ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR PROPOSED REHABILITATION AND EXPENSION OF ACHAR WATER PAN, OKELA VILLAGE, WEST KATWENGA SUB-LOCATION, NORTH UYOMA WARD, RARIEDA SUB-COUNTY, SIAYA COUNTY.

Kenya Climate Smart Agriculture Project

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FACT SHEET

Project Name	Environmental and Social Impact Assessment for the proposed Rehabilitation and Expansion of Achar Water Pan , Okela Village, West Katwenga Sub-Location, North Uyoma Ward, Rarieda Sub-County, Siaya County.
Assignment Name	Environmental and Social Impact Assessment (ESIA) Summary Project Report (SPR)
Location	Okela Village, North Uyoma Ward, Rarieda Sub-County, Siaya County
GPS Coordinates	Latitude -0.258822, Longitude 34.342674
Project Description	Rehabilitation and expansion of the water pan Spillway channel Silt trap basin Community watering collection point Concrete tower platform with 10,000m^3 water tank Solar panels with accessories Solar pumping mechanism Livestock watering troughs VIP Latrines with bathrooms for men and women Catchment conservation measures tree nurseries Water piping system
Main source of water	It will be from pan through catchment runoff, river Achar and rain water harvesting
Proponent	Achar Water Pan Project Management Committee
Address of the Proponent	Kenya Climate Smart Agriculture Project (KCSAP), Siaya County County Project Coordination Unit P.O Box 3 -40600, Siaya .

CERTIFICATION

For and on behalf of:
West Katwenga Self Help Group Management Committee:

This Environmental Social Impact Assessment (ESIA) Summary Project Report was prepared in accordance with the Environmental Management and Coordination Act (EMCA) 1999 and the Environmental Impact Assessment and Audit Regulations 2003 (revised 2015 & 2019) in order to meet the statutory requirements for the implementation of projects under schedule II.

I, the undersigned, confirm that the contents of this report are a true representation of the ESIA process for the Proposed Rehabilitation and Expansion Achar Water Pan, Okela Village, West Katwenga Sub-Location, North Uyoma Ward, Rarieda Sub-County, Siaya County.

LEAD ESIA/ EA EXPERT

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NAIROBI, KENYA

Signature  **Date. 9th-11-2021**

PROJECT PROPONENT

Name: **Signature:** **Date:**

On Behalf of:

West Katwenga Self Help Group Management Committee

CLIENT DETAILS:

Kenya Climate Smart Agriculture Project
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P.O. Box 3 - 40600 Siaya

Name Willis Atinag Signature 

Designation: Conty Project Coordinator Date 9th-11-2021

ACKNOWLEDGMENT

We, the ESIA study team Mr. Fredrick Aloo (Lead Expert), Mr. Elijah Levo (Lead Expert) and Mr. Blaise Okinyi (Associate) wish to acknowledge and express our profound gratitude to the Siaya County Project Coordinating Unit (especially Willis Atiang the County Project Coordinator and Mr Benard Ayagah the County Environmental and Social Safeguards Officer) of Kenya Climate Smart Agriculture Project (KCSAP) for commissioning this Environmental Social Impact Assessment - Summary Project Report Study .

We appreciate the cooperation and contributions of all the stakeholders who we interacted with during this EIA report, without their support this study would not have been successful.

We would also like to affirm our appreciation to Dr. Gilbert Muthee from the National Project Coordinating Unit, World Bank ESIA Experts especially Robert and Kimberly, not forgetting Marian from NEMA Head Office for their guidance in the preparation of this SPR. Finally, we wish to appreciate the contributions made by the entire community for providing us with useful information and filling out questionnaires during the field visits and public participation forums.

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LIST OF ACRONYMS AND ABBREVIATIONS

AIDs	Acquired Immunodeficiency Syndrome
CBO	Community Based Organization
CIDP	County Integrated Development Plan
CMS	Convention on Migratory Species
CPCU	County Project Coordination Unit
CSR	Corporate Social Responsibility
C-ESMMP	Contractor Environmental and Social Management and Monitoring Plan
EAs	Environmental Assessments
EMCA	Environmental Management and Coordination Act, 1999 Revised, 2015
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMMP	Environmental and Social Management and Monitoring Plan
FGD	Focused Group Discussion
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GPS	Global Positioning System
HIV	Human Immunodeficiency Virus
IFC	International Finance Corporation
KCSAP	Kenya Climate Smart Agriculture Project
Km	Kilometers
Km^2	Square Kilometers
Ksh	Kenya Shillings
M	Meters
M	Million
m^3	Cubic Meter
mm	Millimeter
MEA	Multilateral Environmental Agreements
MOALF	Ministry of Agriculture, Livestock and Fisheries
NEAP	National Environmental Action Plan
NEMA	National Environment Management Authority
OPs	Operational Policies
PAPs	Project Affected Persons
PPE	Personal Protective Equipment
SESA	Strategic Environmental and Social Assessment
SHG	Self-Help Group
SPR	Summary Project Report
STDs	Sexually Transmitted Diseases
UG	Underground

EXECUTIVE SUMMARY

The Kenya Climate Smart Agriculture Project (KCSAP) under the Support of World Bank (WB) intends to increase agricultural productivity and build resilience to climate change risks in the targeted pastoral communities in Kenya, and in the event of an eligible crisis or emergency, to provide immediate and effective response. This includes the containment of pests such as locusts. The Project activities will contribute to these objectives by up-scaling Climate-Smart Agriculture (CSA) Practices and supporting pastoralists to adopt integrated climate-smart Technology, Innovation and Management Practices (TIMPs) and also support investments through a community driven development approach in smallholder agricultural production systems in selected 24 counties of Kenya. It's against this backdrop that the County government of Siaya one of the recipient counties is seeking to undertake Environmental and Social Impact Assessment for proposed 41,000m^3 water pan which fall under the second Schedule of Environment Management Act (EMCA). Details of land ownership is attached in the appendix

In accordance with the requirements of the National Environment Management and Coordination Act (EMCA), 1999 (REVISED 2015) and Legal Notice No 31, 32, the objective of this is to integrate environmental and social concerns in the project planning and implementation processes.

