

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

**FOR PROPOSED REHABILITATION AND EXPANSION OF PANYAKO WATER
PAN IN WEST UYOMA WARD, RARIEDA SUB-COUNTY IN SIAYA COUNTY**

GPS LOCATION: Latitude -0.24842, Longitude 34.324376



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NOVEMBER, 2021

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Certification by Proponent (client)

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SIAYA

The County Project Coordinator, Kenya Climate Smart Agriculture Project (KCSAP), 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



Signed by: - Willis Atiang

Institution: - County Project Coordinator (CPC)

Date: - 20th November, 2021

Certification by ESIA & EA Lead Expert and Team

Fredrick Onyango Aloo ESIA lead expert registered and licensed by the National Environment Management Authority (License No. 9049) and also a member 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 Panyako water pan in Akele/ Papkoderi Village in West Uyoma Ward, Rarieda Sub-County In Siaya County 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 (Amendment 2015 and 2019 respectively).

Signed by the ESIA/EA LEAD EXPERT (Reg.No9049)

Name: - Fredrick Onyango Aloo

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Date: - 20th November , 2021

ACKNOWLEDGEMENT

The team of experts involved in this work would like to sincerely thank the County Project Coordinating Unit (CPCU) for the Kenya Climate Smart Agriculture Project (KCSAP) for according us the honor to participate in this exercise and for availing the required documents as well as organizing and participating in the public engagement fora. In this regard, we want to specifically appreciate Willis Atiang', The Coordinator KCSAP, Siaya County and Mr. Benard Ayagah, The County Environment and Social Safeguard Officer, KCSAP.

We sincerely thank the project engineer Mr. Onno'a for taking his time to highlight the project in details including proposed project designs. We also want to sincerely appreciate the National Project Coordinating Unit (NPCU) led by Dr. Muthee for guiding and facilitating the process.

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

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

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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

EXECUTIVE SUMMARY

The proposed Panyako water pan is located Akele/ Papkodero Village in West Uyoma Ward, Rarieda Sub-County in Siaya County at GPS Latitude -0.24842, Longitude 34.324376. The community proposed the water pan which is approximately 42,000m³ in an area covering 0.40ha. The pan will be providing water for domestic use, livestock watering, fodder for livestock, crop production and fish farming. The main objective of the proposed project is to increase agricultural production for food and nutritional security, income generation and as an intervention to empower communities to build resilience against the challenges of climate change.

The proposed Project will be implemented through the Kenya Climate Smart Agriculture Project (KCSAP), a Kenya Government initiative funded by the World Bank whose development objectives is increasing productivity and incomes, enhancing resilience to climate change and reduction of Green House Gases(GHGs).

The specific proposed interventions for the project include: Fencing, construction of the livestock water trough, rehabilitation of the pan, construction of water kiosk, community latrine and bathrooms, horticulture Production and Aquaculture (Stocking of fish and husbandry practices). Establishment of tree nursery (seedlings and shade), catchment protection (seedlings and conservation structure establishment) and capacity building (CTDs, of stakeholders) washrooms installation of solar panels and water pump.

The Environmental and Social Impact Assessment (ESIA) Summary Project Report (SPR) has been conducted in compliance with the Environmental regulations, the EMCA, 1999 (Amendment 2015) and its subsequent supplements regulating major developments including the World Bank Environmental and Social Safeguard Policies. Among the legislation reviewed included The Constitution of Kenya, 2010; the Environmental Management and Coordination Act, 1999 (Amendment 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 SPR process involved literature reviews relating to the project, baseline studies of the proposed project area, reviews of relevant legal, institutional, regulatory and policy framework, public consultations and stakeholder engagements through public meetings, focused group discussions and key informants' interviews as well as house hold interviews.

The total number of participants during the public participation meeting conducted on 11th November, 2021 were 50 people. During the public participation meeting, data was also collected using structured questionnaires. A total of 20 questionnaires were distributed out of which 15 questionnaires were filled and returned. Additionally, 10 stakeholders were consulted to obtain more information on the proposed project. The main issues raised during the public participation and stakeholders' consultation include project sustainability, catchment conservation, and equitable sharing of water to proposed farms, households and livestock use. To address these issues the following measures were proposed are: water users paying water user fee to the Project Management Committee (PMC), planting of trees in the water catchment areas, training of PMC on leadership and governance and construction of water troughs for livestock.

The potential positive impacts identified included: creation of employment opportunities, improved nutrition, increased household incomes, improved environment due to planting of trees and increased quality of life. The anticipated negative impacts included loss of

biodiversity, increase in diseases incidences such as malaria, soil erosion, pollution of the water, gender based violence, sexual exploitation and abuse and occupational and safety hazards. Appropriate mitigation measures have been provided in the Environmental and Social Management and Monitoring Plan (ESMMP). The main mitigation measure includes planting of trees, control of soil erosion, provision of mosquito nets and water treatment tablets, safe use of biodegradable chemicals, capacity building of the beneficiaries on gender, HIV, COVID-19 and climate smart technologies, use of recommended machinery was suggested to reduce soil compaction among others.

The County Project Management Unit through the County Environmental and Social Safeguard Officer (CESSCO) will follow up and monitor the implementation of the ESMMP. The Contractor, PMC, supervising engineer and the community will be required to ensure the implementation of the proposed mitigation measures. The estimated cost of implementation of the ESMMP is Kenya shillings 1,380,000. The total cost of the project without the cost of ESMMP is Ksh. 33,298,000. The client is expected to share the ESMMP with the contractor who then is expected to prepare and implement a contractor-specific ESMMP.

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

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

CHAPTER ONE: INTRODUCTION

1.0 Introduction

The Kobong Community water conservancy-Panyako is a field based, not-for-profit water conservation project based within the Kobong community, with an intention to lift the community out of poverty through agriculture specifically horticulture and livestock farming, aquaculture and promoting community engagement in conservation. Kobong welfare have engaged with the community from 20 villages namely Gwena South, Gwena North, Rachar, Kobiero North, Kobiero South, Langu, Nyabeda West, Nyabeda East, Arongo, Owimbi, Gagra West, Gagra West, Langi North, Langi South, Akele North Akele South, Apondo North, Apondo South, Pala Buru, Pala Abuor villages with the long-term goal of establishing a self-governing community-led water conservancy whereby the Kobong welfare acts as a catalyst and steward for its development. During community meetings, many needs were identified. However, it became apparent that without a reliable, clean water source, none of them could be reached. Availability of water was viewed as a catalyst for agricultural production, which would form a foundation to economy of this community. Kobong welfare is now taking an exclusive focus towards increasing water supply, availability and accessibility. The proposed water pan will also provide water for horticultural production, livestock, fish farming and domestic use. This would result in increased crop productivity, increased incomes and food and nutrition security. The overall objectives would include improved community livelihoods and environmental protection which is in line with the core objectives of KCSAP

1.1 Justification of the project

Over the years, this community has struggled to make a living through farming their land. However, due to the nature of semi-arid climate, the community efforts to undertake small-scale agriculture is hardly any productive. On the other side, heavy rains during certain periods of the year results in massive erosion of the top-fertile soil into the Mawira river leaving the top soils poorer with low amount nutrients. This poor farming environment has led to food and malnutrition insecurity. Lack of water in the area compounds both the issues of lack of sustainable agriculture and livestock farming, it also has an impact on sanitation. Poor sanitation and malnutrition all lead to healthcare needs, which cannot be adequately provided.

