection

Table 2 Livestock Population

Type	2019	Present 2021	Initial 2025	Future 2035	Ultimate 2045
Cattle and donkeys	1458	1496	1885	2375	2992
goats /sheep	1944	1995	2513	3167	3990

2.2.5 Water Demand Analysis

Table 3: Water Demand m³/day

Category	Rate	2019	Present 2021	Initial 2025	Future 2035	Ultimate 2045
Primary School	5L/h/day	9.49	9.74	12.27	15.46	19.48
People	15L/h/day	39.33	40.35	50.84	64.06	80.72
Cattle	20L/h/day	29.16	29.92	37.7	47.50	59.85
Shoats	5L/h/day	9.73	9.97	12.57	15.8	19.95
Total						180

With ultimate water demand of 180m³/day this translates to 180m³/day *30days*5months=27,000m³ for the dry period.

- Evaporation of the area is 5mm/day and the longest dry period experienced has been for 5months information obtained from locals, this totals to a loss of 5mm/day*5months*30days = 750mm using surface area of the pan at full water level is 6750m² * 0.75m= **5062m³** as evaporation loss
- Dead storage is not very significant in water pans but take 10% of pan capacity i.e., 2700m³

Hence total water demand is 34762m³. There is need to design for 35,000m³.

2.3.6 Runoff Estimation

According to manual for water pan construction Ministry of Water and Irrigation the catchment area for water pans of up to 20,000m³ peaks at 0.20km² but the catchment for this site has approximate area of 1.2km² from Google earth. After calculations and analysis runoff peak runoff is given by;

$$Q = \frac{0.5 \times 40.7 \times 1.2}{3.6} = 6.78 \text{ m}^3/\text{s}$$

2.3.7 Sediment Yield

Table 3. Indicative sediment yield from Kenya Belgium Water Development Programme guidelines manual for small dams in Kenya

Table 3 Indicative Sediment yield

Erosion rate	Sediment yield (m ³ /km ² /yr)
Low	500
Moderate	1000
Heavy	1500

The catchment area terrain is fairly covered with vegetation thus a low sediment yield of 500m³ per km per year may be taken

Given the catchment area = 1.1 km²

Sediment yield = $1.2\text{km}^2 \times 500$ (Due to gentle slopes in the area, soils available,
and vegetation type)
= $600 \text{ m}^3/\text{year}$

Assuming 75% of this sediment is trapped
Volume of silt trap (volume of silt trap) = $0.75 \times 600\text{m}^3$
= **$450\text{m}^3/\text{year}$**

CHAPTER THREE: LOCATION OF THE PROJECT

3.0 Introduction

This section describes the project area's physical, biological and socio-economic environments. The project needs to put into consideration various environmental aspects as it shall make utility of environmental resources.

The proposed project is primarily rehabilitation, expansion and modernization of existing silted and debilitated auxiliary facilities at existing Kogola water pan in Siaya County. Siaya County is one of the six counties in Nyanza region. It has a land surface area of approximately 2,530 km² and water surface area of approximately 1,005 km². It borders Busia County to the North West, Vihiga and Kakamega counties to the North East, Kisumu County to the South East and Homa Bay County across the Winam Gulf to the South. The water surface area forms part of Lake Victoria (the third largest fresh water lake in the world). The proposed site falls in the lower catchment of the area in a valley.

3.1 Location and size

The proposed site is in Akoko Village, West Migwena Sub Location, South Sakwa Ward, Bondo Sub County in Siaya County. The site lies within Latitude-0113815, long.34.2159216. The pan is strategically located along Bondo Liunda road the site is approximately 50 metres from the road. The project when fully operational will serve six villages namely; Akoko, Yenga, Magak, Gombe, Mitiro and Alara Villages in South Sakwa Ward other beneficiaries extend to some parts of Central Sakwa Ward. The project location is presented Plate 2.1.



Figure 1 Map indicating the site of proposed Kogola water pan of google earth

3.2 Soils

To determine the soil texture, a transect walk was undertaken in and around the proposed irrigation facility. It was noted that the soil texture is uniform in the said area and the soil profile was indicative of moderately calcareous soils. To determine the soil texture further below depth texture, a trial pit was dug to a depth of 1.2m deep. The soils are well drained moderately deep to deep, dark reddish brown to dark red friable to firm, sandy clay to clay in many places with stonelines (chromic VERTISOLS).

The soils are suitable for quite a wide range of horticultural crops and mainly vegetables such as tomatoes, kales, onions, chilies, capsicums, French beans, water melons, sweet melons. It is also suitable for cereal crops including maize, green grains and peas.

3.3 Ecological and Climatic Conditions

The proposed project site is in Agro climatic Zone III -3 and is within an altitude of about 1200m above sea level. Rainfall is bimodal; with long rains expected in the months of April to May while the short rains are received in the months of October to November. Rainfall expected per year ranges between 800mm and 1400mm. Temperatures are high all year round ranging from 22° and 24°. The zone is mainly used for agriculture and livestock rearing.

3.4 Vegetation Conditions

The pan area is well inhabited and there is a diversity of tree species with agro-climatic zonation dictating the distribution of both exotic and indigenous tree species. This include shrubs, grasslands, herbs.. Some of the most common trees in the proposed site include *Acacia drepanolobium*, *Balanitis aegyptiaca*, *Markhamia lutea*, *Albisia corarria*, *Ficus sycomora*.. Project implementation will take this into consideration in their planning of catchment conservation interventions. The economic importance of trees is on soil conservation, provision of firewood and timber

3.5 Demographic attributes

As per 2019 population census, the growth rate for Bondo Sub-County was 2.6% per annum. Therefore, the 2.6% rate will be used in projecting the population.

Number of households in the proposed project area is = 1130

Average number of persons per household =4

Total number of persons = 4520

School going children (42%) = 1898

Adults 58% = 2622

3.6 Infrastructural access

The area particularly is accessible through Bondo Liunda murram road. The Location has electricity supply and is connected to the national grid. However, the main source of energy for cooking is fire wood. There is low utilization of other sources of energy like solar and wind. Telecommunication network is good. Housing and shelter largely semi-permanent houses which are iron roofed. A high proportion of people live in semi-permanent houses that seldom have access to essential basic services and infrastructure thereby leading to insecure and unsafe living conditions. The most or notable infrastructure included a Akoko primary school, Akoko Secondary School, Gombe dispensary at Akoko about 200m from Akoko Village, The area has 3 secondary universities and 5 primary schools

3.7 Land Ownership

The land for the proposed Kogola water pan in South Sakwa is under the defunct county council of Siaya and currently under the trustee of County Government of Siaya. It is a public land title

No. South Sakwa/Migwena/633 Sheet No 6 (Attached Annex I) The site is a pre-existing site set aside for water pan construction and has the blessing of the county administration.

3.7.1 Crop production

Among the crops cultivated include food crops (green grams, maize, Kunde, kales, water melon) and horticultural crops such as kales and tomatoes. The community relies on rainfed agriculture which has led to low crop production due to frequent rainfall failures. On marketing, most of the produce is sold locally in the nearby town of Bondo

3.7.2 Climate change effects

The evidence of climate change in the locality and the entire County has been observed in terms of increase in variability of erratic rainfall.

Climate change mitigation strategies which aim at reducing the emission of greenhouse gases (GHGs) from human induced activities need to be put in place. The strategies include: Solar energy, increase in ground cover by planting food crops, quality palatable pastures and fodder that will enhance carbon sinks and also provide high quality animal feeds.

3.8 Conflict and Grievance Resolution Mechanism (GRM)

The main grievances were those involving succession and inheritance, natural resources, grabbing of public utility spaces and land boundary disputes, tenancy and labour. Domestic violence relating to sexual exploitation and abuse and gender-based violence are some the cases relevant to project implementation. Several methods are used in resolving these household conflicts as reported during the survey.

The instruments used in the resolution of the reported conflicts in the area include.

- ✓ Extended family members
- ✓ Religious institutions/ religious leaders
- ✓ Chief/Assistant chief
- ✓ Elders
- ✓ Courts

Even though men make decisions in the whole process of development, all the genders including men, women and youth implement the activities. The positive side in the project area is that the Nyumba Kumi head and village elder has been bestowed on female gender to signal that gender roles will not limit community responsiveness and implementation. As this project is guided by the Social Accountability and Integrity Committee principles, the PMC has been tasked with forming an Accountability subcommittee to provide leadership in the GMR process. The sensitisation of the community on GMR framework has been undertaken on 1st November, 2021. Though no record of conflict of communal water resource use is recorded, the likelihood of GBV or SEA during construction and operation phase of the project have been raised and the ESMP has captured detailed precautionary measures to address the social risks.

CHAPTER FOUR: PUBLIC PARTICIPATION AND STAKEHOLDER'S CONSULTATION

4.0 Introduction

The following section describes the consultations and public participation held to assess the opinions and attitude of the various stakeholders on the expansion and rehabilitation of the proposed water pan project. A participatory approach was adopted as an ongoing strategy throughout the entire project cycle. Public participation and consultations were done through individuals, groups and community meetings.

4.1 Objectives of the Public Consultations/meetings

The overall goal of the consultation process is to disseminate project information and to incorporate the views of the Project Affected Persons (PAPs) in the design of the mitigation measures and the management plan.

The specific aims of the consultation process were to: -

Improve project design and, thereby, minimize conflicts and delays in implementation;

- Facilitate the development of appropriate and acceptable entitlement options; Increase long term project sustainability and ownership.
- Reduce problems of institutional coordination.
- An important element in the process of impact assessment is consulting with stakeholders/community to gather the information needed to complete the assessment.

, and potential impact on project outcome that is the irrigation scheme project construction.

4.2 Participation Consultation/Interviews

The participant consultations were done on two levels: community participatory meeting at the project site done at two levels that is Focused Group discussions (FGDs) and individual interviews on persons sampled among men, women and youth among the participants. Individual interviews done on prepared questionnaires to capture individual perception on the project (*Sample questionnaire attached as annex 6*)

There was public meetings and key informants' discussions. Three different meetings were held at the proposed site on 4th November, 2021. A total number of 80 members of Owaka Self Help Group, area residents; and key stakeholders from government departments participated. Among the persons who attended the meeting were Vulnerable and Marginalized Groups (VMGs) especially women, youths and people living with disabilities. Consultations were done with key stakeholders and 15 questionnaires were randomly distributed to area residents and selected key government departments for filling. Minutes for these meetings are attached to this report.

During some of the visits a field tour of the general area was undertaken and a detailed examination of the ecological setting of the area was carried out. Types of existing plant species and wild animals were recorded. The environmental condition existing in the proposed project area were documented to provide baseline data. The possible impacts of the proposed project activities were thereafter assessed against the documented baseline data. Section 35-2 of the environmental Impact Assessment and Audit Regulations 2003, requires that an EA should: *“examine and seek views on environment, health and safety issues from the local community and other potentially affected communities”*

Below is a plate of key participants filling individual questionnaire forms for analysis



Plate 1: Lead expert consulting with community members of Akoko Village as they fill the individual questionnaire



Plate 2: Lead Expert undertaking community meeting with some of the community members



Plate 3 Lead expert visiting the proposed site

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

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

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

The sub section below summarizes issues that were raised and captured in the questionnaires from the community (respondents) towards the proposed water pan project and issues captured during the desktop studies analysis. The issues have been categorized as positive and negative issues (Selected Sampled filled questionnaires attached as annex 6)

4.2.2 Key issues arising from public participation meetings

Consultative meetings (baraza) with community in conjunction with the proponent and the administration. The list of attendants is presented in Appendix 1. The agenda of the meeting was to inform the community about the project and receive comments and suggestion from participants

The following is a summary of issues raised by members who attended the meetings

4.2.3 Perceived Benefits

- a) **Economic and social benefits** to the communities and contribute to the attainment of the National priority goals and ongoing National efforts to accelerate economic growth and alleviate poverty under the Food and Nutrition Security under Agenda 4
- b) **Enhanced food security and improved nutrition at the household level.** This will alleviate impact of erratic and unreliable rainfall pattern on the community's productive resources. Continuous supply and availability of food throughout the year.
- c) **Employment opportunities** will be offered to the construction workers and any other person who will be hired to provide her/his services during construction phase. In addition to direct employment, supplies of basic necessities to the workers will also lead to more employment opportunities and acquisition of entrepreneurial skills. This will engrain a sense of project ownership within the community
- d) **Reduction of idleness** amongst the youth due to an increase in income generating activities either directly or indirectly
- e) Incidences of abuse of drugs due to idleness will decline
- f) The project would ensure that greenhouse gas emission is reduced by using solar power to pump water to draw water from the pan
- g) Trees would also be planted in the project areas to act as carbon sink hence mitigating greenhouse gas effects to the environment
- h) Promote nutritional balance through integration of traditional high value crops such as amaranths vegetables and the yellow fleshed sweet potatoes that are highly rich in vitamin A hence reduced levels of malnutrition levels in the project area.
- i) **Using solar powered submersible pumps would curb greenhouse gas emission.**
- j) The **maize stalks that would be left after harvesting** would be used as livestock feeds hence improve on livestock production.