This ESIA has considered all the relevant legal, policy and institutional framework, key among them; the World Bank Environment and Social Safeguards Policies, the existing environmental regulatory framework EMCA Cap 387 and the Environmental (Impact Assessment and Audit) Regulations of June 2003, Occupational Health and Safety Act (2007), the Water Act (2016), Irrigation Act 2019, wastes disposal regulation of 2006, environmental standards, and sustainable use of natural resources principles. Other relevant legislations to this ESIA that were considered include the public health, physical planning, land planning Acts and gender promotion, HIV/AIDS prevention and control Act, and sexual offences Act.

The ESIA process was achieved through public participation exercise and consultation involving key informant (KI) interviews as well as desk reviews of critical planning documentation such as Project Development Objective (PDO). Public participation exercise took place at Okela village on 8th November, 2021 where about 40 participants (25 female and 15 male) participated in the exercise. A total of 15 questionnaires were randomly distributed to various community members. It is anticipated that the project will benefit approximately 800 households residing around the pan catchment area. The households keep livestock and undertake crop farming

The report gives a summary of the findings. Analysis from the assessment reveals positive livelihood and environmental impacts, a number of social risks such as gender based violence, environmental impacts such as dust, noise, soil erosion, clearing of vegetation and waste disposal. During the operation and maintenance phase, the negative impacts are on personal health and safety (water borne diseases may occur, mosquito breeding and drowning in the water pan), nitrate pollution from cow dung incase livestock shall be watered directly in the pan, siltation and loss of aesthetic value. Community members may also consume the untreated water. Conflicts over water demand may arise especially during the dry. Water loss through evaporation may also occur. Mitigation measures against significant negative impacts during excavation will include, observation of safety by all within the site and stabilization of embankment by planting grass and landscaping around the water pan, construction of spill way.

Others include treating water before consumption. During operation phase mitigation measures could be fencing off the site, soil conservation along the waterways. By-laws and watering schedules during dry seasons to reduce conflicts. More vegetation should be planted by establishing a tree nursery for adapted trees. Cattle troughs be provided to avoid direct access of livestock that could lead to eutrophication of the pan. During decommissioning the water pan should be filled up with excavated soils. The proponent will ensure that all COVID 19 prevention measures are enforced e.g. keeping social distance, wearing masks rightly, sanitizing and washing of hands regularly. The main issues and concerns raised during public consultation and meetings relate to employment by the contractor and design issues such as number of water toilets and maintenance of the project. The issues were addressed by various stakeholders including the project engineer who was tasked with the revision of the bill of quantities to incorporate the need for separate toilets for each gender. The PCU and the contractor will in coordination with the local leadership undertake community awareness on GBV and put in place grievance redress mechanisms (GRM) for tracking and resolving any emerging issues during the Project implementation.

The review of this ESIA is undertaken during the era of the Coronavirus disease (COVID-19) pandemic outbreak. As such, specific mitigation measures have been introduced to prevent the spread of the pandemic during the construction period. Consultations will be required as part of the mitigation measures, such as training on safety issues that can minimize the risks of catching or spreading of Covid 19.

Based on the assessment, the project is, therefore recommended for approval by the National Environment Management Authority (NEMA). The conditional license will be tracked through annual environmental and social audits after operating for one year. Implementing the ESMP will cost KES 970,000 and shall be part of the project contract. The Proponent should share the ESMMP with the Contractor and the latter will be required to develop and implement a Contractor-Specific ESMP (C-ESMP). The CPCU will follow up and monitor implementation of the ESMMP. The CPCU/ CESSCO, contractor, the supervising water engineer, the proponent and the Siaya county environmental committee will be required to ensure that the mitigation measures proposed for the construction, operation and decommissioning phases in the ESMP are followed.

The total cost of the proposed water pan is estimated at Kshs, 34,228,000 while the cost of implementing ESMMP is KES 970,000

1 INTRODUCTION

1.1 Background information

The Kenya Climate Smart Agriculture Project (KCSAP) aims at increasing Agricultural Productivity and building resilience to climate change risks in the targeted small holder farming and pastoral communities in Kenya, and in the event of an Eligible crisis or emergency, to provide immediate and effective response. Siaya County is amongst the 24 Counties in Kenya beneficiary of World Bank funded Kenya Climate Smart Agriculture Project (KCSAP). The County is currently implementing 5 sub- projects. Achar water pan located in North Uyoma ward in Rarieda Sub County is marked for rehabilitation. Initially the pan used to collect storm water which could last for few days after the rains, it was then manually improvised by the community members in 1961. The region North Uyoma experienced severe droughts in 1961 and 2007 where all the surface water sources dried up and the community had to access water from the Lake Victoria which is about 7Km. The situation in the region attracted donors such as SANA Internationals which rehabilitated the pan in 2001. In addition to rehabilitating the pan, they constructed animal watering points and a water kiosk.

The pan has wide catchment collecting all the storm waters eastwards as far as Agege. The water inlet flow then leave the pan through an outlet feeding into Mawira stream and into Ndati wetlands in Sakwa before joining the lake. The aim of the proposed project is to desilt and establish silt traps along the water ways to reduce frequent siltation of the pan. It is anticipated that upon completion the pan will serve about 4,000 people (2,200 Females, 1,800 Males), livestock and adjacent agricultural lands.

Currently the pan is heavily silted, with dilapidated flanks which cannot hold water. The pan is dry since due to the short dry spell causing acute water shortage. This prompted the county government to allocate in the current financial year Kshs. 1.5M to de-silt the pan. This alone could not sufficiently rehabilitate the pan. This prompted the community to do a proposal to source funds for the pan. It was from this background that KCSAP through Siaya county government, considered this pan for World Bank funded program. It has a capacity to provide water both for irrigation and domestic use for five villages and if rehabilitated, it is expected to sustainably serve seven villages including across season irrigation.

Another issue of central concern was the absence of a perimeter fence. The pan sits in an open field easily accessible by persons and animals. Animals particularly contribute to destruction of the pans embankment and water contamination when drinking at the same points where residents collect water for domestic use. In addition, there are no latrines or ablution block existed within the vicinity thus potential for contamination.