1.2 Justification for conducting SPR

The CPCU, KCSAP Siaya contracted Peak Consultants to undertake an Environmental and Social Impact Assessment and prepare a Summary Project Report (SPR) based on the recommendation of the County Director of Environment, Siaya. This followed screening using the Environmental and Social Safeguards Checklist (*Annex 1*). The SPR was conducted in compliance with the Environmental regulations, the EMCA, 1999 (Amendment 2015) and its subsequent supplements; the Environmental (Impact Assessment and Audit) Regulation, 2003 (Amendment 2019); EMCA (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006; the Land Acts, the Water Act 2002 and the Irrigation Act among other pertinent legal and institutional frameworks regulating major development including the World Bank Environmental and Social Safeguard Policies. O.P 4.01 Environmental assessments (EA) of projects proposed, and OP 4.11 Physical Cultural Resources. All environmental and social issues related to the proposed project have been considered. The main objective of this report is to ensure that all the potential Environmental and Social Impacts have been identified and appropriate mitigation measures proposed for adoption during project's cycle.

1.3 Objective of the Summary Project Report

The objective of this study was to undertake a SPR of the proposed rehabilitation and expansion of Panyako water pan to establish potential impacts of the project's activities on the

environment including social concerns and to identify mitigation measures.

The specific objectives include: -

- To comply with EMCA 1999 (Amendment 2015) and World Bank Safeguard Policies
- To establish the baseline status of the proposed project site
- To identify the impacts of the proposed project's activities on the environment and social aspects
- To propose mitigation measures for the significant negative environmental and social impacts
- To develop an Environmental and Social Management and Monitoring Plan (ESMMP)

1.4 SPR Approach and Methodology

1.4.1 Overview

This study adopted an integrated approach which included desk review, field investigations, consultations among experts, interviews and discussions with stakeholders and affected parties. Desk review entailed review of literature of the existing documents regulations and guidelines such as Environmental Management and Co-ordination Act (EMCA) (Amendment 2015) as well as other related statutes and international codes on water use. Reconnaissance surveys including field visits were undertaken for physical evaluation of site of interest including intake, farms and general catchment area. The specific focus was on the biophysical and socio-economic environments. The sensitive environmental receptors, biodiversity, land use and development trends, physiographical features and climatic conditions along the project route were evaluated and analyzed. Public participation meetings and consultative meetings at the administrative and community levels were held to collect information on the beneficiaries' perceptions on biophysical and socio-economic impacts of project implementation.

The data collected focused on the following:

- ✓ Baseline data which included; biodiversity, socio-economic and environmental factors
- ✓ Legal policies, Legislative and Institutional Framework governing the proposed project
- ✓ Perception of the proposed project from the local communities
- ✓ Compatibility of the proposed project with the environment
- ✓ Types of waste to be generated, proposed management and disposal methods
- ✓ Potential positive and negative impacts of the project

The study assessed the possible impacts of the proposed project to the environment, residents in general and other administrative areas that share resources with the project beneficiaries.

1.4.2 Site visits

Information gathering was conducted through two site visits to the project, one transect walk and interview with the key informants of the project which included the area chief, assistant chief, project management committee and opinion leaders. A transect walk was carried out during the field visit to quantify the perceived impacts of project on land use, land conflicts and ownership, existing institutions in the area, vegetation cover and ecologically sensitive areas such as underground and surface waters; The information gathered also included the existing strategies towards environmental protection.

1.4.3 Public Participation and Stakeholder Consultation

One public participation meetings were conducted on 11th November 2021, in full adherence to the government directive on the COVID-19 pandemic - social distancing, wearing of face masks, use of sanitizers and limiting the number of contact hours. The participants during the public consultation are attached together in this report (*Annex 2*). Focused group discussions were also conducted during the public participation targeting the youth, the women and

differently abled persons. A total of 8 stakeholders including county officials in the Departments of Agriculture and irrigation, Department of Water, Department of Livestock, Department of Public Health and Sanitation and local administrations (area chief and ward administrator). Detailed outcome of the public participation and stakeholder consultation is presented in chapter five of this ESIA project report.

1.5 Structure of the report

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

CHAPTER TWO: NATURE OF THE PROJECT

2.0 Introduction

Kenyan government is implementing Kenya Climate Smart Agriculture project. The project promotes Climate Smart Agriculture through Technological Innovation Management Practices (TIMPs). Expansion and rehabilitation of Panyako water pan is one of the identified sub-projects in Siaya County for implementation.

The major activities of the project will include:

- ✓ Opening up and improving access road to the pan
- ✓ Construction of water pan
- ✓ Construction of Silt-trap/ check dam
- ✓ Fencing of the pan and constructing gates of entry to the pan
- ✓ Construction of community/domestic water points
- ✓ Construction of a livestock water trough
- ✓ Construction of washrooms
- ✓ Installation of solar panels and plastic water tanks
- ✓ Establishment of tree nurseries
- ✓ Promotion of agro-forestry
- ✓ Installation of one outlet piping system

2.1 Project Activities for the proposed Project

a) Preliminary activities

These include activities conducted before the actual works for the proposed project commences.

b) Initial Site Meeting

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

c) Mobilization of plants and machinery

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

d) Erection of Signboard

This will involve putting up a signboard for the proposed project with all the necessary information as prescribed in the contract. This will go a long way to increase project visibility and disclosure of the project to the public.

2.2 Construction works

This will involve fencing off the site, an area of about 0.40 ha. There will be clearing of selected vegetation, excavation and strengthening of embankments using a roller. Construction of silt traps, connection of outlets to draw water from the pan and check dams. There will be installation of solar panels, construction of bathrooms, livestock watering troughs and domestic water collection sites

2.3 Materials and Equipment

• Materials

The materials required for the proposed project include cement, sand, stones, ballast and timber for slab support, fencing barbed wires of gauge 30, binding wire, chain links and concrete poles will be required to fence the demarcated sites of the pan.

- **Equipment**

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

2.4 Design

The siting, design concept and criteria for the proposed project 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 (*Annex 4*).

2.5 Topography of the pan

The average slope of the site is 2.0%, towards one direction to the pan area and downstream into river Mawira

2.6 Pans Catchment Area

The water catchment of the water pan spans over 10 Kms²

2.7 Design Calculations

2.7.1 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.

Drawings useful to prepare for the construction of the water pan will be:

- A plan of the pan wall and spillway.
- A cross section of the pan wall and
- A profile of the pan site (longitudinal drawing of the pan wall including key and crest)

2.7.2 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 0.8km² from Google earth.

2.7.3 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 on Kenya Population and Housing Census 2019. As per 2019 population census, the growth rate for Rarieda Sub County was 2.6% per annum. Therefore, the 2.6% rate will be used in projecting the population.
Number of households = 1362

Average number of persons per household =4
 Total number of persons = 5448
 School going children (42%) = 2288
 Adults 58% = 3160
 Percentage of Households with Livestock = 43%
 =586 H/Holds
 Average number of cattle +donkeys per household = 3
 Total number of cattle + donkeys = 1758
 Average number of shoats per household = 4
 Total number of shoats =**2344**

Present period – year 2021
 Initial period – year 2025
 Future period – year 2035
 Ultimate period – year 2045

2.7.4 Human Projection

Table 1: Human projection

	2019	Present 2021	Initial 2025	Future 2035	Ultimate 2045
primary school Pupils	2288	2347	2958	3727	4696
Adults	3160	3242	4085	5147	6486

2.7.5 Livestock projection

Table 2: Livestock projection

Type	2019	Present 2021	Initial 2025	Future 2035	Ultimate 2045
Cattle and donkeys	1758	1804	2273	2864	3608
goats /sheep	2344	2405	3030	3818	4811

2.7.6 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	11.44	11.74	14.8	18.6	23.5
People	15L/h/day	47.4	48.6	61.28	77.21	97.28
Cattle	20L/h/day	35.2	36.07	45.45	57.27	72.2
Shoats	5L/h/day	11.72	12.02	15.15	19.09	24.05
Total						217

With ultimate water demand of $217\text{m}^3/\text{day}$ this translates to $217\text{m}^3/\text{day}$
 $*30\text{days}*5\text{months}=32550\text{m}^3$ for the dry period.