4.2.4 Issues of concern

- a. The community expressed concern on **water distribution and rationalization** which does not reach the targeted community. The project management will put in place mechanism to enable all community members to access water in compliance with their own established bylaws
- b. **Lack of marketing strategy infrastructure for product;** currently farmers do not have a crop storage and marketing plan. There is need to link the farmers to producer organizations that will assist in providing a marketing plan and strategy
- c. **Lack of adequate knowledge and skills in irrigation.** This could be attributed to limited knowledge and lack of irrigation crop production skills, tillage services, fertilizer, seed, integrated pest management and operations of irrigation equipment and management
- d. **Poor road infrastructure** that would hinder supply of farm produce to the Bondo liunda murram road . The county government can open up the murram road so that it can be made accessible and all weather
- e. Clearing of vegetation during construction phase, this would be addressed through reforestation programs and sparing of indigenous trees during the expansion and clearing process
- f. **Lack of credit especially for irrigation purposes** to enable growing of high value crops and source inputs on time, and at competitive rates may hamper scheme productivity and adoption of climate smart agriculture techniques. The project beneficiaries through collective action can enhance access to financial service providers
- g. **Accidents during Construction:** There is likelihood that during the construction phase of the proposed project, construction workers may get involved in accidents as a result of falling building stones/bricks, sharp metals and machines used in the construction. The

proponent will strictly adhere to safe working practices to protect the workers, neighbors and passers-by

- h. **Noise pollution:** There was concern over the possibility of high noise and vibration levels in the project site as a result of excavation and construction works. The sources of noise pollution will include transport vehicles, construction machinery and metal grilling and cutting equipment
- i. **Risks of Contracting COVID-19** is likely to increase and therefore the community will have to be made aware and sensitized accordingly.
- j. **Concerns of engaging persons below the age of 18** was raised especially the issue of family labour in the irrigation plots. That child labour should be discouraged as much as possible
- k. Both Women and men raised the issue of **gender-based violence** especially in view of COVID -19. It was agreed that the project will keep households busy and hence lower incidences of violence in homes.
- l. Cases of Malaria may increase because of stagnant water in the irrigated fields. This will be addressed by provision of mosquito nets by the project management committee

Community members raising their hands in acceptance of the project



Plate 4: Participants raising hands in acceptance of the project

CHAPTER FIVE : ANTICIPATED IMPACTS AND PROPOSED MITIGATION MEASURES

5.0 Introduction

This chapter presents the assessment of issues likely to arise as a result of the rehabilitation and expansion of the Kogola water pan project. The anticipated impacts are discussed in three phases namely construction, operational and decommissioning phases.

5.1 Impacts during Construction phase

Construction phase shall begin with excavation in an area of about 14 acres. Construction impacts have the potential to create nuisance to adjacent neighbors but these could be managed to acceptable limits. In addition, the construction impacts are also temporary in nature

5.1.1 Anticipated Positive impacts during Construction phase

a) Employment opportunity

The construction phase of the pan project will be characterized by recruitment of both skilled and unskilled laborers to work with contractor. The rise in population will create corresponding increase in demand for goods and services such as food for construction, workers, housing, health care and need for transport. These needs will be satisfied by people living within the project area where local women will provide food vending services, homes will rent out spaces for new population and shops will also benefit from increase of sales.

b) Provision of Market for Supply of Building Materials

The construction work will require supply of large quantities of building materials such as cement, timber, steel, among others most of which will be sourced locally.

5.1.2 Anticipated Negative Environmental Impacts during Construction phase

a) Vegetation Loss

Clearing of vegetation including grass, shrubs and trees is likely to occur during the laying of water conveyance and other development that involve excavation. This will be done along the riparian area and within the farms.

Mitigation measures

- Proper demarcation of construction areas to minimize trees to be felled
- Promote agroforestry during the operation phase to replace and enhance vegetation cover in the project area
- The contractor should ensure that vegetation is cleared only where necessary and if in the process mature trees are cut, new trees should be planted in areas adjacent to the cleared ones

b) Increased soil erosion

Excavation of soil and removing as well as are major activities during the construction phase of the project. They are bound to result in significant amounts of loose of residual soil, prone to erosion through surface water runoff, especially during rainy season

Mitigation measures

- Minimize exposed areas by properly demarcating the project area to be affected by the
- The contractor must put in place silt trap to avoid erosion in areas that are prone to erosion

-
- All excavation works must be properly backfilled and compacted along the embankments

c) Air quality and dust emission

Principal dust sources during construction will be generated during excavation works and possibly from project burrow pits, also during haulage of construction materials over distances. Gases from construction equipment and vehicles will also be emitted. The dust may cause respiratory complications to workers and nearby residents. Fumes and carbon compounds from the equipment and machines inhibit visibility and form deadly compounds in the air.

Mitigation measures

- Any stockpiles of earth (excavated), though little, should be enclosed or covered and watered during dry or windy conditions to reduce dust emissions
- Masks should be provided to all personnel in dust generation areas throughout the period of construction
- All equipment on site should be properly maintained in good operating condition so as to emit minimal air pollution
- Emission of gases from fuel combustions by machines can be reduced by use of e.g. exhaust systems that are in good working condition. This will significantly help in reducing the noise levels and the amount of destructive gases to atmosphere.
- Vehicles delivering soil materials should be covered to prevent dust emission

d) Noise and vibration

The construction works delivery of building materials by heavy trucks, blasting and use of machinery/equipment including bulldozers, generators, metal grinders and concrete mixers will contribute to high levels of noise and vibration within the construction site and the surrounding area. Such noise within the site can cause nuisance and disturbance to the project workers and the residents, passers-by and other persons in within the vicinity of project site

Mitigation measures

- People participating in the construction should be provided with Personal Protective Equipment (PPE) such as ear muffs for ear protection
- Sound-attenuated equipment should be used as much as possible
- No unnecessary hooting by project and resident vehicles
- Noise levels should be kept within acceptable limits preferably as stipulated within the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) Control Regulations 2009:
- Limit pickup trucks and other small equipment to an idling time, observe a common sense approach to vehicle use and encourage workers to shut off vehicle engines whenever possible;

e) Increased Solid waste generation

Large quantities of solid waste will be generated at the site during construction works. Such waste will consist cement, and gravel packs and other packets of materials and equipment metal cuttings, rejected materials, surplus materials, surplus spoil, and excavated materials, paper bags, empty cartons, empty paint and solvent containers, broken glass among others.

Mitigation Measures

- The excavated material shall be recycled

-
- Minimize waste generated by adopting cleaner production methods e.g. conserving raw materials, enabling the recovery and reuse of waste product where possible
 - Use durable long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time
 - Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements of nature i.e. sunshine among others
 - Containers or package for storing hazardous waste including used oil to be safely bundled and labelled as provided for by Regulation 18 under the Environmental Management Coordination (Waste Management) Regulations 2006 and the Public Health Act

f) Oil spills

The machines on site and vehicles contain moving parts which require continuous oiling to minimize the usual corrosion or wear and tear. Possibilities of such oils spilling and contaminating the soil and water on the site are possible. The potential for water contamination is likely and the effects are injurious to the aquatic life patterns and making drinking water unsafe for human consumption and domestic livestock

Mitigation Measures

- Vehicle maintenance should be done on purpose-built impervious concrete platforms with oil and grease traps
- Standard operating practices for re-fueling mobile equipment such as a minimum 15m from any water channel should be practiced
- All above surface tanks should be bounded and mounted on paved surfaces
- Ensure that all equipment is in good condition, clean and free from leaks
- Oil spill containment and clean up equipment should be safely kept by contractor

g) Safety Health and Environmental (SHE) Concerns

Every construction tool equipment and machines shall be well set adequately maintained. As well the construction area shall be kept free from objects such as sharps and tripping, which can cause emergencies and occurrences of accidents ranging from minor cuts to fatalities during construction

Recommended mitigation Measures

- The construction site shall be adequately protected or fenced off from unauthorized intrusions and warning signs, barricades should be properly displayed and strictly adhered to.
- Provision of safe working area with adequate and well-equipped First Aid should always be maintained on site at all times during the whole period of construction
- In addition to the proponent should ensure that the contractor adheres to rules set by authorities for protection of his workmen such provisions of insurance and protective gear
- Adequately washing facilities should be provided for workers' hygiene and protection
- Engage contractors who are fully conversant with occupational health and safety matters at workplace. As regards compliance by the contractor, the proponent on his part should

ensure that all mitigation measures are strictly enforced through his site representative and his assurance should be firmly embodied in a signed contract document.

Information and education on operation and management of the facility, including all the environmental aspects should be offered to all the concerned for purposes of project responsibility, sustainability in terms of water quality and yields as well as safety

5.1.3 Anticipated Negative Social and health Impacts during Construction phase

a) Gender based violence and sexual harassment (GBV/SH)

This impact is triggered during project construction phase when the contractor(s) fail to comply with the following provisions:

- ✓ 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:

- Ensure clear human resources policy against sexual harassment that is aligned with national law.
- Integrate provisions related to sexual harassment in the employee Code of Conduct.
- Ensure appointed human resources personnel to manage reports of sexual harassment according to policy.
- The contractor(s) shall require employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse.
- The contractor(s) will implement provisions that ensure that GBV at the community level is not triggered by the project, including:
 - Effective and on-going community engagement and consultation, particularly with women and girls.
 - Review of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes; employment schemes for women; etc.
 - The contractor shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment.
 - 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.

b) Sexual Exploitation and Abuse (SEA)

This impact refers to sexual exploitation and abuse committed by Project staff against community members and represents a risk at all stages of the Project, especially when employees and community members are not clear about prohibitions against SEA in the Project.

Mitigation Measures to Risk of SEA

- ✓ *Develop and implement an SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving*

Major Civil Works (Sept 2018). 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.*

c) Risk of Increased incidences of HIV/AIDS and STIs

The influx of people may bring communicable diseases to the project area, including sexually transmitted infections (STIs), or the incoming workers may be exposed to diseases to which they have low resistance. This can result in an additional burden on local health facilities and resources. Local health and rescue facilities may also be overwhelmed and/or ill-equipped to address the industrial accidents that can occur in a large construction site.

Proposed mitigation measure for this are:

- Contractor(s) to sensitize workers and community members on HIV/AIDS awareness and other communicable diseases to be instituted and implemented as part of the contractor's Health and Safety Management Plan to be enforced by the Supervising Engineer. This will involve periodic HIV/AIDS and other communicable diseases Awareness Workshops for Contractor's Staff.
- Controlled access to contractor's workforce camps by outsiders.
- Contractor(s) to provide standard quality condoms at the construction site during the construction period.

d) Spread of COVID-19 amongst community members during consultations

During consultations for ESIA, various 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 consultations will involve verification of PAPs covering the occupants of the affected area and vulnerable persons and groups; awareness raising, sensitization of PAPs and gauging attitude to the project; training and capacity building for livelihoods restoration grievance redress, execution of site - specific Surveys among others. The activities will lead to close interaction between the proponent and the community members leading to a high risk of spreading Covid-19 amongst community members during the consultation process. To minimize the social risk, measures will be required 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 proponents' team.