1.1.1 Project justification

The main project area and surrounding of Okela village relies on the Achar water pan. The other nearest open water source is Lake Victoria which is about 7Kms away. There is unreliable piped water supply which is about 2Km from the site. Previous attempts to rehabilitate the water pan have failed because of high levels of siltation. The banks of the pan do break off whenever the storm water is quite high. Due to inability to harvest and harness storm water, the run off from catchment areas has led to flooding of the surrounding farms during heavy rains. The pan does provide reliable water for farming and livestock which is relatively cheap compared to other water sources like piped water.

Specific objective

- To reduce surface water run off through harvesting of excess rain water
- To protect the catchment areas of the water pan
- To train water pan management communities on sustainable water pan management
- To establish tree nurseries
- Promote tree planting and agroforestry practices
- to provide water for crop and livestock production
- To reduce time and distance taken to fetch water for domestic use

1.1.2 Rationale for the ESIA

The Kenya government policy on projects, programs or activities such as the proposed sub-project requires that an Environmental and Social Impact Assessment (ESIA) be carried out at the planning stages of the proposed undertaking. This is to ensure that significant impacts on the environment are taken into consideration during the design, construction, operation and decommissioning of the project. The commissioning of this ESIA was informed by the recommendation of the County Director Environment (CDE) Siaya County, based on the screening report. The recommendation was in line with NEMA Public Notice on ESIA and Legal Notice No. 31 which identifies the proposed project as Low risk, thus requiring only a Summary Project Report (SPR). Besides, the ESIA was prepared as per the provisions of World Bank Operational Policy 4.01, and with other relevant laws and regulations of the Government of Kenya.

The overall objective of KCSAP is to avail to farmers' agricultural technologies, innovations and management practices to enable them cope with the changing climate. The specific objectives are to: Sustainably increase agricultural productivity and income, adapting and building resilience to climate change; and reducing and/or removing greenhouse gas emissions, where possible.

1.1.3 Objectives of the ESIA- SPR

The principal objective is to highlight the possible positive and negative environmental and social impacts expected during the construction operation and decommissioning of the proposed project, with the aim of proposing the possible mitigation measures to the negative impacts. This is in line with ensuring that such a development does not negatively impact the environment in terms of social, health, economic and physical (soil, water, plant and animals) state of the area hence ensure sustainable development

1.2 ESIA Approach and methodology

1.2.1 Environmental Screening and scoping

The Consultant first undertook environmental screening and scoping to identify pertinent issues for coverage in line with the TOR and to complement the World Bank EMSF screening checklist findings. Screening checklist form revealed that the water pan falls in second schedule 2 no 4.on Dams, rivers and water resources. The investment triggers OP.4.01 on environmental assessment and Kenyan law.

The proposed project was found to be under World Bank Category B classification since the project impacts will be site specific, few if any of them are irreversible; and in most cases adverse effects will be limited (some minor including dust, noise and health and safety impacts during construction and operational phases) and mitigation measures can be designed. Such impacts have been clearly identified both at screening stage and in this SPR report with comprehensive mitigation measures being fully designed and described in ESM&MP.

1.2.2 Desktop study

Desktop study included documents review on the nature of the proposed activities, project documents including designs, policy and legislative framework as well as the environmental setting of the area among others. Key documents reviewed included the following: Kenya policies, strategies and guidelines; National and County Laws and regulations; applicable Multilateral Environmental Agreements (MEAs) and World Bank policies safeguards.

1.2.3 Physical inspection of the site and surrounding

Physical inspection of the proposed site which included field investigation at site and surrounding areas was done on 7th and 8th November, 2021. At the visited sites, documentation on geology, soil characteristics and landscape were recorded. Photographs at selected sites were taken for inclusion in this report to further emphasis these observations. The field investigations were meant for physical inspections of the site characteristics and the environmental status of the surrounding areas to determine the anticipated impacts from the project. It also included further interviews with the community and key stakeholders.

1.2.4 Public Participation

The ESIA experts, in consultation with KSCAP, Siaya sought the views of persons who may be affected by the proposed project. The public consultations were preceded by the identification of stakeholders and project affected persons (PAPs- annex III) and plates 2, 3&4. Public meetings were undertaken at the proposed site and the project area, evidence photos attached (annex VI Public baraza attendance). During the meeting held on 8th November, 2021, there was attendance of about 40 participants of which 25 were females and 15 were men. The record of minutes is provided in annex II. To ensure adequate public participation in the ESIA process, at least 15 questionnaires were administered. The information gathered was subsequently synthesized and incorporated into the ESIA summary project report. This was done in order to incorporate the concerns and views of all persons and individuals in the project neighbourhood.

1.2.5 Data Analysis and Documentation

The Environmental Impacts Assessment report was compiled from the findings in accordance with the EIA guidelines issued by NEMA for Summary Project Report. The Consultant ensured constant briefing of the proponent during the exercise. The exercise culminated with the production and documentation of this summary project report which will be submitted to NEMA for review and approval.

1.2.6 Report Structure

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

1.3 Responsibilities and Undertaking

The ESIA was to be carried out to full completion within a period of 21 days from the date of consultancy award. The Consultant (Lead Expert) coordinated the day-to-day functions and any related institutional support matters. The Consultant ensured constant briefing of the client during the exercise. The Summary Project Report (SPR) from the findings was compiled in accordance with the World Bank ESS guidelines as well NEMA

2 NATURE OF THE PROJECT

2.1 Introduction

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

2.2 Design Concept and Material

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

2.2.1 Design

The siting, design concept and criteria was developed in accordance with the general guidelines and standards used in the design of water harvesting and water supply projects in Kenya and are in line with international standards and for best practices. The design adopted best practices and experiences drawn from past and best water pans

Detailed topographical survey and on the map precisely locate the pan and the spillway, to enable one to exactly calculate its storage capacity and the height and length of the wall is a must. This will lead to design of the foundation, the wall and the spillway. It will then give a basis for preparing the bill of quantity (the volume of soil to be moved) and planning for and calculating the costs of the construction phase.