- Evaporation of the area is $5\text{mm}/\text{day}$ and the longest dry period experienced has been for 5 months information obtained from locals, this totals to a loss of $5\text{mm}/\text{day}*5\text{months}*30\text{days} = 750\text{mm}$ using surface area of the pan at full water level is $8000\text{m}^2 * 0.75\text{m} = 6103\text{m}^3$ as evaporation loss
- Dead storage is not very significant in water pans but take 10% of pan capacity i.e., 3255m^3

Total water demand is 41908m^3 . There is need to design for $42,000\text{m}^3$.

2.8 Project Output

The project outputs will include increased water availability to meet the demand for domestic, livestock and irrigation. Other outputs are increased agricultural productivity and farm incomes from farming activities that will accrue from the agricultural value chain. There will be increased agricultural knowledge and skills, environmental conservation, project sustainability due to trainings that will be conducted to the project beneficiaries and project management committee.

2.9 Project Cost

The estimated costs of Panyako water pan project including implementation of ESMMP is Kenya shillings **33,298,000**

CHAPTER THREE: LOCATION OF THE PROJECT

3.0 Introduction

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

3.1 Project location

The proposed site is located in Kobong Sub-Loaction, West Uyoma Ward, Rarieda Sub-County of Siaya County. The pan is strategically located at Kobong village along Ndori Luanda Kotieno tarmac road, off Gagra madiany murram road at papkodero the site is approximately 2 kilometres from the road. The project when fully operational will serve 20 villages namely Gwena South, Gwena North, Rachar, Kobiero North, Kobiero South, Langu, Nyabeda West, Nyabeda East, Arongo, Owimbi, Gagra West, Gagra West, Langi North, Langi South, Akele North, Akele South, Apondo North, Apondo South, Pala Buru, Pala Abuor in West Uyoma Ward covering a total population of about 14,000 persons. The project location is presented Figure 1



Figure 1: Google earth map indicating the site of proposed Panyako water pan

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, beans, water melons. It is also suitable for cereal crops including maize, green grains and peas.

3.2 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.

3.3 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*, *Acacia Xanthophloea*, *Balanitis aegyptiaca*, *Markhamia lutea*, Shrubs of lantana Camara. The common grass is *Cynodon placteostchys*. The economic importance of trees is soil conservation, provision of firewood and timber

3.4 Demographic attributes

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

Number of households = 1362

Average number of persons per household =4

Total number of persons = **5448**

School going children (42%) = 2288

Adults 58% = **3160**

3.5 Infrastructural access

The proposed project site is accessible through Ndori, Luanda Kotieno tarmac road off Gagra Madiany murrum road about 2km from the road. The Location has electricity supply and is connected to the national grid the nearest transformer is about 600meters from the site. However, the main source of energy for cooking is fire wood. There is low utilization of other sources of energy like Liquefied petroleum gas (LPG), fuel, solar and wind. Telecommunication network is good. Housing and shelter is 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 include Gagra, Rachar Pala kobong, Lango, komolo primary schools and The Secondary Schooln are Gagra, St Antony, Rachar primary. The nearest health facility is at Papkodero dispensary.

3.6 Land Ownership

Land in the County is categorized as per the Article 61 of Kenya's Constitution, Land Act, 2012 and Community Land Act, 2016. The first category of land that constitutes bulk of the land parcels is private land. The community land is further categorized as registered community land and unregistered community. The second category is the public land which are mostly land owned by National or County Governments, public institutions and they include road reserves, riparian, ridges, lakes and forests. The land for the proposed Panyako water pan in West Uyoma ward is under the defunct county council of Siaya and currently under the trustee of County Government of Siaya. The site is a pre-existing site set aside for water pan construction and has the blessing of the county administration. The land is public land parcel Title Deed Number Siaya/ Kobong/ 3077 Sheet Number 23 (Annex 3).

3.7 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 Madiany, Ndori, Aram and Bondo

3.8 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.

3.9 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.

CHAPTER FOUR: PUBLIC CONSULTATIVE PROCESS AND DISCLOSURE

4.0 Introduction

The Kenyan government has enshrined the need for human societies' involvement in project development in the Constitution of Kenya 2010. This has been set out in the EMCA, 1999 and Environmental (Impact and Audit) Regulations, 2003 and subsequent amendments (2015 & 2019). The proposed project has incorporated public consultations in order to understand the local impacts, needs and wishes of the community and eventually incorporate them into the final designs and operations of the project.

4.1 Objectives of the Public Consultations/meetings

The key objectives of the consultation and public participation for proposed rehabilitation of the Panyako water pan was to:

- Disseminate and inform the public and stakeholders about the project with special reference to its key components and description
- Create awareness among the public on the need for the ESIA for the proposed project
- Gather comments, suggestions and concerns of the interested and affected parties
- Incorporate the information collected in the ESIA
- Build community consensus and acceptance of the proposed project.

4.2 Stakeholders identification

During the SPR exercise, relevant stakeholders were identified. Each stakeholder was consulted on specific aspects of the projects ranging from the design, views on benefits, likely negative impacts and involvement at all stages of implementation. A total of 15 stakeholders were consulted and their views, issues and suggestions were documented. (*See Annex 3*)

4.3 Methodology of Public Participation and Stakeholder Consultations

The first stake holders' participation was held on 11th November, 2021 to gather information on environmental, social and economic issues relating to the project through focused group discussions. A simple household questionnaire was used to collect information from the public. Key informant interviews and focused group discussions were also used.

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

During public consultations, members of the community mainly concentrated on the direct benefits of the pan including, availability of water for livestock, irrigation and domestic use. Other positive impacts raised included reduction in poverty levels of many households as a result of increased incomes from sale of farm produce, creation of employment opportunities in form of farm labor and related input and output activities, diversification of farm enterprise leading to improved nutrition, reduction of labor and cost of irrigated farming which currently uses fuel generated pumps to abstract water from the pan to the farms.

Positive social issues raised were: reduction of idleness amongst the youth due to an increase in income generating activities either directly or indirectly, Incidences of abuse of drugs due to idleness will decline.

The community did not dwell much on negative impacts but the consultant's team assessed the site and came up with possible negative impacts arising from the project.

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

- **Employment opportunities**

The respondents consulted indicated that the project will create employment opportunities during the project cycle from construction to operation and the staff that will be involved in the daily cores within the project after its completion such as guards, planting trees pasture seed collection.

- **Land use and management in the area.** The public were notified that the adjacent areas will be under irrigation for crops and pasture for livestock. The public suggested that agroforestry be established in the farms and the trees be conserved within and around the pan area. This concern will be addressed during land clearing and during soil and water conservation trainings by the agriculture staff as in ESMMP.
- **Socio-economic and environmental challenges in the area.** The socio-economic and environmental challenges during project implementation were raised by the public. The public were concerned about social issues like provision of labor and building materials during construction. The leaders from the area said there was need to inform the contractor to source materials and labor as much as possible. Also issue of reducing vegetation during land clearing. This issue has been addressed in the ESMMP on conservation of soil and environment. Also farmers will be leaving some leguminous (nitrogen fixing trees) in the site to conserve the environment.
- **Accidents during various phases of project activities** 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
- **Flora and fauna may be destroyed during construction.** The public expressed the need of minimizing clearing of trees. This issue will be addressed by the ESMMP on conservation of biodiversity.
- **Community Conflicts.** This concern was raised due to demand for domestic water use and irrigation. This concern will be addressed through project management committee and public meetings. It was also and including two water troughs as drinking points for livestock in the pan area. Indicate the proposed GRMs



Plate 1: West Uyoma ward Administrator talking to the participants



Plate 2: Participants raising their hands in acceptance of the project



Plate 3: Lead expert inspecting the site of the proposed water pan



Plate 4: Chairman of the proposed water pan addressing the participants



Plate 5: Participants filling the questionnaire on negative/positive impacts and proposed mitigation measures

CHAPTER FIVE: ANTICIPATED IMPACTS AND PROPOSED MITIGATION MEASURES

5.0 Introduction

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

5.1 Anticipated Impacts during Construction Phase

5.1.1 Positive Impacts during Construction

- **Employment Opportunities:** There is anticipated increase in job opportunities through; recruitment of unskilled and skilled labor from the locals, service provision to the construction workers in terms of meeting their food, accommodation and transport requirements.
- **Improved Infrastructure:** The access roads that will be improved to enable the heavy machineries to reach the proposed site.
- **Increased Incomes:** The construction works will provide a market for the locally available materials while the services required by the construction workers will boost the local businesses.