COVID-19 mitigation measures

- i. 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;*
- ii. Avoid concentrating of more than 15 community members at one location. Where more than one person is gathered, maintain social distancing of at least 2 meters;*
- iii. 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;*
- iv. Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Ensure to provide and allow participants to provide feedback and suggestions.*
- v. Hold 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.*
- vi. In situations where online interaction is challenging, disseminate information through digital platform (where available) like Facebook and WhatsApp & Chart groups.*
- vii. Ensure online registration of participants, distribution*

e) Spread of COVID-19 amongst workers at construction sites during construction

During project execution (civil works), large numbers of workers will be required to assemble together in consultation engagements, 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.

Covid Mitigation Measures

The Contractors will develop 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 mobilization. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions;

Mitigation measures

- ✓ *Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including workers and visitors*
- ✓ *Avoid concentrating of more than 15 persons or workers at one location. Where more than one person is 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.*
- ✓ *The project shall put in place means to support rapid testing of suspected workers for covid-19;*
- ✓ *Install hand-washing 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;*
- ✓ *Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of work stations, door knobs, hand rails*

f) Child abuse

Children within the project area will be exposed to risks associated with interaction between them and project workers. This includes child labour and sexual abuse which coherently leads to teenage pregnancies and exposure to communicable diseases such as HIV/AIDS.

Mitigation measures

- The contractor will develop and implement a Children Protection Strategy that will ensure minors are protected against negative impacts associated with the project.
- All staff must sign, committing themselves towards protecting children, a contract which clearly defines what is and is not acceptable behavior.
- Children under the age of 18 years will not be hired on site as provided by Child Rights Act (Amendment Bill) 2014.
- Refrain from hiring children for domestic or other labour, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.
- Comply with all relevant local legislation, including labour laws in relation to child labour specifically provisions of Kenya's Employment Act, 2007 (Cap. 226) Part VII on protection of children against exploitation.

g) Impacts related to occupational and public/community safety and health

There are three main types of occupational health and safety hazards that may be of concern. These are physical, chemical and biological. Potential physical hazards will include noise and accidents. Chemical hazards will involve exposure to harmful gases and chemicals by inhalation, ingestion and skin contact. Biological hazards involve exposure to pathogenic organisms which may cause diseases. Specific areas of concern include: noise and vibrations, congestion, body contact, failure to observe social distancing thus exposing other people to COVID-19, poor sanitation, and accidents at the site. Poor sanitation could result from presence of potential environmental pollutants at the site including wastewater, decomposing solid wastes, dust and exhaust emissions. Accidents including cuts, pricks and bruises; electrocution from naked electrical cables; falling in uncovered holes and/or trenches and from raised places and suffocation from lack of oxygen in confined spaces. Accidents could result from lack of supervision and job training, improper handling of machinery and hand tools and inappropriate carrying out of tasks.

Mitigation measures

Mitigation options to some of the impacts have been discussed. Additional mitigation measures to other impacts are:

- Keep all passages clear at all times.
- Remove all soil, boulders, and other heavy materials from the edges of excavations.
- Fence the site for protection, privacy, reduction of trespass and theft, and control of entry by straying animals and therefore avoid conflicts between people at the site and the people in the neighborhood.
- Have a fully equipped First Aid Kit (containing a first aid manual and is equipped with sterile adhesive bandages, safety pins, cleansing agent/soap, latex gloves; sterile gauze

pads triangular bandages, non-prescription drugs, scissors, tweezers and antiseptic amongst others) at the site at all times.

- Put in place an appropriate emergency response plan including having emergency contacts (such as ambulance, fire tender and police) conspicuously displayed.
- Dispose wastes from the site regularly and ensure high standards of cleanliness of all waste collection and disposal facilities.
- Frequently undertake workers through refresher courses in order to make them have a basic understanding of the tasks under them, the hazards involved, and how to manage them.
- Provide appropriate PPE including face masks, goggles, scarfs, boots and overalls among other protective clothing to all workers and people at the site and sensitize them to use them whenever they are in environments that warrant the use of such PPE especially in all situations where the body and skin are potentially exposed to hazards such as harmful dusts, sharp objects, burns and extreme temperature and/or when working in areas that present threatening experiences.

h) Grievances/conflicts

Common grievances expected to arise during the proposed project implementation include:

- ✓ Human and livestock interference with the project;
- ✓ Negative project impacts which may include disruption of income streams, physical harm, and nuisance from construction activities;
- ✓ Health and safety risks;
- ✓ Socially-unacceptable project staff relations with the communities and other stakeholders;
- ✓ Conflicts over water sources; and
- ✓ Pollution and other environmental related impacts.

Mitigation measures

The following are possible mitigation measures to manage grievances:

- Establish a grievance redress mechanism (GRM) for the proposed project;
- Seek to establish amicable relationships with stakeholders and manage the impact of the project activities on affected communities;
- Put in place a pre-emptive community liaison structure aimed at identifying potential issues arising from project-related impacts and addressing them before they become grievances;
- Establish a grievance redress mechanism targeting communities and other project stakeholders but not applicable to commercial and employee-employee relationships, and which will allow stakeholders to easily put forth their concerns relating to the project, implementation and have them addressed in a prompt and respectful manner;
- Ensure the grievance redress mechanism is available to the affected community members and stakeholders at no cost;
- Educate all project stakeholders on the availability and use of the grievance redress mechanism in a manner that is understandable to all, before, during and after construction of the proposed project.

i) Destruction of cultural heritage sites

During construction, sites of cultural significance could be destroyed to pave way for infrastructure development. Such areas in the project include forest sites where religious and cultural practices are conducted. Destruction of such areas may erode the cultural heritage of the community and destroy community cohesion

Mitigation measures

- Proper identification and demarcation of sites of cultural heritage
- Establishing mechanisms for negotiation where disturbance of such sites is inevitable
- Protection of identified cultural sites

5.2 Operation Impacts during the Operation phase

5.2.1 Positive Impacts

a) Employment Creation

Through farming and sale of farm produce and indirectly through the provision of auxiliary services such as marketing, Banking, transport, communication among others

b) Increased income level

The expansion of pan scheme will lead to increased crop production and consequently increased household incomes.

c) Increased productivity

An increased in crop and livestock production which will enhance food security among households in the area. In addition, the increased production will sustain and support expansion of agro-based factories in the country

d) Improved food security

The project will increase food production by irrigation in the area and in the country at large. It will also improve the health status of the people and eliminate malnutrition problems that are prevalent in the area.

e) Extended cropping seasons

The community will have advantage of farming throughout the year compared to other farmers who rely on rain. This will increase their output and consequently their income.

5.2.2 Negative Environmental Impacts during operation phase

a) Vegetation loss

Clearance of vegetation in around the site may expose the soil to erosion and carbon sequestration may be very low

Proposed Mitigation Measures

- Strengthen the existing community based groups that promote establishment of tree nurseries
- Selective felling of trees according to the provisions of the county environment agency
- Creating synergies with farmers, government and non-governmental groups to enhance tree planting

b) Water pollution

The proposed project may cause pollution since the pan will create an opening source for runoff water. Such pollution includes: sediment and particulate organic solids; Particulate bound nutrients, chemicals, such as phosphorous, organic nitrogen, applied with some organic wastes from upstream

Though insignificant in the area, the continued use of biological pesticides upstream may cause non-point pollution to the existing water resources. This might have health implications on those who use the contaminated water. Water containing nutrients from fertilizers may cause eutrophication which causes death of fish and other aquatic biota. Farmers therefore need to be trained on safe use of agricultural chemicals and emphasis on integrated pest management

Proposed Mitigation Measures

- Sensitize farmers on sustainable agriculture practices such as proper use of agrochemicals, river bank conservation, agroforestry and soil conservation
- Educate farmers on Integrated Pest Management practices, dangers of pesticide contamination and conservation of water bodies
- Apply soil and water conservation methods on farms around the catchment areas

c) Solid waste disposal

The solid waste will comprise mainly of packaging materials, soil excavated and rock debris, metal cut offs plastics, cardboards, paper, wood and waste concrete among several others, which can cause water pollution and animal health risks.

Proposed Mitigation Measures

- Establish a waste disposal site for hazardous waste in a location approved by NEMA in accordance with the waste management regulations
- Sensitization of farmers on waste management
- Regular monitoring of waste management status in the farms

d) Soil Erosion

Different types of soil erosion are expected in the area including water erosion and gully. Continuous cultivation on cleared land without conservation measures, and animal tracks and uncontrolled grazing may cause loose soils that become susceptible to erosion. Intensified agricultural practices due to irrigation may accelerate soil erosion in the project area.

Proposed Mitigation Measures

- The design of the pan will provide for conveying and distributing water without triggering soil erosion. The dam will consist and a silt trap and spillways
- Use cover crops to reduce soil displacement by water or wind

e) Siltation

The increase in erosion due to the economic activity upstream may lead to siltation of the proposed pan

Proposed Mitigation Measures

- Construction of silt traps and check dams will assist in collecting mud which can later be removed manually on frequent basis

f) Pests diseases and weed

Irrigated agriculture often provides improved conditions for crop diseases to develop particularly fungal and bacterial foliage diseases. This may lead to hazardous chemicals that can find its way in the food chain. Phosphates tend to be fixed to soil particles and therefore may reach the river when soil is eroded. Local variety of weeds may thrive in the irrigated environment and reduce agricultural productivity

Proposed Mitigation Measures

- Adopt integrated pest management control mechanism, and promote use of bio-pesticides
- Training and awareness programmes on sustainable pest control
- Intensified extension services
- Use of linings, shade and intermittent drying out to complement traditional techniques of mechanical removal

g) Conflicts

Conflicts between farmers and livestock keepers due to destruction of crops

Conflicts may occur when livestock graze on cultivated land

Proposed Mitigation Measures

- Rules for grazing during the cultivation season should be formulated so as to minimize the destruction of crops by animals and to ensure amicable settlements of complaints over crop destruction
- Livestock should not be allowed to cause damage in the irrigated system
- Conflicts should be managed by water committee, if they are beyond the capability of the committee, they should be referred to the local authority or line ministry

h) Increased waterborne diseases

Polluted water is a major cause of human disease. The construction of pan might also lead to an increase in malaria incidences. Schistosomiasis is also a key disease caused by parasitic trematode worms which in their adult form live in the blood stream of human hosts. Aquatic weeds provide an important substrate for the snails. Poor sanitation and poorly constructed sanitary facilities in the fields may also lead to contamination of water bodies leading to the spread of diseases.

Proposed Mitigation Measures

- Proper construction of toilets to prevent infiltration
- Equip health centers with facilities and drugs
- Provision of treated nets to the targeted communities
- Sensitization of the community on prevention of waterborne diseases

i) Occupational health and Safety

The use of pesticides and fertilizers may affect the farmers who handle them through inhalation or indirect skin contact. This may cause complicated health conditions. In addition, once they

are washed into water bodies they may cause contamination and affect downstream users who draw water from the pan

Proposed Mitigation measures

- Ensure that trained first aid personnel are always available on site to handle emergencies.
- Provide appropriate PPE including face masks, goggles, scarfs, boots and overalls among other protective clothing to all workers and people at the site and sensitize them to use them whenever they are in environments that warrant the use of such PPE especially in all situations where the body and skin are potentially exposed to hazards such as chemicals, harmful dusts, highly infectious wastes, sharp objects, burns and extreme temperature and/or when working in areas that present threatening experiences.
- Have a fully equipped First Aid Kit (containing a first aid manual and is equipped with sterile adhesive bandages, safety pins, cleansing agent/soap, latex gloves; sterile gauze pads triangular bandages, non-prescription drugs, scissors, tweezers and antiseptic amongst others) at the site at all times.
- Put in place an appropriate emergency response plan including having emergency contacts (such as ambulance, fire tender and police) conspicuously displayed.
- Frequently undertake workers through refresher courses in order to make them have a basic understanding of the tasks under them, the hazards involved, and how to manage them.

j) Moral decadence

Since project will lead to an increase in income and raise living standards in the area, there is a likelihood of increased social vices such as prostitution theft, alcoholism among others.