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

2.2.2 Sizing

The proposed water pan storage requirement yield is 217m^3/day. A pan of capacity of **42,000m^3.** is proposed at against an estimated requirement of **41908m^3**demand. The catchment area is estimated at 3 km^2. Catchment yield is estimated at 135,500m3 per year.

According to the Ministry of Water and Irrigation Practice Manual for Small Dams, Pans and Other Water Conservation Structures in Kenya dated August, 2015 on page 14-2 requires pans to have a minimum depth of 2.50m and a maximum of 5.0m. A minimum depth of 5ft in wet areas to a maximum of 12 ft in arid areas to ensure a permanent water supply by ensuring deep water to meet the intended use and to offset probable seepage and evaporation losses is recommended (In the Agriculture Handbook 590: -Ponds-Planning, Design and Construction by USDA page 10).

2.2.3 Dimensions of the Component Reservoir

Reference: Longitude-169321m E **Latitude**-9825965mN Altitude 1188m ASL.

(a) Pan

Table 2-1Dimension of the pan

1 Pans as follows:-			
	Shape		Rectangle
	Width	80	m
	Length	160	m
	Depth	3.2	m
	Capacity	40960	
	Orientation		North West-South East
	Inlet		(As indicated in the feasibility studies) Please refer to the feasibility study report from the proponent

Annual Evaporation = 1585mm

Fetch = 160m

Maximum Depth = 3.2m

Compaction of the bottom will be done to ensure permeability.

(b) Silt Trap

Impounded area 600m^2

Storage capacity 1200m^3 (30m by 20m by 2m depth)

Maximum depth 2.0m

(c) Spill Way

Assume: - width of spillway = 10m and depth 0.50m

Maximum allowable slope = 0.50%.

(d) Orientation

The pan should face north west to South East to conform to the shape of the catchment with if possible longest dimensions in north west to South East and smallest in South West—North East direction

2.2.1 Materials, equipment and labour

Components of the water pan

- Pan area
- Spillway channel
- Silt trap basin
- Community watering point
- Concrete tower platform
- Solar pumping mechanism
- Livestock watering troughs
- VIP Latrines with bathrooms
- Catchment conservation measures

2.3 Proposed Project Activities

The activities associated with the proposed are planning which cvers: designs, topographical surveys to determine the capacity of the pan. This is followed by construction and operation activities. The activities are detailed in the sub sections

2.3.1 Planning Phase Activities

The main activities considered during this phase are: community mobilization, tendering services as required by procurement regulations, site hand over, hand over of drawing and building plans and site layout.

2.3.2 Construction Phase Activities

The phase entails infrastructure that comprise of check dams upstream to control soil erosion Pan ancillary works will include but not limited to the following:

- ✓ Excavation works
- ✓ Construction of pipe draw off system
- ✓ Construction of spillway concrete seals
- ✓ Construction of cattle trough
- ✓ Construction of communal water pipes
- ✓ Fencing of the reservoir as described in the bill of quantities and technical drawings
- ✓ Construction of two door pit latrine
- ✓ Construction of two silt traps with seals

The project will be fully funded by KCSAP will be about 30 percent contribution from the community In order to mitigate any negative impacts emanating from the construction activities of the proposed development, relevant and cost-effective measures have been proposed in the Environmental Management Plan.

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2.3.3 Operation Phase Activities

On project completion the facilities would be utilized for the intended purpose. The project operational activities will include: putting appropriate conservations measures around by planting grass along the embankments and trees species that do not extract a lot of water from the ground the pan management committee will work closely with Kenya Forestry services, Placing water collection points atleast 5meters away from the protected pan, Running a solar powered water drawing pump such that water is drawn outside the pan to avoid contamination.

Provision of water treatment tablets to purify water that will be used for domestic purposes and establishment of fish in the pan to harvest mosquito larvae and provision of mosquito nets

2.3.4 Decommissioning Phase Activities

Decommissioning of the constructed water pan will become necessary if or when the water pan attains its end life i.e when it no longer become productive or when the need arises. One this occurs, the affected pan will be deactivated according to the well closure procedure. Non-reusable pipes will be sold to licensed scrap metal dealers. The closure of the well will involve removing the piping system and backfilling of the depression left behind as necessary. The affected pan will be backfilled, landscaped and replanted with suitable indigenous grass and trees.

2.4 Project Cost and Implementation Schedule

Based on the technical design's bills of quantity (BOQ) for the project implementation, the project is estimated to cost **Kenya Shillings 34,228,000**

3 LOCATION OF THE PROJECT

3.1 Introduction

This chapter presents the location of the project, land ownership, baseline information, supportive environmental infrastructure, land use plan and Grievance Redress Mechanism.

3.2 Proof of Land Ownership

The Achar water dam is on public land with a parcel number 373/KATWENGA/EAST UYOMA registered under Achar Water pan. The land around the pan where farming will be done are public and privately owned but the owners are willing to offer more for production. Attached Annex iv. The surrounding farms are privately owned and the owners have shown willingness to engage in horticultural production and commercial tree nursery establishment using water from the water pan.

3.3 Project Location

The project is located in Okela Village, West Katwenga Ward, Rarieda Sub-County, Siaya County. The project site lies within Latitude -0.258822, Longitude 34.342674 1188m a.s.l. The project will also benefit the following villages: Chianda, Kobong villages, ,Ochienga, Odede and osewe .A geographical satellite image of the project location showing proposed site of the pan is presented in figure 3-1 below. The pan is situated along Chianda Mituri road it is about 2Kms from the road