5.1.2 Anticipated Negative Impacts and Mitigation measures during Construction phase

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

1. Vegetation and wild life Loss

There is anticipated increase in clearing of vegetation to expand the pan, leading to loss of biodiversity of flora and fauna. The area is also a home to many bird species that may migrate as well indigenous trees that have cultural and medicinal values to the local community.

Mitigation Measures

Limited clearing of vegetation and avoidance of construction within key ecologically sensitive habitats. Wherever clearing occurs the land should be landscaped and indigenous trees be planted to restore the lost biodiversity.

2. Soil Erosion

An increase in soil erosion may result from loosening of the soil during construction works and vegetation clearing. In addition, some of the loose soils accumulated in the area will be swept away by winds and rainwater leading to siltation and affecting the aquatic life.

Mitigation Measures

- Soil erosion control and conservation measures will be undertaken to avoid erosion in sensitive and stockpiled areas
- The topsoil black cotton should not be utilized during the construction activities
- Rehabilitation of degraded environment should be undertaken to stabilize the soil and therefore reduce rate of soil erosion and siltation.

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- The excavation works should be compacted and the embankment be strengthened

3. Soil Compaction

The high traffic especially of machineries and the construction workforce within the project area is likely to lead to compaction of the soil structure further leading to reduced capacity of the water to infiltrate into the soil thereby affecting the soil-water balance and the hydrological cycle largely.

Mitigation Measures

- Machines need to be operated on the existing roads or tracks as much as possible
- Unnecessary vehicle movement should be avoided
- Compaction during stockpiling should be avoided by working the soil in its dry state
- Re-vegetation should be enhanced to reduce run off

4. Dust and Noise pollution

There is meant to be an increased traffic flow into the project area to include heavy, light and fast vehicles ferrying construction materials. The access roads that are largely earthen roads could result in increased dust and consequent increased traffic especially at the daily onset and offset of the construction works. This is likely to affect the health of the residents and the aesthetic value of the areas.

Mitigation Measures

- The contractor should ensure there is regular watering of dusty roads and maintenance during this stage,
- Damaged roads as a result of heavy vehicles should be repaired adequately and without delay
- After the construction works, the temporary access roads should be rehabilitated to their former state

5. Pollution; Air Quality and Noise Concerns

The construction activities mostly the excavation will generate a significant amount of dust which may be blown by the wind and construction vehicles. Construction vehicles and other plant on site may generate a lot of smoke from the diesel engines leading to air pollution. When the fumes are inhaled in considerable amounts just like the dust it could lead to adverse effects on the respiratory system especially to young children. Noise pollution emanating from construction vehicles, other machinery and workers will have a great significant negative impact to livestock, and wild animals.

Mitigation Measures

- The vehicles transporting raw materials especially soil should be well covered to reduce dust emissions
- Requisite PPEs such as dust masks should be provided to the workers on dust prone areas
- The speed of the construction machineries should be controlled and other vehicles
- The removal of vegetation should be avoided with the exposed surfaces being adequately re-vegetated
- Installation and maintaining appropriate silencers on noisy machineries
- There should be appropriate selection of construction machinery

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- Sprinkling of water in construction yards, road and soil heaps to keep down the dust produced.
 - Construction to take the shortest time possible, in addition, the activities generating dust should be carried out in calm weather.
 - The noise levels should be kept at the minimum acceptable levels and the construction activities be confined to the normal 8 am to 5pm working hours

6. Extraction of Construction Materials

There is a heavy demand for construction materials in bulk such as sand, gravel and rocks. These will be extracted from the local sources. The extraction and transport of these materials is likely to result in the distortion of the ground structure, vegetation loss, dust emission, oil spills, noise and potential for accidents. Further, the barrow pits associated with extraction of materials may result to water that will become suitable breeding grounds for mosquitoes and other diseases vectors, leading to increase of water borne diseases.

Mitigation Measures

- The materials should be sourced from an approved site
- There should be adequate re-use of the excavated waste materials
- The proposed site for barrow pits/rehabilitation plans should be indicated in the construction plan and approved by the local authorities as well as done appropriately to minimize impacts on various land uses.
- There should be adequate landscaping, backfilling and draining of the depressed areas to prevent breeding grounds for disease vectors

7. Solid wastes

The solid wastes are likely to arise from soil excavated and rock debris, metal cut offs and plastics, cardboards, paper, wood and waste concrete among several others. The effects of improperly managed wastes could be far reaching and may result in pollution of the water pan, nuisance to the local communities, and increased vermin among other undesirable effects.

Mitigation Measures

- The contractor should promote the reuse, recycling and reduction of wastes
- There should be adequate litter collection facilities
- Waste disposal should be in locations approved by NEMA in accordance with the waste management regulations
- The chemical and hazardous wastes should to be disposed in dug pits.

8. Liquid Wastes

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

Mitigation Measures

- The grey water runoff from the working areas should be contained and properly channeled and be reused.
- Water containing pollutants such as cement, concrete, lime, chemicals and fuels should be discharged into a conservancy tank for removal from the site
- Potential pollutants should be stored, kept and used in such a manner that any escape can be contained to avoid degrading the water table
- Any pollution incidents on site should be resolved immediately

- The maintenance of vehicles and other machineries should be on designated locations where potential pollution is unlikely such as on concrete platforms
- There should be regular maintenance of machineries to ensure they are in good working conditions and are free from oil leakages
- There should be fast oil spill containment and clean-up of equipment at the requisite places

There should be adequate operator training to adopt measures that are preventive in use of such machineries

9. Occupational hazards and Health risks.

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

Mitigation Measures

- There should be a comprehensive Health and safety policy to safeguard the health of the workers
- There should be compliance to all health and safety standards in place
- All workers should be provided with full protective gear and there should be proper use of PPEs. These include working boots, overalls, helmets, goggles, earmuffs, dust masks, gloves among others to safeguard their safety
- There should be proper hoarding of the site to control movement of the public into the area
- The project site should be well sprinkled with water so as to reduce dust
- Establish an assembly area for all workers in case of an accident and maintain a record of all works at the site at each particular time. In addition, workers should be sensitized on construction safety measures
- Equipped first aid kits should be provided at the site and first aid training given to the supervisors for handling potential casualties
- The contractor should have workmen's compensation cover to avoid liability in cases of serious accidents
- Clean sanitary facilities and clean drinking water should be provided at the site
- Lunch breaks shall be provided; food is set to be served at the site
- Warning signs should be erected to warn of construction activities and heavy machinery at site
- Risky areas such as deep pits should be covered or fenced off to avoid accidents

10. Gender Based Violence (GBV) and increased spread of STDS/HIV/ AIDs

Sexual relationships between community members and the construction workers may result to GBV and spread of STDS/HIV/AIDS in the area.