Mitigation Measures

- Creation awareness on HIV/AIDs, social responsibility
- Strengthen existing structures that address social responsibility issues

5.2.3 Anticipated health and social impacts during operation phase

a) Health impact – creation of vector and rodents breeding grounds

If the project commences with no well-designed water storage system, water may end up breaking the embankment and creating an open pool of water. This will create conducive breeding areas for mosquitoes and other water based vectors leading to transmission of human diseases like malaria, Schistosomiasis and cholera..

Proposed Mitigation measures

- The embankment must be strong and well designed to prevent any breakages
- Bushes and long grass around the designated pan will be cleared to prevent breeding of mosquitoes.
- The Owaka help group community to facilitate provision of mosquito nets to communities residing within the pan area

b) Social impact – risks of animals and people

The entire area will be fenced and will be provided with a lockable gate. This will prevent entry of animals, children and unauthorized people into the designated areas or become hazardous areas where domestic animals and children may drown.

Proposed Mitigation measures

- ✓ The pan will be fenced to keep off livestock, wildlife and unauthorized people
- ✓ Put warning signs at the irrigation areas to alert children and other people of the dangers associated with the potential cropping areas
- ✓ Carry out public awareness and education as a means against accidental deaths by drowning.

c) Gender based violence and sexual harassment (GBV/SH)

This impact is triggered during project operation phase when the Proponent or project management fail 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:

- Integrate provisions related to sexual harassment in the employee Code of Conduct.
- Ensure all employees and any personnel thereof engaged in the project implementation to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse.
- Implement provisions that ensure that GBV at the community level is not triggered by the project, including:
 - i) Effective and on-going community engagement and consultation, particularly with women and girls.
 - ii) Review of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes; employment schemes for women; etc.
- Develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment.
- 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

This impact refers to sexual exploitation and abuse (SEA) 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 risks of SEA include:

- Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).
- The SEA action plan will include how the project will ensure necessary steps are in place for:
 - i) Prevention of SEA: including Code of Conducts and ongoing sensitization of staff on responsibilities related to the Code of Conducts and consequences of non-compliance; project-level IEC materials.

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- ii) Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management.
 - iii) Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard 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.
 - iv) Management and Coordination: including integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.

e) Risk of Increased incidences of HIV/AIDS and STIs

The influx of people may bring communicable diseases to the project area, including sexually transmitted infections (STIs), or the incoming workers may be exposed to diseases to which they have low resistance. This can result in an additional burden on local health facilities and resources. Local health and rescue facilities may also be overwhelmed and/or ill-equipped to address the industrial accidents that can occur in a large construction site.

Proposed mitigation measure for this are:

- Sensitize workers and community members on HIV/AIDS awareness and other communicable diseases to be instituted and implemented as part of the contractor's Health and Safety Management Plan. This will involve periodic HIV/AIDS and other communicable diseases Awareness Workshops for Contractor's Staff.
- Controlled access to private offices and working places by outsiders.
- Provide standard quality condoms at the site at all times.

f) Grievances/conflicts

Common grievances expected to arise during the proposed project implementation include:

- ✓ Human and livestock interference with the project;
- ✓ Negative project impacts which may include disruption of income streams, physical harm, and nuisance from construction activities;
- ✓ Health and safety risks;
- ✓ Socially-unacceptable project staff relations with the communities and other stakeholders;
- ✓ Conflicts over water sources; and
- ✓ Pollution and other environmental related impacts.

Mitigation measures

The following are possible mitigation measures to manage grievances:

- Establish a grievance redress mechanism (GRM) for the proposed project;

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- Seek to establish amicable relationships with stakeholders and manage the impact of the project activities on affected communities;
 - Put in place a pre-emptive community liaison structure aimed at identifying potential issues arising from project-related impacts and addressing them before they become grievances;
 - Ensure the grievance redress mechanism is available to the affected community members and stakeholders at no cost;
 - Address all raised grievances, real or imagined and take reasonable steps to maintain confidentiality of the parties to the mechanism and regardless of the complainants' participation in this process, give a guarantee that the complainant's statutory rights to undertake legal proceedings remain unaffected; and
 - Educate all project stakeholders on the availability and use of the grievance redress mechanism in a manner that is understandable to all, before, during and after construction of the proposed project.

g) Child abuse

Children within the project area will be exposed to risks associated with interaction between them and project staff. This includes child labour and sexual abuse which coherently leads to teenage pregnancies and exposure to communicable diseases such as HIV/AIDS.

Mitigation measures

- The Proponent will develop and implement a Children Protection Strategy that will ensure minors are protected against negative impacts associated with the project.
- Children under the age of 18 years will not be hired at the site as provided by Child Rights Act (Amendment Bill) 2014.
- Comply with all relevant local legislation, including labour laws in relation to child labour specifically provisions of Kenya's Employment Act, 2007 (Cap. 226) Part VII on protection of children against exploitation.

h) Risk of increased spread of COVID-19

During project operation, there will be a lot of interactions among different people at the site. The potential for the spread of any infectious disease like COVID-19 is high. There is also the risk that the project may experience large numbers of its workforce becoming ill and will need to consider how they will receive treatment, and whether this will impact on local healthcare services including the project host community.

The proposed Mitigation Measures against spread of COVID-19:

- The CBO and County department of health will develop a SOPs for managing the spread of COVID-19 during project operation. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions.
- Mandatory provision and use of appropriate PPE shall be required for all project personnel.
- The project shall put in place means to support rapid testing of suspected workers for COVID-19.

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- Avoid concentrating of more than 15 persons or workers at one location. Where more than one person is gathered, maintain social distancing at least 2 meters.
 - 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.
 - Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs.

i) Impacts related to occupational and public/community safety and health

There are three main types of occupational health and safety hazards that may be of concern. These are physical, chemical and biological. Potential physical hazards will include noise and accidents. Chemical hazards will involve exposure to harmful chemicals by inhalation, ingestion and skin contact. Biological hazards involve exposure to pathogenic organisms which may cause diseases. Specific areas of concern include: noise and vibrations, congestion, body contact, failure to observe social distancing thus exposing other people to COVID-19. Accidents including cuts, pricks and bruises, falling in uncovered holes and/or trenches and from raised places and suffocation from lack of oxygen in confined spaces.

Mitigation measures

Mitigation options to some of the impacts have been discussed. Additional mitigation measures to other impacts are:

- Keep all passages clear at all times.
- Fence the site for protection, privacy, reduction of trespass and theft, and control of entry by straying animals and therefore avoid conflicts between people working in scheme and people in the neighborhood.
- Have a fully equipped First Aid Kit (containing a first aid manual and is equipped with sterile adhesive bandages, safety pins, cleansing agent/soap, latex gloves; sterile gauze pads triangular bandages, non-prescription drugs, scissors, tweezers and antiseptic amongst others) at the site at all times.
- Dispose wastes from the site regularly and ensure high standards of cleanliness of all waste collection and disposal facilities.
- Frequently undertake workers through refresher courses in order to make them have a basic understanding of the tasks under them, the hazards involved, and how to manage them.
- Provide appropriate PPE including face masks, goggles, scarfs, boots and overalls among other protective clothing to all workers and people at the site and sensitize them to use them whenever they are in environments that warrant the use of such PPE especially in all situations where the body and skin are potentially exposed to hazards such as chemicals, harmful dusts, highly infectious wastes, sharp objects, burns and extreme temperature and/or when working in areas that present threatening experiences.

5.3 Anticipated Impacts during the decommissioning phase

Decommissioning refers to the formal process of removing something from the operational status. It requires time in order to properly deal with potential hazards and risks that may be encountered.

5.3.1 Decommissioning activities

A typical decommissioning involves water evacuation from the pipeline securing irrigation infrastructure, demobilization of irrigation systems, pumps and plant and disconnection from the solar powered mains, removal of unstable fills and configuration for long term drainage, which includes measures such as out-sloping, water-barring, ditch removal and a variety to other site specific solutions

The decommissioning exercise will have both positive and negative impacts.

5.3.2 Positive Decommissioning Impacts

Employment Creation

For demolition to take place properly in good time, there will be need to employ people who will be involved in the demolition exercise for the proposed project on its decommissioning.

Rehabilitation

During the decommissioning stage rehabilitation works will be undertaken at the proposed scheme area to restore it to its original state. This will include replacement of topsoil and re-vegetation, which will enhance the aesthetic value of the area

5.3.3 Negative Decommissioning Impacts

a) Solid Wastes

Some of the materials from the demolition shall be used in other construction sites as well as for landscaping activities on site while the remaining portions shall be disposed in accordance with the relevant National Environmental Laws and Regulations.

The solid waste resulting from demolition works will also be managed as follows;

- Provision of facilities for proper handling and storage of demolition materials to reduce the amount of waste caused by damage or exposure to the elements
- Adequate collection and storage of waste on the site and safe transportation to the disposal sites and disposal methods at designed areas be provided

CHAPTER SIX: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

The overall objective of the Environmental Management and Monitoring Plan (ESMMP) is to ensure that mitigation measures of identified adverse effects throughout the design, construction, operation and decommissioning phases are implemented and that they are effective so as to promote the positive effects. It will also enable response to new and developing issues of concern. The ESMMP is vital output of an Environmental Impact Assessment as it provides a checklist for project monitoring and evaluation.

6.1 Responsibilities

The ESMMP has various components with the respective stakeholders involved towards the implementation of the mitigation actions, various persons and organizations are to be involved in the project.

6.2 ESMMP monitoring

There should be continuous monitoring and follow up on the project activities to ensure that the ESMMP is implemented and that its objectives are achieved. The implementing staff, the community, and the contractor should ensure that the mitigation measures are put in place as outlined in the ESMMP.

Table 4: Environmental, social management and monitoring plan during construction phase

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
Clearing of vegetation	<ul style="list-style-type: none"> ✓ Proper demarcation of construction sites to minimize disturbance ✓ Strict control of construction vehicles to ensure that they operate only within the area to be disturbed by access routes and other works ✓ As much as possible, avoid cutting down indigenous tree species of socio-economic importance 	<p>-Acreage of area demarcated and construction sites identified</p> <p>-Acreage area of indigenous trees secluded</p>	<p>reports/photographs</p> <p>-Site plan showing demarcation</p>	Contractor/ Site Engineer	Throughout construction period	Contractor Cost
Soil erosion	<ul style="list-style-type: none"> ✓ The contractor should implement erosion control measures to avoid erosion in areas that are prone to erosion e.g. drainage lines ✓ All excavation works must be properly compacted 	<p>Length in meters of erosion control measures</p> <p>Excavated pan area compacted</p>	-Site plan showing demarcations	Contractor Site Engineer	Construction period	Contractor cost
Air Pollution (dust exhaust)	<ul style="list-style-type: none"> ✓ Vehicles delivering soil material should be covered to reduce dust emissions ✓ Use of dust suppressants ✓ Sensitization of workers on occupational health safety ✓ Workers provided with protective gear like helmets, dust masks, ear muffs when working. 	<p>- No covers for dust emissions for the vehicles</p> <p>No of dust suppressants</p> <p>-workers provided with PPE</p>	<p>-site visit /reports</p> <p>Photographs</p> <p>-Sensitization report</p>	Contractor/ Site Engineer	Construction	Contractor Cost