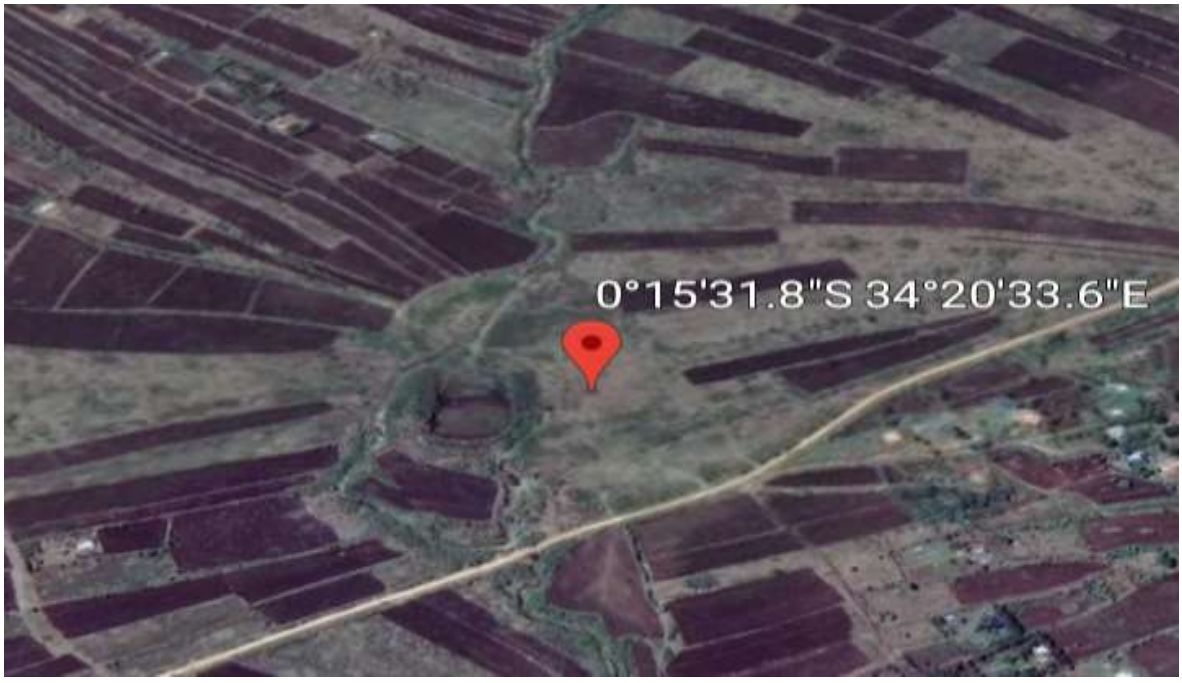

Figure 3-1 Location of project site

3.4 Environmental Management Supportive Infrastructure

The proposed project site requisite environmental supportive infrastructure. There exists an earth access road which is about 50 meters from the main Chianda- Mituri tarmac road that can be used to access the site. Within the area, there is an unreliable piped water supply system about 2km. The water supply is supported by Siaya water supply Company. The project site is connected to power from the grid and a transformer is located about 300 meters from the site.

3.5 Physiographic and Natural Conditions

3.5.1 Physical & Topographic Features

The project area is within a basin surrounded by relatively plain terrain. Sizeable runoffs are often received during rainy season within this project location though vulnerability to soil erosion is moderate, disturbance of the soils during construction phase can increase soil erosion risks.

3.5.2 Geology and Soils

The soils in the catchment site are predominantly humic gleysols and vertic gleysols that are poorly drained, deep to very deep, dark grey in colour with mottled clay and a thick acid humic top soil. The parent material are basic igneous rocks (basalts and nepheline phonolites). These type of soils expand during wet season and crack during dry season. As such soils favor water retention, due to their poor workability during rainy season, the proponent will endeavor to undertake the construction during relatively dry season so as to mitigate on energy losses and emissions. Plate 5 provides evidence on some of the soils in the area.

3.5.3 Climatic Conditions

The County spreads across agro-ecological zones LM1 to LM 5. According to the Kenya Soil Survey and Integrated Regional Development plan for the Lake Basin Development Authority, the lower part of the County and especially the shores of Lake Victoria can be categorized into semi-humid, semi-dry Lower Midland zones (LM4 and LM5). These zones cover the whole of Uyoma in Rarieda Sub-County and Yimbo in Bondo Sub-County. The lower central parts of Siaya County, covering the whole of Sakwa and Asembo in Bondo and Rarieda Sub-Counties respectively.

(a) Precipitation

The lower area of Rarieda where the proposed site is located is in the lower side of the County hence receiving rainfall ranging between 800 – 1,600mm. Dry spells are on average longer during the second wet season, with consistently close to 60 consecutive days of moisture stress. Consistent moisture stress occurs for fewer than 30 days during the first season. Extreme

precipitation and flood risks6 are moderate to low in both seasons, with most years receiving 10-25 mm of precipitation on the wettest day.

(b) Humidity

Humidity is relatively high with mean evaporation being between 1,800mm to 2,200mm per annum within the County. The relative humidity ranges between 73 per cent in the morning and 52 per cent in the afternoon.

(c) Climate Change issues

Siaya County is characterized by high poverty levels (47.56%) and food insecurity. Agriculture is the main source of livelihood in the County, contributing about 60% of the household income and providing almost 61% of all employment opportunities. Droughts and intense rainfall already constrain agricultural productivity and food security in Siaya County; climate projections indicate increasing events of drought and intense rains.

Intense precipitation and heat stress are both hazards that contribute to agricultural risk in the County throughout the year, whereas dry spells are common in the Second wet season. Climate has already been observed to change slightly in the County. Since 1981, the first wet season, has experienced a ~0.5ºC increase in mean temperature and reduction in crop cycle, but little to no change in precipitation on average. However, there has been an increase in drought risk due to hotter temperatures. The Second wet season experienced no change in temperature but had an increase in precipitation of approximately 15-25%. This has resulted in increased risk of flooding but fewer dry years and associated drought risk. Projections for 2021-2065 show that prolonged moisture stress will occur in the first season of the year, whereas precipitation will change little in either season.

3.5.4 Land and Land use/Zonation

The sub Project area can be categorized as semi-humid, semi-dry Lower Midland zones (LM4). The climate can support suitable crop varieties such as maize, beans, sorghum and cassava and sweet potatoes (Table 2), with butternut and other horticultural crops such as tomatoes having great potential under irrigation. Leucaena, as an agroforestry species has the potential in soil fertility management and resilience building for livestock farmers.