Mitigation Measures

- Awareness creation and sensitization of workers and the local communities on the associated dangers and preventive measures
- There should be provision of adequate prevention measures such as condoms
- Establishment of grievance redress mechanisms

11 Increased risk of spread of covid-19 pandemic.

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

Mitigation measures.

- Sensitizing the public on covid-19 government of Kenya regulations to reduce risk of the spread.

- Providing a container with a tap and running water and soap for public to wash their hands.
- Provide hand sanitizers in construction site for people to sanitizes their hands

12 Sexual Exploitation and Abuse (SEA)

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

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.

13. Child Abuse

Children within project areas 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 to Child Protection

- ✓ The contractor will develop and implement a Children Protection Strategy that will ensure minors are protected against negative impacts associated by the Project including on SEA...
- ✓ All staff must sign, committing themselves towards protecting children, a contract which clearly defines what is and is not acceptable behaviour
- ✓ Children under the age of 18 years should not be hired on site as provided by Child Rights Act (Amendment Bill) 2014.
- ✓ Wherever possible, ensure that another adult is present when working in the proximity of children.

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- ✓ Not invite unaccompanied children to workers' home, unless they are at immediate risk of injury or in physical danger.
 - ✓ Refrain from physical punishment or discipline of children).
 - ✓ Refrain from hiring children for domestic or other labor, 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 labor laws in relation to child labor specifically provisions of Kenya's Employment Act Cap 226 of 2007 Part VII on protection of children against exploitation

14. 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.

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

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 of hazardous chemicals that can find its way in the food chain.

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

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.

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.
- 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.

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 Kobong Community Water Conservancy Group 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. 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;
- 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;

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- 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.
- 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.

6.0 Responsibilities

The ESMMP has various components with the respective stakeholders involved towards the implementation of the corrective actions. Various persons and organizations are to be involved in the project. The following should be involved in the implementation of the ESMMP;

6.1 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. The monitoring guidelines are based on the following parameters:

- Improved vegetation cover
- Level of coli form and other bacteria in the sampled water not to forget the ppm solid elements in the pan
- Severity of catchment encroachment
- Public safety and health awareness
- Malaria and other social disease prevention and control systems in place
- Livestock – human conflicts management
- Safety of equipment and property
- Capacity building and skills improvement of water users
- Maintenance of infrastructure

6.2 Auditing the ESMMP

The proponent community based organization should conduct annual audits to ensure the systems are operating effectively. The audit needs to ensure that the auditing procedure is in place to ensure that: -

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

6.3 Design and Construction Phase

The necessary objectives activities, mitigation measures and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with construction phase of the proposed pan are outlined below:

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 ✓ Avoid cutting indigenous trees and vegetation within the survey area path of the water conveyance ✓ 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 	<ul style="list-style-type: none"> -Acreage of area demarcated and construction sites identified -Acreage area of indigenous trees secluded -% of vegetation cover -No. of trees within the project areas 	<ul style="list-style-type: none"> reports/photographs -Site plan showing demarcation 	Contractor Supervising Engineer	Throughout construction period	Contractor cost
Soil erosion	<ul style="list-style-type: none"> ✓ There should be erosion control measures on areas prone to erosion especially steep slopes by installing soil erosion control structures ✓ There should be intensive re-vegetation on bare grounds after construction ✓ Provide trees to farmers along slopes 	<ul style="list-style-type: none"> No. of soil conservation structures established Length of soil conservation structures 	- Soil and land management plan and Report	Contractor Supervising Engineer	Construction period	100,000
Air Pollution (dust)	<ul style="list-style-type: none"> ✓ The contractor to provide dust 	-No. of workers	-site visit /reports	Contractor	Construction	Constructor

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
exhaust	<ul style="list-style-type: none"> ✓ masks to workers ✓ The contractor to ensure sprinkling of water on the soil during excavation and land filling; ✓ The contractor to ensure that speed of working machinery is controlled 	<p>provided with dust mask</p> <ul style="list-style-type: none"> -No. of times water is sprinkled during excavation -No. of trainings conducted 	<p>Photographs</p> <p>-Sensitization report</p>	Supervising Engineer		cost
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 ✓ Regular servicing of equipment ✓ -Noise levels should be kept within acceptable limits 	<ul style="list-style-type: none"> - •No of cases reported on noise disturbance •No of PPEs distributed to workers on site •No of machines with noise insulators 	<p>Register</p> <p>Case Report</p> <p>Site Report</p>	Contractor Supervising Engineer	Construction Phase	Contractor cost
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>	Contractor Supervising Engineer	Construction phase	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 for re-fueling mobile 	No of Oil and grease traps established	Records Register on vehicle maintenance	Contractor Supervising Engineer	Construction phase	Contractor cost

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	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 at least 2 meters ✓ The team will be provided with appropriate PPE such as masks for them and for the 	<p>No of trainings and participants No of Training material, PPE, sanitizing facilities</p> <p>No. of participants registered online.</p> <p>No of recordings on of use of electronic media for information dissemination/engagement e.g. printed electronic mails, addresses of video links created etc.</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
	number of people they intend to meet; mainly in form of FGDs					

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 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 HIV/AIDS and STIs	<ul style="list-style-type: none"> ✓ Contractor(s) to sensitize workers and community members on HIV/AIDS awareness and other communicable diseases as part of the contractor's 	<p>Number of persons by gender sensitized</p> <p>Cartons of condoms distributed and to the relevant persons</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
	Health and Safety Management Plan ✓ Contractor(s) to provide standard quality condoms at the construction site during the construction period.	Number of sensitization workshops				

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
Child abuse	<ul style="list-style-type: none"> ✓ Comply with all relevant local legislation, including labour laws in relation to child labour ✓ Refrain from hiring children for domestic or other labour, which is inappropriate given their age, or developmental stage, 	Number and type of child abuse incidences reported	Reports Existing records at the Children centers	Contractor/Project Management Unit	Biannually	-N/A
Impacts related to 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 all the necessary 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 and sensitize them 	<p>Number of Fully equipped first Aid Kits available</p> <p>Number of reported accidents</p>	Reports	Contractor/Project Management Unit	Continuous	20,000
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 	<p>Number of reported cases on grievances</p> <p>Number of sensitization awareness creation workshops on GRM</p> <p>Number of community</p>	Reports Existing records	Contractor, Project Management Unit	Continuous	20,000

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	<ul style="list-style-type: none"> ✓ 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, 	members trained on GRM				
Destruction of cultural heritage sites	<ul style="list-style-type: none"> ✓ 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 	Affected cultural sites in the project area Number of mechanisms/meetings undertaken	Reports Photos Existing records at the county government office	in case of chance find the contractor will secure the area and notify the NMK and County Department of Culture National Museums of Kenya and County department of Cultural services Contractor	Construction period	-
Sub Total:	ESMMP Construction phase					530,000

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	-Sensitize farmers on sustainable agricultural practices, river bank conservation, agroforestry, soil conservation -Capacity building on integrated pest management dangers of contaminating the Soil with synthetic fertilizers -Regular water monitoring	No and types of conservation measures. -Trees plant along with crop -No of Framers practicing Integrated Pest Management - No of Regular pan water quality d	-Training reports/photographs -Field observations on number of trees planting along with crop production -Minutes of community meetings	Project Management Unit in collaboration with the CBO Sub County Agricultural office	Throughout operation period	100,000
Siltation	-Frequent removal of mud from the silt trap	- Silt levels in the silt trap	-Reports on status of silt in the pan	Project Management Unit in collaboration with the CBO Sub County Agricultural office	Throughout operation period	150,000
Solid Waste management	-Establish waste disposal site for hazardous waste in allocation approved by NEMA in accordance with waste management regulations --Designed waste collection points	-Number of Waste deposition points	Monitoring Reports	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 reduce soil displacement No of tree nurseries No of trees planted and grass cover	Report Field observation	Pan Management Unit	Operation period	40, 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	100,000
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 established responsible for	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	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	100,000
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	Sites cleared of health risk Report on activities adopted on integrated pest and diseases control Reports Field visits	Project management Committee Community members project implementation team	Operation period	20,000
✓ Covid 19	✓ 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. ✓ All workers and visitors accessing worksites every day or	No Availability of: SOP(s), No of Training material, PPE, Sanitizing facilities, Installed handwashing equipment	SOPs, Project assessment reports, Purchase orders/receipts, Photos	All the Project components	monthly	50,000