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	<ul style="list-style-type: none"> ✓ Engines of vehicles and machinery not be left running. ✓ Equipment on the site should be properly maintained so as to emit minimal air pollution 	frequency of vehicle/machine servicing				
Noise Pollution	<ul style="list-style-type: none"> ✓ Workers should be provided with Personal Protective Equipment (PPE) ✓ Sound –attenuated equipment should be used in as much as possible ✓ Ensure use of equipment with exhaust systems in good working condition ✓ Regular servicing of equipment ✓ -Noise levels should be kept within acceptable limits 	<p>-No PPE provided to workers</p> <p>No of cases reported relating to noise pollution</p> <p>frequency of vehicle/machine servicing</p>	Complaints register	Contractor /Site Engineer	Construction Phase	N/A
Solid Waste management	<ul style="list-style-type: none"> ✓ Minimize waste generated ✓ Recycling of the excavated material ✓ Storage of construction waste in designed collection points ✓ Appropriate waste disposal-directly/through licensed waste collectors ✓ 	<p>-No of Designed waste collection points established</p> <p>-No of Waste collection companies engaged</p>	<p>-Waste storage points</p> <p>-Waste disposal facilities/contract collector</p>	<p>Contractor</p> <p>Project management unit</p>	Construction	100,000
Oil spills	<ul style="list-style-type: none"> ✓ Vehicle maintenance should be done on purpose built ✓ Impervious concrete platforms with oil and grease traps. ✓ Standard operating practices 	No of Oil and grease traps established	Records Register on vehicle maintenance	Contractor	Construction phase	50,000

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	for re-fueling mobile equipment such as a minimum 15m from any water channel should be practiced					
Occupational health and safety	<ul style="list-style-type: none"> ✓ Availability of adequate and appropriate sanitary facilities ✓ Ensure workers health and safety throughout the campaign ✓ Train at least one employee on first aid skills ✓ Have fire extinguishers and train workers on how to use them ✓ Have dust suppressants to reduce dust 	<p>No Latrines constructed and in use</p> <p>No of employees trained on first aid skill</p> <p>No of workers trained on use of fire extinguishers</p> <p>No of fire extinguishers installed</p> <p>No of sensitization trainings and participants</p>	<p>Safety records</p> <p>Recorded accidents occurrences and near misses</p> <p>OSH sensitization conducted</p>	Contractor	Construction	200,000
Anticipated Health and Social Impacts						
COVID 19 Spread of COVID-19 amongst community members during consultations processes	<p>Electronic means of consulting stakeholders and, holding meetings, whenever possible, shall be encouraged whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced;</p> <ul style="list-style-type: none"> ✓ Avoid concentrating of more than 15 community members at one location. ✓ Maintaining social distancing 	<p>No of trainings and participants</p> <p>No of Training material, PPE, sanitizing facilities</p> <p>No. of participants registered online.</p> <p>No of recordings on of use of electronic</p>	<p>Purchasing orders, Receipts</p> <p>Reports of the trainings with list of participants</p>	<p>All the Project components</p> <p>Supervising Eng. & Contractor</p> <p>Communication / stakeholder engagement expert in the Team</p>	Construction phase	100,000

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	<p>at least 2 meters</p> <ul style="list-style-type: none"> ✓ The team will be provided with appropriate PPE such as masks for them and for the number of people they intend to meet; mainly in form of FGDs ✓ Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants 	<p>media for information dissemination/engagement e.g. printed electronic mails, addresses of video links created etc</p>				

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
Gender-based Violence (GBV) at the community level	<ul style="list-style-type: none"> ✓ Effective and on-going community engagement and consultation, particularly with women and girls; ✓ Review and updating of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes; employment schemes for women; delivery of water supplies; etc. 	<p>Number of SEA action plans prepared</p> <p>Code of conduct prepared</p> <p>Number of staff trainings on SEA held.</p> <p>-Number of PSEA community liaison trainings carried out</p> <p>Number of IEC materials available</p>	<p>GBV plans</p> <p>Attendance registers</p> <p>GBV action plans</p>	<p>Supervision</p> <p>Consultant</p> <p>GBV Expert</p>	1 month	50,000
Sexual Exploitation and Abuse by project workers against community members	<ul style="list-style-type: none"> ✓ Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018). 	<p>SEA Action Plan</p> <p>Code of Conduct</p> <p>Number of staff trainings</p> <p>SEA FP</p> <p>Community Liaison trained in PSEA</p> <p>IEC materials for workers' sites and community</p> <p>Discrete SEA reporting pathway</p>	<p>SEA action plan</p> <p>Attendance registers</p>	<p>Contractor</p> <p>GBV Expert</p>	1 month	20,000
Risk of Increased incidences of	<ul style="list-style-type: none"> ✓ Contractor(s) to sensitize workers and community 	<p>Number of persons by gender sensitized</p>	<p>Reports</p>	<p>Contractor,</p>	Continuous	20,000

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
HIV/AIDS and STIs	<p>members on HIV/AIDS awareness and other communicable diseases as part of the contractor's Health and Safety Management Plan</p> <p>✓ Contractor(s) to provide standard quality condoms at the construction site during the construction period.</p>	<p>Cartons of condoms distributed and to the 2relevant persons</p> <p>Number of sensitization workshops</p>				
Child abuse	<p>✓ Comply with all relevant local legislation, including labour laws in relation to child labour</p> <p>✓ Refrain from hiring children for domestic or other labour, which is inappropriate given their age, or developmental stage,</p>	<p>Number and type of child abuse incidences reported</p>	<p>Reports</p> <p>Existing records at the Children centers</p>	<p>Contractor/Project Management Unit</p>	<p>Biannually</p>	<p>-</p>
Impacts related to occupational and public/community safety and health	<p>✓ Have a fully equipped First Aid Kit (containing a first aid manual and is equipped with all the necessary accessories) at the site at all times</p> <p>✓ Provide appropriate PPE including face masks, goggles, scarfs, boots and overalls among other</p>	<p>Number of Fully equipped first Aid Kits available</p> <p>Number of reported accidents</p>	<p>Reports</p>	<p>Contractor/Project Management Unit</p>	<p>Continuous</p>	<p>20,000</p>

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	protective clothing to all workers and people at the site and sensitize them					

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
Grievances/conflicts	<ul style="list-style-type: none"> ✓ Establish a grievance redress mechanism targeting communities and other project stakeholders but not applicable to commercial and employee-employee relationships ✓ Ensure the grievance redress mechanism is available to the affected community members and stakeholders at no cost ✓ Address all raised grievances, real or imagined and take reasonable steps to maintain confidentiality of the parties to the mechanism and regardless of the complainants' ✓ Educate all project stakeholders on the availability and use of the grievance redress mechanism in a manner that is understandable to all, 	<p>Number of reported cases on grievances</p> <p>Number of sensitization awareness creation workshops on GRM</p> <p>Number of community members trained on GRM</p>	<p>Reports</p> <p>Existing records</p>	Contractor, Project Management Unit	Continuous	20,000
Destruction of cultural heritage sites	<ul style="list-style-type: none"> ✓ Proper identification and demarcation of sites of cultural heritage ✓ Establishing mechanisms for 	<p>Affected cultural sites in the project area</p> <p>Number of mechanisms/meetings</p>	<p>Reports</p> <p>Photos</p> <p>Existing records at the county government office</p>	in case of chance find the contractor will secure the area and notify the NMK and	Construction period	-

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	negotiation where disturbance of such sites is inevitable ✓ Protection of identified cultural sites	undertaken		County Department of Culture National Museums of Kenya and County department of Cultural services Contractor		
Sub Total:	ESMMP Construction phase					580,000

8.4 Environmental Social, Management and monitoring plan during operation phase

The environmental management and monitoring plan for the operational phase provides specific guidance related to the operational activities associated with the irrigation project. It is centered on sound environmental management practices that will be undertaken to minimize adverse impacts on the environment through normal operations of irrigated agriculture. The plan further identifies measures to be taken in an event of emergencies or incidences during the operation of the scheme. The table below shows operation phase of the irrigation project

OPERATION PHASE

Table 5: Environmental Social Management and Monitoring plan for operation phase

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
Water pollution	<ul style="list-style-type: none"> -Sensitize farmers on sustainable agricultural practices, river bank conservation, agroforestry, soil conservation -Educate on integrated pest management dangers of contaminating the Soil with synthetic fertilizers -Regular water monitoring 	<ul style="list-style-type: none"> No and types of conservation measures adopted by beneficiaries or proportion of beneficiaries adopting soil and conservation -Trees plant along with crop -No of Framers practicing Inegrated Pest Management - No of Regular pan water quality d 	<ul style="list-style-type: none"> -Training reports/photographs -Field observations on number of trees planting along with crop production -Minutes of community meetings 	<ul style="list-style-type: none"> Project Management Unit in collaboration with the CBO Sub County Agricultural office 	Throughout operation period	100,000
Siltation	<ul style="list-style-type: none"> -Frequent removal of mud from the silt trap 	<ul style="list-style-type: none"> - Silt levels in the silt trap 	<ul style="list-style-type: none"> -Reports on status of silt in the pan 	<ul style="list-style-type: none"> Project Management Unit in collaboration with the CBO Sub County Agricultural office 	Throughout operation period	150,000
Solid Waste management	<ul style="list-style-type: none"> -Establish waste disposal site for hazardous waste in allocation approved by NEMA in accordance with waste management regulations --Designed waste collection points 	<ul style="list-style-type: none"> -Number of Waste deposition points 	<ul style="list-style-type: none"> Monitoring Reports 	<ul style="list-style-type: none"> Project Management Unit in collaboration with the CBO 	Throughout operation period	50,000

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	established -The disposal site need to be more than 100 meters from water course and in a position that will facilitate prevention of storm water run-off from the site from entering the pan	-Number Waste disposal facilities/contract collector		Sub County Agricultural Engineer		
Soil Erosion	-Use of cover crops to reduce soil displacement by water upstream -Establish tree nurseries -Plant trees and grass along the embankments of the pan - Promote agroforestry practices in the catchment areas	No and type Cover crops used to reduced water displacement No of tree nurseries No of trees planted and grass cover	Report Field observation	Pan Management Unit	Operation period	100, 000
Pest, disease and weeds	-Training and awareness programmes on sustainable pest control -Adopt integrated pest management control mechanisms -Intensified extension services	No of persons trained IPM mechanism adopted Extension services provided/intensified	Reports Photographs	Project Management Committee County Agricultural Office	Operation period	200,000
Conflicts	-Build capacity of local conflict resolution mechanisms -Conflict among beneficiaries over water access and utilization	Number of farming communities trained on conflict resolution Number of beneficiaries targeted Water committee be	Reports Fewer incidences of conflicts	Project management Committee Community members project implementation team	Operation period Operation period	50,000

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	-Conflict among beneficiaries over allocation of the operations and maintenance costs	established responsible for resource mobilization			Operation period	
Water borne diseases	-Provision of treated nets to the targeted communities -Equip health centers with drugs -Provision of water treatment tablets	No Mosquito nets provided No Health centers equipped Amount Water treatment tablets provided Communities sensitized	Number of targeted households provided with Mosquito nets, Water treatment tablets and sensitized	Project management Committee Community members project implementation team	Operation period	
Occupational Health Safety	All health risks equipment must be cleared from the project site Adopt integrated pest and control	No and type of health risk equipment cleared Integrated pest and disease control adopted	Number of health risk equipment cleared Report on activities adopted on integrated pest and diseases control Reports Field visits	Project management Committee Community members project implementation team	Operation period	
Covid 19	<ul style="list-style-type: none"> ○ Mandatory provision and use of appropriate Personal Protective Equipment (PPE) ○ Avoid concentrating of more than 15 workers at one location. ○ Maintain social distancing at least 2 meters. 	No Availability of: SOP(s), No of Training material, PPE, Sanitizing facilities, Installed	SOPs, Project assessment reports, Purchase orders/receipts, Photos	All the Project components	monthly	100,000

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	<ul style="list-style-type: none"> ○ 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. 	handwashing equipment				
Anticipated Health and Social Impacts						