Table 3-1 Agro -Ecological Zonation Of Siaya County

Zone	Division /Subcounty	Suitable crops
LM1	Gem, Yala	Sugarcane, Maize, beans, finger millet, coffee, sweet potatoes and horticulture
LM2	Alego Usonga	Maize, beans, tobacco, finger millet, coffee, sweet potatoes and rain fed rice
LM3	Sakwa and Asembo	Maize, beans, finger millet, sorghum, cotton

LM4	Uyoma in Rarieda Sub-County and Yimbo in Bondo Sub-County	Sunflower, sorghum, cassava
LM5	Uyoma in Rarieda Sub-County and Yimbo in Bondo Sub-County	Sorghum, Millet

Source: Jaetzold et al. 2007

3.5.5 Crop Farming

On the other hand, crop farming is as well a common means of production within the project area. This is largely rain fed where farmers do cultivate the following crops; cassava, cow-pea crops, green-grams, maize and sorghum amongst others. On the other hand, Kales and tomatoes are produced through irrigation in small holder units. Famers use water pumps in irrigating their farms during the production process which is evidently an inefficient means of water use. The produce harvested from Okela village where the project lies do contribute to crop production in Siaya. Table 2.3 indicate crop production in Siaya in the year 2013 and 2014.

Table 3-2 *Production by Type and Quantity, 2013 – 2014*

	Crops	**Tons**	
		2013	**2014**
1	Maize (tons)	129,818	1,372,914
2	Beans (tons)	20,262	348,283
3	Sorghum (tons)	22,587	128,726
4	Cassava (tons)	87,606	28,700
5	Green Grams (tons)	79	4,105
6	Tomatoes (crates)	6,295	7,118
7	Kales (bags)	1,310	1,965
8	Cowpea leaves (bags)	1,200	4,763

Source, KNBS 2015

Both floods and drought episodes have affected these means of production in the past. Finally, it was also observed that a section of farmers' area steadily embracing horticulture vegetable production as opposed to the traditional system of production.

Small scale trade is also a common means of production within the project area. Different household consumer's goods are sold within the main centre located approximately 500 metres from the project site.

Livestock Production

Livestock-keeping is also an important sector among the people residing in the sub project area. Meat, milk and eggs provided by livestock serve as important sources of high-quality protein to complement diets that are based on starchy crops like maize, bananas, millet and cassava. Cattle are important in a few homes for traction and manure. The main type of cattle kept by

farmers is of the Zebu type. The number of cattle households on average in the project area is 7 head of cattle and 15 chickens. The production level for milk remains low at 2litres per cow per day.

3.5.6 Flora and Fauna

The area is largely settled, some of the most common trees in the area include Acacia *depanolobium, Balanites aegyptiaca) and Euphorbia tirucali* . The tress is mainly used for timber construction and firewood. Common grass species is Cynodon plactostachyus. Some of the trees are deciduous as an adaptive mechanism to the dry conditions. The most common fauna found in the project area include birds, insects, rodent and snakes Others are majorly domestic animals consisting of cattle, goat, sheep and poultry

3.5.7 Environmentally sensitive areas

There are no ecologically sensitive areas/sites such as wetlands, rivers, forests, or wildlife migratory corridors which might be adversely affected by the project activities.

3.6 Socio-economic Environment

3.6.1 Population

North Uyoma ward where the project lies is densely populated as depicted in Table 3.2. This phenomenon put pressure on need to basic services such as supply of water for both household and domestic use. Approximately 1,500hh depend on the water pan directly through domestic use and livestock water.

Table 3-3 Population Characteristics by Ward and Location of the North Uyoma Ward,

		Total	Male	Female	Household Size	Land Area	Density per Sq. km
Ward	North Uyoma	17401	8348	9053	4044	55.3	314
	East Katwenga	4597	2232	2365	1005	17.3	266
	West Katwenga	4087	1905	2182	988	13.2	309
	Ochienga	4753	2327	2426	1081	16.8	284
	Ragengni	3964	1884	2080	970	8.1	492

Source: KNBS, 2019

3.6.2 Infrastructure and Access, Road, Rail Network, Ports and Airports, Airstrips.

There is an electric powerline is located about 300 meters from proposed site. There is no piped water around the surroundings of Achar water pan. Approximately 60 percent of the community rely on the water pan for both domestic and livestock use. The pan is located about 50 meters from the main Chianda- Okela – Mituri tarmac road

The means of communication in the subproject area are as listed in Table 4. Access to the means of communication is relatively high especially the mass media. This could be advantageous in advocacy initiatives on issues such as GBV. The mobile network coverage in the area is relatively high at 83 % compared to an average of 70% of the county but lower than the national connectivity rate of 85%. Network signal is good with all networks well represented.

Table 3-4 : ACCESS Ownership and communication

Communication channel	% of Households with access/ownership
Radio	78 (75)
TV	15 (13)
Mobile Phone	83 (90)
Computer	<1 %

Source: Field data collection, 2020

3.6.3 Housing

The major housing type in the area is mud walled iron roofed houses. Table 3 provides a comparison of housing type in the area with the county aggregated statistics. As housing type reflect wealth status, the Project area could be said to be relatively rich compared to other areas of the county.

Table 3-5: Housing type in the Project Area

Housing type	% of Households in the Project site	County indicators
Earth floor	83	90
Cement Floor	17	12
Mud walled	85	82
Corrugated Iron Roof	78	61
Grass thatched	22	25
Brick /Stone wall	15	5%

Source: ESIA team field data analysis, 2020

3.6.4 Health and Environment

Residence of the area primary access health services from Chianda dispensary which is 3km from the site. This is government health facility majorly dealing with outpatients. Common water-borne diseases are treated in this health facility with extreme cases referred to Bondo Sub County Referral facilities. Inadequate water has in the past contributed to an increase in cases of some of the water related diseases at community levels. These cases are reported in the KNBS 2015 report “County Statistical Abstract Siaya County”. Conversely, extract from the named report specific Bondo Sub County are presented in figure 4.3.