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	<p>attending meetings shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs.</p> <p>✓ The project shall put in place means to support rapid testing of suspected workers for covid-19.</p>					
✓	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>Warning signage</p> <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"> ○ The contractor 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 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- 	<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</p>	<p>SEA action plan</p> <p>Attendance registers</p>	<p>Contractor</p> <p>GBV Expert</p>	Continuous	50,000

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).	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	-
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	20,000
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 Management Unit County department of public	Continuous	20,000

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. ○ 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. 	<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	50,000
Total ESMMP Cost for Operational Phase						850,000
Grand Total cost of ESMMP						1,380,000

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
Spread of COVID-19 amongst workers	<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. 	Availability of: SOP(s), Training material, PPE, Sanitizing facilities, Installed handwashing	SOPs, Project assessment reports, Purchase orders/receipts, Photos	All the Project components Supervising Eng. & Contractor(s)	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 	equipment				
Total cost of decommissioning						155,000

CHAPTER SEVEN: CONCLUSIONS AND RECOMMENDATIONS

7.0 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

7.1 Conclusion

From the findings of the study that is detailed in this report, the Tinga Agege 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 Tinga 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

Third phase Sub Project Screening Checklist 2021

Section A: Background information

Name of County... MURGA.....

Name of CPCU/NEMA KI. RUMERIA..... AKITH.....

Sub-project Ward... WEST. WIDYA... WARD...

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

Contact Person... RAVY... DMUAD..... Cell phone... 0202 250 916.....

Sub-project name... ASHARI... CLUBA... S.E. RWYAKO... WATER PAN

Estimated cost (Ksh.) 9.7 M.....

Approximate size of land area available for the Sub-project... 0.40 Ha

Objectives of the Sub project.....

..... to water for domestic use, also for livestock.....

..... for irrigation, also for fish production.....

Activities/enterprises undertaken... irrigation... and... cotton... raising

How was the Sub-project chosen?... community.....

Expected Sub project duration... continuous.....

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?	✓	
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? Covid-19	✓	
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 sub-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?		✓

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:

Name: PAUL OMULO

Position / Community: CHAIRPERSON


Date: 05/05/2021

Field Appraisal Officer (CDE): William Odupe

Signature: [Signature]

Date: 5/5/21

Annex 2: Title Deed of the Land


REPUBLIC OF KENYA
THE LAND REGISTRATION ACT
(No. 3 of 2012, section 108)
THE REGISTERED LAND ACT
(Chapter 300) (REPEALED)

Title Deed


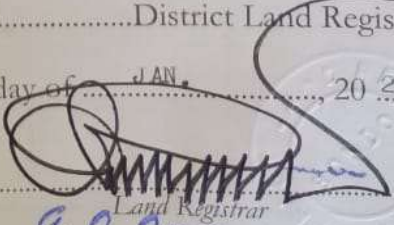
Title Number SIAA/KOBONG/3077
Approximate Area 0.40 ha
Registry Map Sheet No. 23

This is to certify that PANIAKO DAM, REG. NO. I/K/GU/SHG/159

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 28 of the Land Registration Act (No. 3 of 2012) as may for the time being subsist and affect the land.

GIVEN under my hand and the seal of the
.....BONDO.....District Land Registry

this 29th day of JAN. 20 21



.....
Land Registrar
G. O. Ongula *229

Annex 3: Minutes of the Community Consultation Meetings

MINUTES OF THE COMMUNITY BARAZA/MEETING FOR PROPOSED REHABILITATION AND EXPANSION OF PANYAKO WATER PAN IN KOBONG SUB-LOACTION, WEST UYOMA WARD, RARIEDA SUB-COUNTY OF SIAYA COUNTY. HELD ON 11th NOVEMBER, 2021 AT KOBONG VILLAGE AT 10.00 AM

Members Present:

List attached

Agenda

Project Brief

Community Sensitization on ESIA

Public participation

AOB

Min 1/ 11/11/2021: Introduction

The meeting commenced at 11a.m with a word of prayers from Madam Peninah Anyango The Chairman of Kobong Community Water Conservancy Group, who is also the chairman of the water pan welcomed the participants and informed the meeting that there is a serious water scarcity problem in the region. He welcomed the team from Kenya Climate Smart Agriculture Project (KCSAP) Siaya County office and the ESIA lead Experts from Nairobi. He did recognize the presence of KCSAP County Project Coordinator Siaya Mr Willis Atiang, The County Environmental Social Safeguards officer Mr Benard Ayagah and West Uyoma Ward Administrator Madam Victoria. They were all called upon to greet the participants.

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

The KCSAP County Project Coordinator for Siaya county welcomed the participants and promised to give them all the necessary facilitation to ensure that the pan is rehabilitated and become sustainably operationalized. He made reference to the screening exercise and Engineering designs which were undertaken at the community level by County National Environmental Management Authority (NEMA) and County Irrigation Engineer Mr Onno. He gave a brief highlight on the objective of the visit and the need to conduct an Environmental Social Impact Assessment on the proposed rehabilitation and expansion of Panyako water pan as per the requirement by the EMCA Act. The role of the community was emphasized and the participants especially the Project Management Committee were informed that they have to be responsible and able to operationalize the project. 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 3/25/11/2021: -Kenya Climate Smart Agriculture Project (KCSAP) County Environment and Social Safeguards officer (CESSCO) Mr Benard Ayagah

Reported that a screening checklist was undertaken to determine the nature of the project its impacts and whether it can be categorized as a Summary Project Report as per NEMA Legal Notice No 31 and 32. A brief highlight on activities that will be undertaken during the project cycle was presented. Among the activities were: Fencing and establishment of gates,

construction of community water points (Four in number) Construction of Wash room and toilet facilities (Two in number). Establishment of tree nursery and Aquaculture (stocking of fish), Catchment protection and conservation measures. Water pumping and reticulation Community Capacity building, provision assorted agricultural inputs / labour , undertake Clearing and paving access road by the community under community share contribution of the project and provision of Land. All the highlights have been elaborated in the project proposal and the costs of each and every item presented.

Min 3/ 11/11/2021Project Brief

The chairman Mr Paul Omulo from the community presented a brief history of the pan to the participants. Mr Ochola Mbika reported that the pan was first constructed in the 1950's. It located adjacent to River Mawira and serves Racher/Kobiero, Nyabele East and Pala Villages. It was active and used to sustain water throughout the year until sometime in 1989. Currently the pan is highly silted with the embankment totally collapsed. Evidently, it has outlived its lifespan.

Hence the need to rehabilitate and expand the pan. The participants were reminded that the pan must be able to sustain itself in terms of financial management.

Mrs Mary Awuor informed the participants that the pan must be fenced all round and only designated gates be established in order to prolong its lifespan. She noted that currently livestock drink water from all sides there is no control, community members collect water directly hence contaminating the water yet the same water is used in households for domestic chores. She clarified that there are so many unemployed youths in the village and the pan will create employment the youth can be engaged in running the day to day operations of the pan.