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
Social impact – risks of animals and people entering the pan without consent of the concerned authorities	<ul style="list-style-type: none"> ✓ Put warning signs at the pan site to alert children and other people ✓ Carry out public awareness and education. ✓ 	<p>Number and specific sites where warning signs are placed</p> <p>Number of public awareness meetings</p>	<p>Reports</p> <p>Photos</p>	Pan management committee	Continuous	20,000
Gender-based Violence (GBV) at the community level	<ul style="list-style-type: none"> ○ Effective and on-going community engagement and consultation, particularly with women and girls; ✓ Review and updating of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes; employment schemes for women; delivery of water supplies; etc. 	<p>Number of SEA action plans prepared</p> <p>Code of conduct prepared</p> <p>Number of staff trainings on SEA held.</p> <p>-Number of PSEA community liaison trainings carried out</p> <p>Number of IEC materials available</p>	<p>GBV plans</p> <p>Attendance registers</p> <p>GBV action plans</p>	<p>Supervision Consultant</p> <p>GBV Expert</p>	Continuous	20,000
Sexual Exploitation and Abuse by project workers against community members	<ul style="list-style-type: none"> ✓ Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank’s Good Practice Note for Addressing Gender-based Violence in Investment 	<p>SEA Action Plan</p> <p>Code of Conduct</p> <p>Number of staff trainings</p> <p>SEA FP</p> <p>Community Liaison trained in PSEA</p>	<p>SEA action plan</p> <p>Attendance registers</p>	<p>Contractor</p> <p>GBV Expert</p>	Continuous	-

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	Project Financing involving Major Civil Works (Sept 2018).	IEC materials for workers' sites and community Discrete SEA reporting pathway				

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
Risk of Increased incidences of HIV/AIDS and STIs	<ul style="list-style-type: none"> ✓ Sensitize workers and community members on HIV/AIDS awareness and other communicable diseases to be instituted and implemented as part of the contractor's Health and Safety Management Plan, 	<p>Number of awareness, creation, consultative workshop/meetings</p> <p>Number of condoms distributed</p>	Reports	Project management unit County public health	Continuous	20,000
Grievances/conflicts	<ul style="list-style-type: none"> ✓ Put in place a pre-emptive community liaison structure aimed at identifying potential issues arising before they become grievances; ✓ Ensure the grievance redress mechanism is available to the affected persons at no cost; ✓ Address all raised grievances, real or imagined and take reasonable steps to maintain confidentiality of the parties to the mechanism and regardless of the complainants' 	<p>Number of conflict related cases reported and addressed</p> <p>Number of awareness creation workshops/meetings</p>	Reports	Pan management unit	Continuous	10,000
Child Abuse	<ul style="list-style-type: none"> ✓ Develop and implement a Children Protection Strategy that will ensure minors are protected ✓ Comply with all relevant local legislation, including labour laws in relation to child labour specifically provisions 	<p>Number of child abuse related cases reported and addressed</p> <p>Number of awareness creation workshops/meetings</p>	Reports	Pan management unit County department of Social services	Continuous	10,000
Spread of COVID-19 amongst workers	<ul style="list-style-type: none"> ○ The Contractor will develop a SOPs for managing the spread of Covid-19. The SOPs shall be 	Number of PPEs supplied	Reports	Pan amangement Unit County department of public	Continuous	10,000

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	<p>in line with the World Bank guidance on COVID-19, Ministry of Health Directives, and site-specific project conditions.</p> <ul style="list-style-type: none"> ○ Mandatory provision and use of appropriate Personal Protective Equipment (PPE) ○ Avoid concentrating of more than 15 workers at one location. ○ Maintain social distancing at least 2 meters. ○ Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues 	<p>Number of hand washing facilities</p> <p>Amount in liters of sanitizers and liquid soap</p>		health		
occupational and public/community safety and health	<ul style="list-style-type: none"> ✓ Have a fully equipped First Aid Kit (containing a first aid manual and is equipped with accessories) at the site at all times. ✓ Provide appropriate PPE including face masks, goggles, scarfs, boots and overalls among other protective clothing to all workers and people at the site 	<p>Number of first Aid Equipment</p> <p>Number of awareness sensitization workshops/ meetings</p>	Reports	<p>Pan management Unit</p> <p>County department of Social services ,</p> <p>County department of public health</p>	Continuous	10,000
Total ESMMP Cost for Operational Phase						900,000

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
Grand Total cost of ESMMP						1,460 ,000

8.6 EMMP for the Decommissioning phase

Decommissioning refers to the formal process of removing something from the operational status. This being the final phase in the project cycle, decommissioning may present possible opportunities associated with the return of the land for alternative use. However, depending on the nature of the operational activity, the need to manage risks and potential residual impacts may remain well after operation ceased

The EMMP will direct the initial stages of decommissioning phase. The table below shows the EMMP of the decommissioning phase for the irrigation project.

Table 6: EMMP for decommissioning phase of proposed project

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
Demolition Waste	-Use an integrated solid waste management system i.e. Through a hierarchy of options: Recycling Reuse; Sanitary land filling	Registered waste collector engaged	Inspection and observation	Contractor	One-off	50,000
Occupational health and safety risks	-Adherence to the Occupational Health and Safety Rules and Regulations stipulated in the occupational Safety and Health Act, 2007 -Provision of appropriate personal protective equipment	Number of reported incidences	Inspection and observation	Contractor	Throughout decommissioning period	5000
Total cost of decommissioning						155,000

CHAPTER SEVEN: CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

The proposed project presents multiple environment and social benefits including: Increased agricultural production, increased household incomes, local economic growth and enhanced climate resilience in the region. It will also allow for optimal use of natural resources in the County. On the other hand, the project could spur negative environmental impacts. These include: vegetation clearance during expansion and rehabilitation of the pan infrastructure; intensified water use conflicts or access to the water points, siltation and encroachment into sensitive ecosystems. The negative impacts however can be mitigated through technical design consideration, community sensitization, strategic partnerships, staff capacity building- implementing agencies and continuous monitoring of environmental conditions against the baseline

7.2 Conclusion

From the findings of the study that is detailed in this report, the Kogola water pan project will play an important role in improving the livelihoods of the local community through increased and improved agricultural production. It will enhance food security, generate local employment and increased household incomes of targeted Akoko Village members and the larger community

9.3 Recommendations

In addition, to following the laid down guidelines and according to the information collected, collated and analyzed during the study, it is the lead experts considered opinion that:



- The project DOES NOT pose any irreversible environmental impacts identified that are generally related to development projects and the mitigation measures for those that have been clearly articulated;
- The project will bring positive environmental impacts that surpass the few and minor negative impacts identified. The negative environmental impacts are addressed by the detailed environmental management plan, which will be executed during the project implementation and operation phases to safeguard the environmental interests
- The proponent has agreed to adhere to the laid down laws and procedure of NEMA in setting up the project. Its successful implantation will contribute to the economic growth of the country in regards to poverty eradication as well as reducing the water use conflicts
- The proposed project is a socially environmentally and economically viable venture that benefits support in order to contribute to the Vision 2030 development goals; its implementation will be beneficial to the country through its contribution to food security, poverty eradication and improved water resource management and reduced water related conflicts
- A copy of the environmental and social management plan must be given to the contractor prior to construction. The contractor needs to demonstrate how the ESMP will be implemented in the construction process.

REFERENCES

- Constitution of Kenya (2010)
- Community Land Act (2016)
- County Integrated Development Plan (CIDP 2018-2022) (Siaya County)
- Environmental Assessment Sourcebook, Vol. 2: Sectorial Guidelines. World Bank Technical Paper 140, 1991.
- Environmental Assessment Sourcebook, Vol. 3: Guidelines for Environmental Assessment of Energy and Industry Projects. World Bank Technical Paper 154, 1991.
- Government of Kenya (2000), Environment Management Coordination Act Cap 387
- Government of Kenya (2008), Kenya vision 2030, Government printer, Nairobi
- Government of Kenya (2019). Agricultural Sector Transformation and Growth Strategy 2019-2029
- Government of Kenya (2016), National Environmental Action Plan Preparation Guidelines. National Environment Management Authority, Nairobi
- Kenya gazette supplements Acts 2000; The Environmental Management and Coordination Act Number 8 of 1999. *Government Printer Nairobi*
- Kenya gazette supplement Acts, Public Health Act (Cap 242) Government printer, Nairobi
- Kenya gazette supplement Acts, Water Act 2000 by Government printer, Nairobi
- Kenya gazette supplement Number 56, Environmental Impact Assessment and Audit Regulations 2003 Government printer, Nairobi
- Kenya gazette supplement Acts, Occupational Safety and Health Acts 2007 by Government printer, Nairobi
- Kenya gazette supplement Acts, The Factories and Other Places of Work Act, (Cap 514) by Government printer, Nairobi
- Kenya National Bureau of Statistics (KNBS). (2014). Economic Survey report of Kenya.
- Legal notice No. 101 published by the NEMA in 2003. Environmental (Impact and Audit) regulations
- Sambroek, W.G., H.M.H Braun and B.J.A van der Pouw (1982) Exploratory Soil Map and Agro- Climatic zone map of Kenya 1980. National Agricultural Laboratories Kenya Soil Survey. Republic of Kenya

ANNEXES

Annex 1: Duly Filled ESS Screening Checklist

Sub Project Screening Checklist

Section A: Background information

Name of County.....SIAYA.....

Name of CPCU/NEMAJ. PARLIAMENT.....SIAYA.....

Sub-project location...CENTRAL SAKWA/COLLEGE SAKWA WARD (AKOHO)

Name of CBO/Institution...KOLWA WATER PAN.....

Contact Person...BOAZ...JULENA..... Cell phone...0720274741.....

Sub-project name...BOAZ...JULENA...D.C. KOLWA WATER PAN

Estimated cost (Ksh.)9. M.....

Approximate size of land area available for the Micro-project...5.6 Ha

Objectives of the micro project.....

.....~~WOOD~~.....RENTAL CONTRACT...D.F. THE WATER PAN.....

.....TREE PLANTING.....FISH FARMING.....AND.....HONEYBEE.....

Activities/enterprises undertaken...wood...keeping...and...poultry...keeping...Indigenous vegetables.

How was the Micro-project chosen?...Community...Decision

Expected micro project duration.....6...months.....

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?		✓
Cause poor water drainage and increase the risk of water-related diseases such as malaria?	✓	
Reduce the quantity of water for the downstream users?		✓
Result in the lowering of groundwater level or depletion of groundwater?		✓
Create waste that could adversely affect local soils, vegetation, rivers and streams or groundwater?		✓
Reduce various types of livestock production?		✓
Affect any watershed?		✓
Focus on Biomass/Bio-fuel energy generation?		✓

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

Section C: Socio-economic Issues

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

Section D: Natural Habitats

Will the sub-project:	YES	NO
Be located within or near environmentally sensitive areas (e.g. intact natural forests, mangroves, wetlands) or threatened species?		
Adversely affect environmentally sensitive areas or critical habitats – wetlands, woodlots, natural forests, rivers, etc.)?		
Affect the indigenous biodiversity (Flora and fauna)?		
Cause any loss or degradation of any natural habitats, either directly (through project works) or indirectly?		
Affect the aesthetic quality of the landscape?		
Reduce people's access to the pasture, water, public services or other resources that they depend on?		
Increase human-wildlife conflicts?		
Agrochemical use		
Will the micro-project:		
Involve the use of pesticides or other agricultural chemicals, or increase existing use?		
Cause contamination of watercourses by chemicals and pesticides?		
Cause contamination of soil by agrochemicals and pesticides?		
Experience effluent and/or emissions discharge?		
Export produce? Involve annual inspections of the producers and unannounced inspections?		
Require scheduled chemical applications?		
Require chemical application even to areas distant away from the focus?		
Require chemical application to be done by vulnerable group (pregnant mothers, chemically allergic persons, elderly, etc.)?		
Use irrigation system in its implementation?		

6. Training

a) Have you ever received any training on any of the following topics related to crop production?

Integrated Pest Management Yes..... No.....
No. of times/past year.

b). Pesticide Usage Yes..... No.....
No. of times/past year.

c). Pesticide Safety: Yes..... No.....
No. of times/past year.

d). Insect Identification Yes..... No.....
No. of times/past year.

e). Disease Identification Yes..... No.....
No. of times/past year.

f). Quality aspects of production Yes..... No.....
No. of times/past year..... *N/A*

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

.....
.....
.....