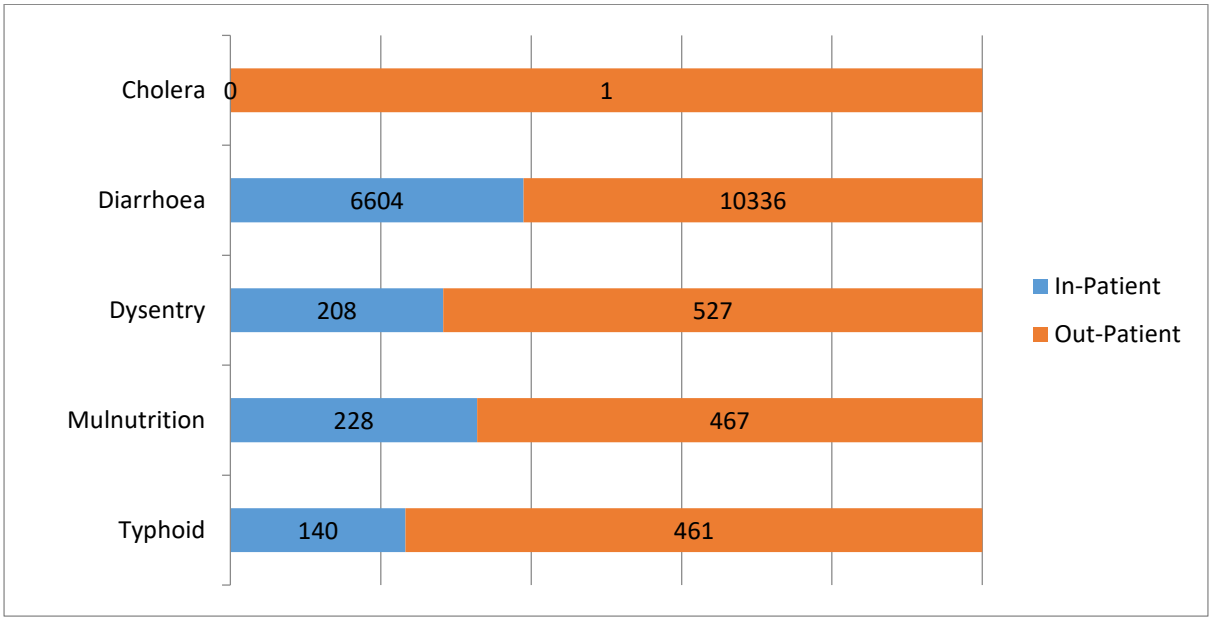

Figure 3-2 Out & In patient Morbidity for Patients below 5 Years of Age, Bondo Sub-County, Siaya
Source KNBS 2015

Water Access and Sanitation

Streams, wells, boreholes, roof catchment, rivers, Lake Victoria, water holes, dams, ground catchments and piped supplies are the main sources of water for communities in Siaya. However, the Project area's groundwater potential is highly limited by lithology. The distribution of water sources most of which is surface water depends on the season and also weather patterns. Though the long-term objective of the Government is to enable household's access water within 500m of their settlement, the intervention measures the Ministry of water has put in place so far in terms of piped schemes, point water sources like boreholes, shallow wells have not been met in the area. The average distance to a water point in the project area is 0.8 Km and it takes about 50 minutes which above the county average of 0.5 Km and time of 0.5 hours respectively. About 78% of the residents have pit latrines but there is no sewerage system in the area. This could imply risk of surface water contamination with faecal material.

3.7 Conflict and Grievance Resolution Mechanism (GRM)

The main grievances experienced with the area involve land 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 also common occurrences. The methods used to resolve such conflicts and which can be drawn upon by the BMU in the area include.

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

4 PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATIONS.

4.1 Overview

A public participation and stakeholders consultations were undertaken in line with the Environment Management and Co-ordination Act 1999, and the County Government Act, 2012 as well as the World Bank ESS guidelines and policies. Plate (8-11 and 12-13 in appendix XII) provides evidence of the ESIA process compliance with the provision.

4.2 Objectives

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

- ✓ To seek and examine views on health, safety, social and environmental issues from the potentially affected community;
- ✓ To lay the foundation for future negotiations on any issues that may arise so as to build consensus and reach a mutually acceptable resolution of issues.
- ✓ Provide the establishment's neighbours/community with a forum to air any issues or concerns they may have with the establishment's operations on Health Safety, social and Environment (HSSE)
- ✓ To facilitate the integration of plausible EHS management practices into the Environmental and Social Management Plan(ESMP) as recommended by neighbours/community

4.3 Methodology

4.3.1 Stakeholder mapping

The environmental and social assessment public participation exercise was conducted in November 2021 by the expert using 3 approaches (i) Focus group discussions and Key informant interviews, (ii) Field surveys and observational checklists and (iii) Public meetings. In general, the following steps were followed in carrying out the entire process: -

- ✓ Identification of institutions and individuals interested in the process and compiling a database of the interested and affected parties
- ✓ Administration of questionnaires to different target groups and local community members in the administrative area for the proposed project site (Appendix I)
- ✓ Public / Technical Meetings at various levels and with different target groups

Plate 4-1 Participants filling questionnaire

4.3.2 Public consultation questionnaires

Consultative experts' meetings were continuously held during the field exercise to consolidate the issues affecting the project as well as capturing issues raised by the project affected persons. fifteen questionnaire checklists given out to the stakeholders for filling and analysis was done.

4.3.3 Public consultation meetings

Two comprehensive public meeting as well as technical meetings were held on the dates of 8th November ,2021 and 10th November, 2021 with the local residents, chiefs, Village elders, and other local administrative leaders in attendance in the project area. (Minutes of meeting and list of participants Annex II and III respectively). The Issues arising in the meeting are captured in as reported in the following sections. The meeting was used to publicize the proposed rehabilitation of water pan sub-project and the anticipated effects and benefits.

During the public participation meeting, stakeholders had a chance to interact with the proponent represented by the ESIA expert and ministry of agriculture officials at county level. The findings are incorporated into this report and captures the issues, suggestions, concerns and recommendations from public meetings on site. The meetings were well attendend and the attendees participated actively during the meetings (Plate 4-1 and 4-2).