Min 4/ 11/11/2021 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 4/ 25/11/2021: 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:

Mr Austin Apamo Okelo informed the members that if the project will create impact by promoting irrigation of high value vegetables. It will also provide water for livestock and domestic use. 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

Min 5/11/11/2021: 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 incidences of soil erosion during construction works but upon operation conservation measures will be put in place by planting trees and grass along the embankments
- Establishment pan management committee to coordinate access and utilization of water facilities

Min 6/11/11/2021: 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. Attached in the Annex 2 is a certified land search document

CONSENT FOR THE PROJECT

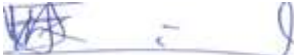
The Community members present agreed unanimously gave consent for the project.

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 11/11/2021

Fredrick Aloo Lead Expert
Taking Minutes

Annex 4: Attendance list













Kenya Climate Smart Agriculture Project (KCSAP)
Office of the CPCU - Siaya



REGISTRATION FORM

ACTIVITY: Public Participation at Panyiro WHTZ Pond DATE: 15/11/2011

NO	NAME	ORGANIZATION	DESIG	MOBILE	CONTACT	EMAIL	SIGN
1	Henry Odhiambo	MOA	Eng	0750120700	Henry.odhiambo@kenya.go.ke	Henry Odhiambo	
2	Frederick Audo	WMAFC	ADLP	0726589177	frederick.audo@wmafc.org	Frederick Audo	
3	George Ndung'u	WMAFC	POE	0720742844	george.ndungu@wmafc.org	George Ndung'u	
4	Grace Okumu	WMAFC	ADLP	0722168748	grace.okumu@wmafc.org	Grace Okumu	
5	Beth Ellyak Luvu	WMAFC	ADLP	0722147027	beth.ellyak@wmafc.org	Beth Ellyak Luvu	
6	Steven Otona	MOA	Eng	0339339303	steven.otona@kenya.go.ke	Steven Otona	
7	Stuart Muthi	NIB MHEPO	ADLP	0700253393	stuart.muthi@nibmhepo.org	Stuart Muthi	
8	Peter Lungu	WMAFC	Dr	0721545561	peter.lungu@wmafc.org	Peter Lungu	
9	Miriam Onato	WMAFC	Dr	0117087141	miriam.onato@wmafc.org	Miriam Onato	
10	Jane Anyango	Social Services	SA	0751080983	jane.anyango@socialservices.org	Jane Anyango	

P. O. Box 3 - 40600, SIAYA
MOA: +254 722 943269



Kenya Climate Smart Agriculture Project (KCSAP)



Office of the PCPU - Siaya

REGISTRATION FORM

ACTIVITY: VISITS TO PWD SITES AND OUTREACH MEET DATE: 11/11/2021

NO	NAME	ORGANIZATION	DESIG	MOBILE	CONTACT	EMAIL	SIGN
1.	MUSENET DOMINIBO DPHD	PARITYKU	MEMBER	0717852539	MURIEDI29@gmail.com		
2.	Museget Omerje	"	"	079270292	N/A		
3.	MUSENET ABOO OKUWA	"	"	0799301966	N/A		
4.	Tom Odoo Atieno	"	"	0727013105	N/A		
5.	ROSELYNE WAKHENDI MTS	"	"	07140127934	"		
6.	CHRISTOPHER AKINYI JIMONY	"	"	OF	"		
7.	SPRINSEK ODAMO DENGE	"	"	N/A	"		
8.	GEOERGE AYUNGO ORELO	"	"	072455407	"		
9.	MBOYA DDBRO TOM	"	"	0702514324	"		
10.	WILSON A. BOEVO	"	"	07165893530	Wilsonboevo@gmail.com		



Kenya Climate Smart Agriculture Project (KCSAP)

Office of the CPCU - Siaya



REGISTRATION FORM

ACTIVITY: Meeting Partners Dev. Management Committee DATE: 18/11/2017

NO	NAME	ORGANIZATION	DESIG	CONTACT		SIGN
				MOBILE	EMAIL	
1	TOM ODHAMBO	PANUKO DAM	MEMBER	0716279496	tom@panuko.org	
2	MADREEN KHEWYI ADI	"	"	0716279496	"	
3	AUSTINE OKUMU	"	"	0716279496	"	
4	PAMELA ATIENO OIENO	"	"	0712315596	"	
5	JOHN O. OGETA	"	"	0727851535	"	
6	ALPHONSUS OCHUO OGIHA	"	"	074993019	"	
7	John Paulo Ouyango	"	"	0792318621	"	
8	Brian Ouyango Ogege	"	"	074509992	"	
9	KENNEDY CHUKO	"	"	0720361204	"	
10	FREDRICK OUMT O	"	"	0710117032	"	

ENVIRONMENTAL SOCIAL IMPACT ASSESSMENT (ESIA) FOR PROPOSED REHABILITATION AND EXPANSION OF PANYAKO WATER PAN IN KOBONG SUB-LOACTION, WEST UYOMA WARD, RARIEDA SUB-COUNTY OF 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, domestic use and livestock production under their Investment structures in Kobong 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

QUESTIONNAIRE (STAKEHOLDERS): PANYAKO WATER PAN, WEST UYOMA WARD, BONDU - SUB COUNTY, SIAYA COUNTY

INTRODUCTION

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) intends to rehabilitate a water pan in village of Kobong' for domestic, livestock and other related use. We have been assigned the responsibility to carry out an **ENVIRONMENTAL SOCIAL IMPACT ASSESSMENT** for the development. We are pleased to seek your views (as beneficiary/neighbor/stakeholder) concerning the intended development. For this purpose it would be appreciated if you would kindly fill in this brief questionnaire. The information is **STRICTLY** for the purpose of this study and shall remain confidential

- Age of the Respondent Adult of 43 years
- For how long have you resided or worked in this area 43 (years)
- Do you know about the proposed water pan construction project under the Kenya Climate Smart Agriculture Project? Yes No
- In your opinion; in what ways will the above water pan benefit the community, country and nation in general?
 - Water for domestic and livestock use
 - Production and food security from horticulture farming
 - Food products from fish farming
 - Environment conservation along the river banks
 - Tree nursery for income generation and environment conservation
 - Create employment to our youths
- Mention the negative impacts that the water pan may pose to the neighborhood and environment in general
 - May be water borne like malaria which are manageable and treatable
 - More risks/borders are challenges for suicidal deaths in Kenya but will be fenced
 - Other impacts and diseases like HIV/AIDS may spread when people gather & interact - mitigation measures
 -

6. What do you think can be done to mitigate the negative impacts you have listed in 4 above?

- i. Mitigation and prevention strategies/plans
- ii. treatment and protection
- iii. fencing
- iv. Community Awareness and education
- v. Employ security officers

7. a) Do you anticipate any conflict or complain against proposed water pan with respect to:

• Land Yes No

If yes indicate _____

• Water Yes No

If yes indicate _____

• Public health and safety? Yes No

If yes indicate _____

• Loss of livelihood? Yes No

If yes indicate _____

• Cultural/heritage? Yes No

If yes indicate _____

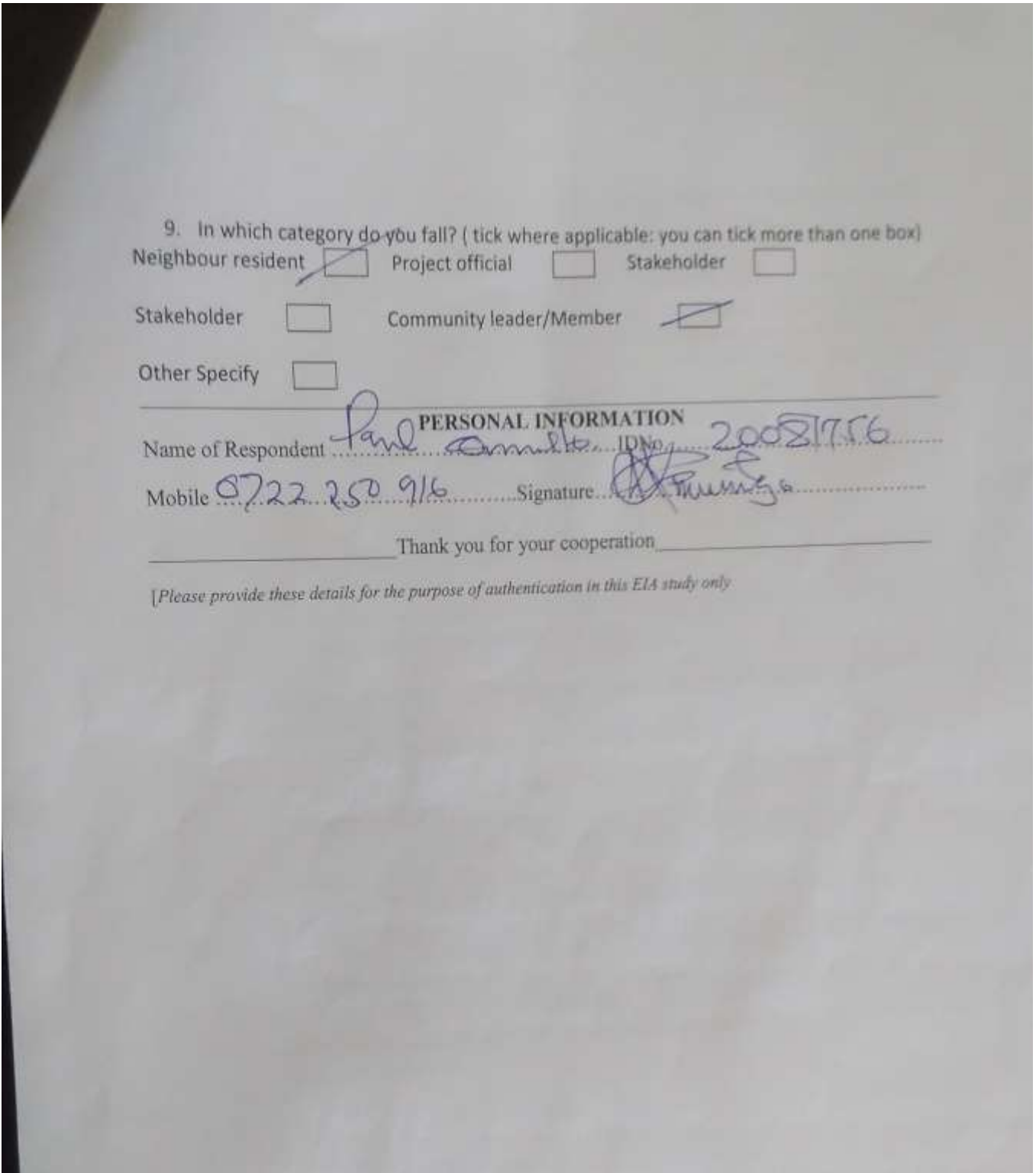
Others _____

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

- i. prevention plans
- ii. Community education
- iii. _____
- iv. _____

8. On the whole, would you have any objections to the project being implemented? _____

The whole project is supported with no objections.



9. 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

Name of Respondent Paul Amulika ID No. 20081756

Mobile 0722 250 916 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 6: Participants filling the questionnaire checklist

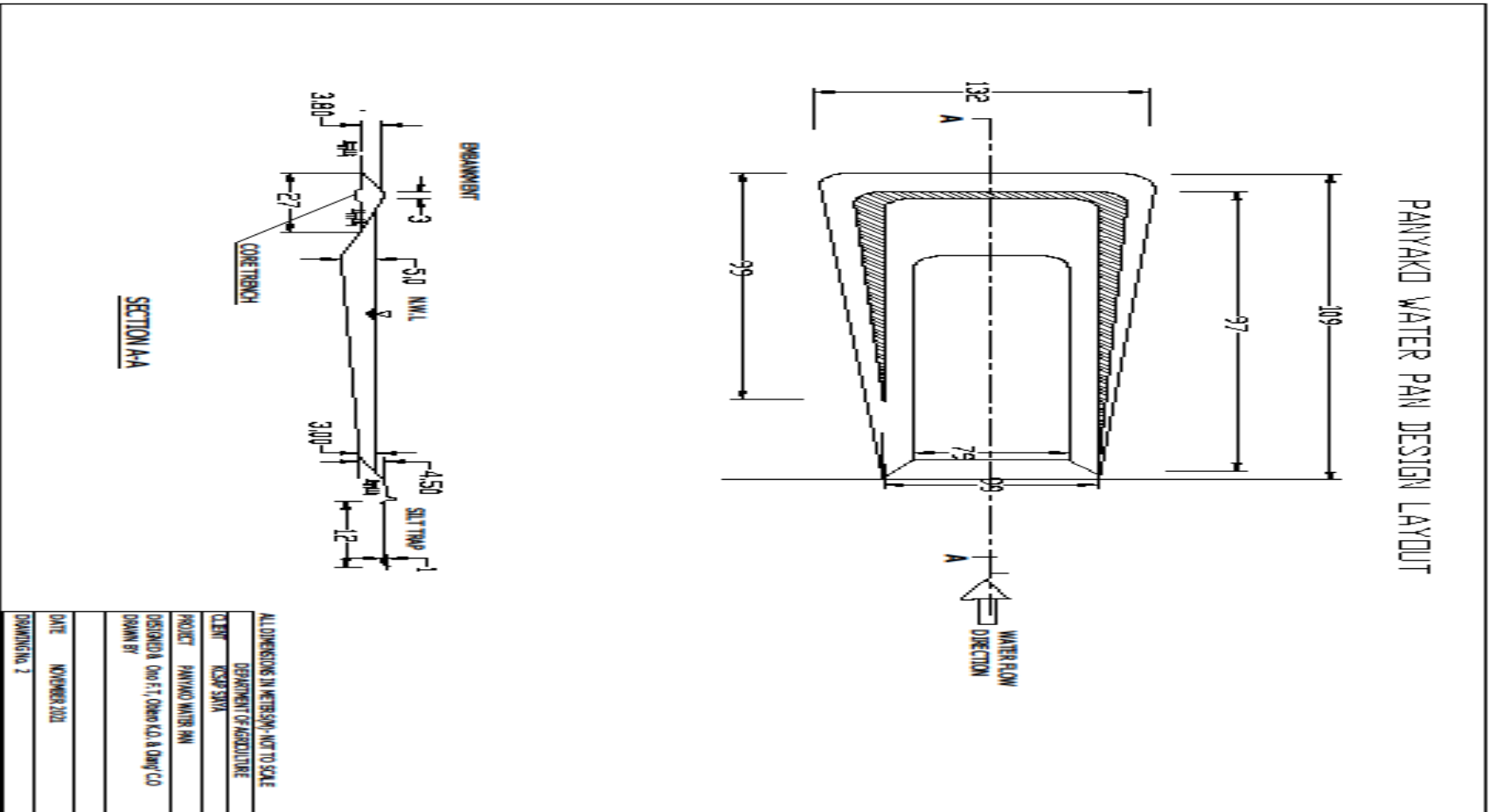


Plate 7: Participants raise hands in appreciation of the project



Plate 8: Lead farmer addressing the participants

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/EI/ERPL/13629

Application Reference No: NEMA/EI/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

P.T.O.



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



Annex 11: Panyako water pan NEMA License.