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

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

Are there:	Yes	NO
People who meet requirements for OP 4.10 living within the boundaries of, or near the project?		✓
Members of these VMGs in the area who could benefit from the project?		✓
VMGs livelihoods to be affected by the sub project?		✓

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

Section G: Land Acquisition and Access to Resources

Will the sub-project:	Yes	No
Require that land (public or private) be acquired (temporarily or permanently) for its development?		✓
Use land that is currently occupied or regularly used for productive purposes (e.g. gardening, farming, pasture, fishing locations, forests)		✓
Displace individuals, families or businesses?		✓
Result in temporary or permanent loss of crops, fruit trees and pastureland?		✓
Adversely affect small communal cultural property such as funeral and burial sites, or sacred groves?		✓
Result in involuntary restriction of access by people to legally designated		✓

parks and protected areas?		✓
Be on monoculture cropping?		✓

If the answer to any of the above is 'yes', please consult the mitigation measures in the ESMF, and if needed prepare a (Resettlement Action Plan) RAP.

Section H: Proposed action

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

(iii) Recommended Course of Action

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

- CPCUs and County Director of Environment (CDE) will provide detailed guidance on mitigation measures as outlined in the ESMF; and
- Specific advice is required from CDE and CPCUs regarding sub-project specific EIA(s) and also in the following area(s)
- All sub-project applications/proposals MUST include a completed ESMF checklist. The KCSAP-CPCU and CDE will review the sub-project applications/proposals and the CDEs will sign off;
- The proposals will then be submitted to NPCU for clearance for implementation by communities in the proposed subprojects.

Expert Advice

- The National Government through the Department of Monuments and Sites of the National Museums of Kenya can assist in identifying and, mapping of monuments and archaeological sites; and
- Sub-project specific ESIA's, if recommended, must be carried out by experts registered with NEMA and be followed by monitoring and review. During the process of conducting an EIA the proponent shall seek views of persons who may be affected by the sub-project. The WB policy set out in OP 4.01 requires consultation of sub-project affected groups and disclosure of EIA's conclusions. In seeking views of the public after the approval of the sub-project, the proponent shall avail the draft ESIA report at a public place accessible to project-affected groups and local NGOs/CSOs.

Completed by: BOAZ OTIENO MARACI

Name: _____

Position / Community: CHAIRPERSON OF THE WATER PAN

Date: 8/05/2021

Field Appraisal Officer (CDE): William Odongo

Signature: [Handwritten Signature]

Date: _____

Annex 3: Minutes of the Community Consultation Meetings

MINUTES OF THE COMMUNITY BARAZA/MEETING ON FOR PROPOSED REHABILITATION AND EXPANSION OF KOGOLA WATER PAN IN AKOKO VILLAGE, WEST MIGWENA WARD, BONDO SUB COUNTY IN SIAYA COUNTY HELD ON 4th NOVEMBER, 2021 AT AKOKO VILLAGE AT 10.00 AM

Members Present:

List attached

Agenda

Project Brief

Community Sensitization on ESIA

Public participation

AOB

Min 1/4/11/2021: Introduction

The meeting commenced at 11a.m with a word of prayers from the Mr Benard Ongiya Chairman of the proposed rehabilitation and expansion of water pan. He welcomed the participants and informed the meeting that there is a serious water scarcity problem in the region. He welcomed the visitors from Kenya Climate Smart Agriculture Project (KCSAP) Siaya County office and Nairobi and expressed their happiness for receiving the visitors again. He then introduced the County Project Coordinator Siaya County office Mr Willis Atiang and Mr Benard Ayagah the (KCSAP) County Environment and Social Safeguards officer.

Min 2/4/11/2021: County Project Coordinator-Kenya Climate Smart Project (KCSAP's) Remarks

The CPC welcomed the participants and he made reference to the screening exercise which undertaken at the community level. He gave a brief highlight on the objective of the visit and the need to conduct an Environmental Impact Assessment on the proposed rehabilitation and expansion of Kogola water pan in Akoko Village. He at the same time briefed them on their proposal of how to undertake selective bush clearing and excavation, during opening up of land for the expansion and rehabilitation construction. He further narrated the importance of the Environmental Impact Assessment Exercise and called on proper attention to the lead experts' quest for further clarifications.

Min 3/4/11/2021: -Kenya Climate Smart Agriculture Project (KCSAP) County Environment and Social Safeguards officer (CESSCO) Mr Benard Ayagah

Welcomed the participants and gave brief highlight on how a screening checklist was conducted to determine the nature of the project its impacts and whether it can be categorized as a Summary Project Report. A brief highlight on activities that will be undertaken during the project cycle. Among the activities are Fencing and gates, establishment of community water points (Six in number) Construction of Wash room and toilet facilities (Two in number) Tree nursery establishment Aquaculture (stocking of fish), Catchment protection and conservation, Water pumping and reticulation undertake Community Capacity building, provision assorted agricultural inputs / labor, undertake Clearing and Murruming Access Road by the community under community share contribution of the project and provision of Land

He further reported on the community were engaged and participated in undertaking a feasibility study by the Irrigation Engineer and designs have been produced.

Min 3/ 4/11/2021Project Brief

The chairman Mr Benard Ogayao from the community gave brief overview of how the project started. Mr Lukas Ojalo Omoso informed the participants that the pan was first constructed in 1958 during the colonial era and water lasted in the pan for around 14 years after which the lifespan of the pan started declining. Since the breaking of the banks, there has been rehabilitation and constructions with the last one being done by county government and it was not successful.

Mr Lukas emphasized that construction or rehabilitation should not be haphazard it must be done to last for a longer period atleast more than 15 years

Mr Okumu Umayya informed the participants that there are so many unemployed youths in the village and the pan will create employment the youth can operate tree nurseries, undertake pan maintenance.

Min 4/ 4/11/2021 Community Consultation/Sensitization on ESIA

The ESIA expert mentioned the need for public participation in Environmental Impact Assessment as a priority and legal requirement by the Government of Kenya, He enlightened the participants about ESIA; its purpose objectives; legal framework including legislation and policies governing environment; the rights and role of community towards environmental protection and management. He further took the community through selected legislation governing the environment including the new constitution

The community was informed that it is mandatory to hold at least one baraza to give the community/neighbors/stakeholders an opportunity to give their views with respect to the benefits; impacts both negative and positive in order to establish whether the project is economically viable, socially accepted and environmentally friendly/sound

Min 5/ 4/11/2021: Community participation

The ESIA lead expert guided the community members on procedures of giving their opinion and that each speaker was to follow but not limited to the following criteria:

- Personal identification by: location names, age, gender, mobile telephone number
- Indicate whether he or she is aware of the proposed expansion, rehabilitation, construction and its related activities incidental thereto and connected therewith the under the Kenya Climate Smart Agriculture Project? Yes/No
- Give opinion on the expected benefits from the irrigation project
- Give opinion on the anticipated negative/adverse impacts that may result from this project and related activities
- Propose mitigation measures to avoid, alleviate or reduce the adverse effects
- Identify any conflict, complaints expected to arise due to expansion, rehabilitation and construction
- Suggest ways to resolve conflict, complain amicably

The community beneficiary opinions were documented below:

Madam Emma Achieng informed the members that if the project was in place then food would be available and the problems of food insecurity and increased malnutrition levels would be minimized. Food availability at household will be enhanced. She reported that proposed project is capable of generating employment for the youth in the village who are currently jobless

Community youth representative Maurice Willis echoed the sentiments of Lydia that definitely there will be employment creation. The project will open avenues for the youth to produce horticultural produce, maize and sell as food and Stover's as feed for livestock. Pulses like green grams, cowpeas will also be available. It will also cushion conflict between livestock keepers and the farmers who plant crops.

When asked about benefits of proposed water project they identified the following;

1. Employment creation
2. Crops for household consumption and selling
3. The irrigated crops will increase household income promote fodder for livestock upkeep and enhance the food security status of the community
4. The project will sensitize the community on planting of appropriate crop types, pasture and conservation of animal feeds

Min 6/4/112021: Possible adverse effects of the project and suggested mitigations

- The community were unanimous that there will be no serious negative environmental impacts resulting from the irrigation scheme rehabilitation activity.
- However, some minimal environmental degradation as a result of selective bush clearing and thinning might occur while opening the area for expansion during excavation
- There will be removal of selected vegetation creating open spaces that would be used for crop and pasture development,
- However, the removed vegetation would be mitigated by planting palatable forage for livestock which would still cover the soil around the embankments and catchment areas.
- Establishment pan management committee to coordinate access and utilization of water facilities

Min 7/4/11/2021: A.O.B

OWNERSHIP OF THE LAND TO BE OCCUPIED BY THIS PROJECT INVESTMENT?

The Community participants reaffirmed that the land is registered as a community land under the custody of the county government. The land has a title deed and it was allocated for development of a water pan.

CONSENT FOR THE PROJECT

The Community members present agreed unanimously gave consent for the project.

The NEMA Expert thanked the Community for giving consent for project implementation. He stated that the Community response to the ESIA exercise will go to the experts to facilitate issuance of other certification.

CLOSING REMARKS

The County Project Coordinator thanked the participants for attending the meeting and informed them that he will be available frequently during project implementation to monitor progress. He noted that success of the project depends on all stakeholders The Management Committee from the community must remain as a family and know that there will be maintenance cost.

There being no other business to discuss to discuss, the meeting was closed with a word of prayer at 2.30 pm.

Signed 

Date 4/11/2021

Lead Expert Mr Fredrick Aloo
Taking Minutes

Annex 4: Attendance list



Kenya Climate Smart Agriculture Project (KCSAP)



Office of the CPCIU - Siaya

REGISTRATION FORM

ACTIVITY: Public Participation with KASAP Stakeholders DATE: 24/11/2021

NO	NAME	ORGANIZATION	DESIG	CONTACT		SIGN
				MOBILE	EMAIL	
1.	Geordina Othman	Kasapla Water PWD Commission	MLP Commissioner	0722649295		<i>Geordina</i>
2.	Susan Nilon Go	Land Admin Mbari	CSA RDC	0723414683	denkembari@gmail.com	<i>Susan</i>
3.	Fredrick Koo	Land Admin Mbari	RDC	0726891112	fredrickoo@gmail.com	<i>Fredrick</i>
4.	AMBASSA ELAKUM	DDAF	POE	072445003	ambassa.elakum@gmail.com	<i>Elakum</i>
5.	Elijah Luvuvu	Mbari Mbari	Land Admin RDC	07229676279	luvuvalak@gmail.com	<i>Elijah</i>
6.	BLAISE OIKINYI	Mbari Mbari	RDC	0721158798	blaiseoikinyi@gmail.com	<i>Blaise</i>
7.	Chery Allugu	Ngora Mbari	POE	0724798544	cheryallugu@gmail.com	<i>Chery</i>
8.	GLORIA AKOITH	Mbari	POE	07100253393	gloriakoth@gmail.com	<i>Gloria</i>
9.	Peter Ganga	Mbari	POE	0721849561	peterganga@gmail.com	<i>Peter</i>
10.	Alfred Owalo	Mbari	POE	0724087141	alfredowalo@gmail.com	<i>Alfred</i>

P. O. Box 3 - 40600, SIAYA

Mob: +254 722 943269



Kenya Climate Smart Agriculture Project (KCSAP)



Office of the CPCU - Siaya

REGISTRATION FORM

ACTIVITY: Visits on PROPOSED STRES AND CRITERIA WITH Community members

DATE 02/11/2021

NO	NAME	ORGANIZATION	DESIG	MOBILE	CONTACT		SIGN
					EMAIL		
1.	CHAUDE EQUITI	Kisumu in part community member	MEMBER	0716796939		Chaudefequi@gmail.com	CA
2.	ACHISNUK RUMUKUS	Kisumu water pump	MEMBER	0707246856			ACH
3.	KEVIN CUMA OMBODI	Kisumu water pump	MEMBER	0716240363			KEVIN
4.	BONZA DILEND HIRIBELI	COMMUNITY	CHAIRMAN	071200923529			BONZA
5.	JANE AMISILE	COASTAL MERRIBIDAU	COMM MEMBER				JANE
6.	ELSA STELEDO	WAGADA WAGIA COMM	MEMBER	0717124750			ELSA
7.	CAROLINE SAGIA	FOGOLA W. PWD	Comm MEMBER				CA
8.	PETER ANJOO OPIGE	K. GOLA W. PWD	MEMBER	0722-220766			PETER
9.	JARED OMBENGA ABIRI	K. GOLA W. PWD	MEMBER	0711205526			JARED
10.	SUSAN ODHUMBO	K. GOLA W. PWD	MEMBER	0790583400			SUSAN

ENVIRONMENTAL SOCIAL IMPACT ASSESSMENT (ESIA) FOR PROPOSED REHABILITATION AND EXPANSION OF KOGOLA WATER PAN IN AKOKO VILLAGE, GARSEN SOUTH SAKWA WARD, BONDO -SUB COUNTY IN SIAYA COUNTY

County Project Coordinator (CPC), Kenya Climate Smart Agricultural Project (KCSAP), Ministry of Agriculture, Livestock and Fisheries. P.O. Box 3 - 40600 Siaya intends to establish an irrigation project under their Investment structures in Hewani village in Siaya County.

To ensure that the project is implemented in an environmentally and social sound manner, the proponent the **County Project Coordinator (CPC)**, Kenya Climate Smart Agriculture Project (CPC) in consultation with EIA Lead expert is conducting an Environmental Social Impact Assessment_(ESIA) for the proposed site.

The main objective of the **ESIA** study is to identify key environmental, health, social and economic issues associated with the proposed project and establish appropriate mitigation measures for the negative impacts while enhancing the positive impacts.

Public Participation of interested and affected parties in the **ESIA** is a requirement of the Environmental Management and Coordination Act, 1999.

In public and partnership participation, you have been identified as one of key informant. You are requested to document your views, opinions and concerns regarding the proposed irrigation project

This questionnaire acts as a guide for the respondent to provide relevant information on the proposed project. All the information obtained shall be used entirely for the proposed study on the project and shall be treated confidential.

We appreciate your cooperation and thank you for your willingness to participate in this exercise.

Please return the completed questionnaire to the ESIA/EA lead Expert.

Fredrick Aloo

Phone numbers: -

+254-726-589 117

E-mail address: -

fredrick.aloo@gmail.com

Address: -

P.O. BOX 34188-00100

NAIROBI – Kenya

Annex 6: Sample Questionnaire Filled by Respondent

PROJECT: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR PROPOSED REHABILITATION AND EXPANSION OF ONG'IYO (KOGOLA) WATER PAN IN AKOKO VILLAGE, WEST MIGWENA SUBLOCATION, SOUTH SAKWA WARD BONDO SUBCOUNTY, SIAYA COUNTY

The Ministry of Agriculture, Livestock, Fisheries and Cooperatives (MOAL, F&C), the state department of Crops through World Bank Funded Kenya Climate Smart Agriculture Project (KCSAP), intend to support the proponent Owaka Self Help Group to rehabilitate and expand Ong'iyu (Kogola) water pan. The project is meant to, provide water for tree nurseries, domestic and livestock use to the community. The project will involve excavation, embankment, draw off pipes and fencing. In a bid to ensure safe and sustainable environment, the National Environmental Management Authority (NEMA) under EMCA (Amendment) of 2015 Section 58 requires that an Environmental Impact Assessment is done and public participation be undertaken to establish the views and concerns of the interested and/or affected stakeholders. Thus as a member of the local community/group/institution within/around the proposed project area we kindly request for your comments on the expected socio-economic and environmental impacts of the proposed project.

Your response will be treated with utmost confidentiality

Section A

Response details

Name

AMBASO ELWAKIM

Institution/Organization

DEPARTMENT OF AGRIC
C G S

Telephone

0722 495003

1. Gender

Male

Female

2. Age of the Respondent.....42.....

3. For how long have you resided or worked in this area.....5.....(years)

Section B

Human Natural Environmental Concerns

1 Are you aware of the proposed rehabilitation and expansion

Yes

No

2 Do you think the proposed rehabilitation and expansion of the pan and its activities pose any danger to the environment

Yes

No

If yes explain N/A

3 Do you have any rejection/reservation on proposed rehabilitation and expansion of the pan

Yes No

If yes explain N/A

4 What do you think are the positive and negative socio economic and environmental impacts on the proposed project

Positive	Negative
<ul style="list-style-type: none">- ready availability of water- reduced time used for fetching water.- reduced time taken to water livestock- Available water for Small scale Irrigation- Water for raising tree seedlings- Reduced incidences of Human diseases (waterborne)- Improved living standards- Micro climate around the area (cool)	<ul style="list-style-type: none">- possible soil erosion- incidence of waterborne diseases- increased cases of malaria

5 Suggest mitigation measure for any negative impact that may result from implementing the project - Catchment protection, tree planting.

Also mosquito nets, water treatment tablets

6 a) Do you anticipate any conflict or complain against water pan project with respect

to: None

- Land Yes No
If yes indicate
- Water Yes No
If yes indicate Disagreement over utilization between domestic, animal & Agricultural.
- Public health and safety? Yes No
If yes indicate
- Loss of livelihood? Yes No
If yes indicate
- Cultural/heritage? Yes No
If yes indicate N/A
Others

(b) If any in 6(a) above what are the mechanism to put in place to resolve the conflicts/complaints amicably

- i. Training of community members on water resource utilization
- ii. Training of community members on Catchment protection

7 On the whole, would you have any objections to the project being implemented? None

- 8 In which category do you fall? (tick where applicable: you can tick more than one box)
- Neighbour resident Project official Stakeholder
- Stakeholder Community leader/Member
- Other Specify

PERSONAL INFORMATION

Signature: [Signature]

Thank you for your cooperation

[Please provide these details for the purpose of authentication in this EIA study only]

Annex 7: Photos On public consultation and filling of questionnaire



Plate 5: Community members filling questionnaire forms

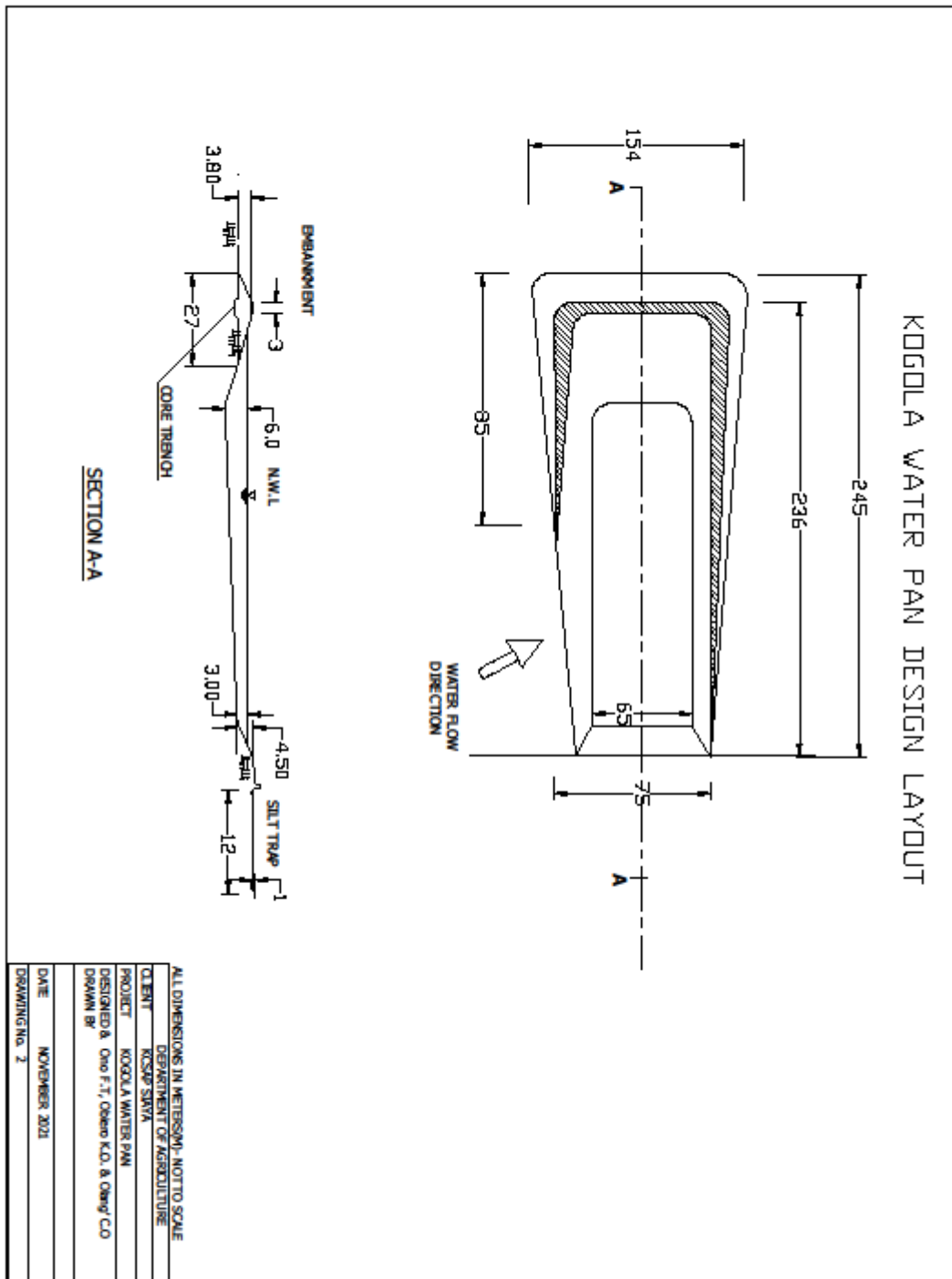
Community members and the lead expert visiting the proposed rehabilitation site



Participants raising their hands to show that they have accepted implementation of the project



Annex 8: Water pan Infrastructure Design and Layout



Annex 9: ESIA Certificate and Practicing License

FORM 7

(r.15(2))



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

License No : NEMA/EIA/ERPL/13629

Application Reference No: NEMA/EIA/EL/18097

M/S **FREDRICK ONYANGO ALOO**
(individual or firm) of address

P.O. Box 34188-00100, Nairobi

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **9049**

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

Issued Date: 1/5/2021

Expiry Date: 12/31/2021


Signature.....
(Seal)
Director General
The National Environment Management
Authority



Annex 10: Letter from NLC County Coordinator to Confirm that the Public Land is set aside for the



**COUNTY PROJECT COORDINATOR
SIAYA**
06 JAN 2022
RECEIVED
**KENYA CLIMATE SMART
AGRICULTURE PROJECT**

OFFICE OF THE COUNTY COORDINATOR
Ardhi House, 1st Floor
P.O. Box 803- 4060
Siaya

Tel: 0726881557
Ref: NLC /CC/SYA/GEN/VOL1 (54)

6th January, 2022

The County Project Coordinator,
Kenya Climate Smart Agriculture Project
Siaya County.

RE: CONFIRMATION OF PARCELS OF LAND AS PUBLIC LAND

Reference is made to your letter Ref: KCSAP/SYA/SUB-PJJ/VOL1 (140) dated 5th January, 2022.

This serves to confirm that the parcels of land listed below are public land.

S/ NO	Parcel Number	Reservation	Proprietor
1.	Siaya /Kobong/3077	Panyago Dam	Siaya County Council
2.	South Sakwa/Migwena /633	Ongiyo Dam	Siaya County Council
3.	Uyoma/Katwenga/595	Tinga Dam	Siaya County Council
4.	North Sakwa/Ajigo/272	Nyadong Water Point	Siaya County Council
5.	Uyoma/ Katwenga/373	Achar Pond	Siaya County Council

Kind regards,

Nobert Wangalwa
County Coordinator

Annex 11: Kogola Water Pan NEMA License