Plate 4-3 Lead Expert addressing participants

Plate 4-2 Participants filling questionnaire

4.4 Consultation and Disclosure Outputs

The Appendices present the information on the public consultations undertaken under the environmental impact assessment for the proposed water pan sub-project. This information includes selected responses as detailed in the minutes (***Appendix ii***). It was noted that members lauded the project and were eager to see the start of the project. However, there were a few areas that the members sought clarity. A summary of the key concerns raised by the participants is provided in table 4-2 below:

Table 4-1 Stakeholder Consultative meeting key concerns

S/No.	Issues raised by the members	Concerns	Response
1.	**Employment opportunities**	project will create employment opportunities during the project cycle from construction to operation	The community agreed and promised to provide both skilled and skilled labour
2.	**Installation of solar panels**	Question was raised that what will happen if the solar panels fail to generate power	Some members of the community will be trained on operation and maintenance
3. E	**Excavation**	Once the excavation is done where will the soil be deposited? Wont there be a lot of siltation in the pan	The excavated soil will be used to strengthen the embankments and floor of the pan by compacting
4.	**Contingency funds**	Is there any funds for contingency or in case of emergency	Yes in any BQ or budget there is 5 to 10 % c
5.	**Erosion**	Stakeholders residing around the pan catchment sites will be encouraged to plant trees and construct terraces along contours to reduce soil erosion	The community requested for capacity building from the county agriculture office
6.	**Possibility of water backflow resulting in eroding of the embankment**	The pan have once broken the embankments resulting in flooding downstream and erosion	The engineers have taken note and will look at the historical data on flow of water and the indigenous knowledge of the people
7.	**Mosquitoes/Malaria incidences**	The pan will be installed with fish that can eat mosquito larvae The surrounding community members will be provided with mosquito nets	The pan management committee was asked to seek for support from the county government and local supporting institutions to provide mosquito nets
8.	**Maintenance and sustainability of the pan**	The project management committee will be trained on sustainability and pan management issues a business plan will be put in place	A sustainability strategy to be put in place so that pan maintenance issues can be addressed by a committee which has a funding mechanism

9.	**food security and nutrition security especially vegetable produce**	The members of the pan will be encouraged to form groups and will be linked to producer organizations so that they can have collective burgaing power when marketing their farm produce	Producer organization that support the various value chains will be linked to the farmers
10.	**Improved Economic status**	Income at household level will be enhanced, communities will be able to sell farm, livestock and livestock products at favorable prices .	The community members will be connected to producer organizations in order to fetch out better prices
11.	**Enhanced livelihood resilience and alternatives**	Since water will be available throughout the year, It will be possible to produced food crops and animal products throughout the year	Idleness in the community will be reduced and community members will be engaged in productive labour
12.	**Availability of clean water**	There will be a draw off pipe from the pan where water will be purified and water treatment tablets will be given to the pan users	A water kiosk will be put in place as per the designs, water for livestock, crops and domestic use will be drawn from outside the pan and not directly
13.	**Catchment protection**	The stakeholders will be encouraged to establish tree nurseries and agro-forestry in their farms along the catchment areas	Communities around the catchment areas to be sensitized and encouraged to grow trees for commercial purposes
14.	**Accidents during construction**	During construction and operation phases accidents are likely to occur	The proponent will strictly adhere to safe working practices to protect the workers, neighbors and passers-by
15.	**Availability of water for domestic and livestock**	Water will be available for irrigated crop farming Livestock will be sold at good prices in the market due to good body condition. Issues of overgrazing will be reduced. There will also be minimal conflicts over access to natural resources.	The community promised to impose a criteria water will be used for crop irrigation and livestock production throughout the year

4.5 Salient issues

4.5.1 Opinion on Project implementation

It is clear from the filled questionnaires received on sub-project at North Uyoma will serve an important role of providing the community with water for livestock and agriculture. All the residents admitted that they were interested in this project more solely for their improved food security and livelihoods in so doing pointed to the benefit that will accrue to them.

4.5.2 Suggestions and comments from public consultations

- The cmmunity self help group, Pan managment committee must take full resposibiliy in sustainability and maintainance of the pan
- Farmer views should be incorporated in the programme. They suggested to have a dedicated committee to be airing farmers concerns.
- Ensure the workers/employees of the proposed project are insured through WIBA for adequate compensation due to injury while at work.
- Jobs opportunities that will arise during the construction of the water pan sub-project and operation phase should be reserved for the residents of the project areas.
- Construction work should strictly observe standards of Occupational Health and Safety including use of appropriate PPE. During operation, need for appropriate PPE such as gloves, gumboots to prevent occupational diseases, injuries and accidents should be emphasized.
- The contractor should have a holding/launching yard for materials and equipment to control environmental pollution.
- The contractor should also strive to use high quality construction materials as detailed in the design
- Educating on HIV aids control and COVID-19 prevention

5 POTENTIAL IMPACTS AND MITIGATION MEASURES

This chapter presents the assessment of the issues likely to arise as a result of implementation of the proposed project. The impacts are presented in-regard to their likelihood of occurrence on the physical, biological, occupational and socio-economic environments.

Table 5-1 Summary of expected impacts, rating and development stage

Impact	Impact rating	Phase
Soil erosion impacts	Low (negative)	Construction phase
Public health and safety	Low (negative)	Construction and operation
Impacts on air quality	Low (negative)	construction
Waste generation	Low (negative)	Construction and operation
Siltation	High (negative)	Operation
Biodiversity conservation	Low (Positive)	Construction and operation
Soil conservation practices	High (Positive)	Construction and operation
Socio-economic impacts	High (positive)	Operation
Visual impacts	Low	construction

5.1 Positive Environmental and Social Impacts during construction phase

The anticipated positive impacts include the following: biodiversity conservation, availability of reliable water, improved household incomes, employment creation, enhance market economy, increased revenue generation the county

5.1.1 Positive environmental impacts

5.1.1.1 Erosion Control

Construction of water harvesting structures such as silt traps. Embankment of the pan

5.1.1.2 Biodiversity conservation and enhancement

Landscaping and planting of trees and flowers in the pan compound environments will enhance the aesthetics and community tree planting will enhance biodiversity of the area. The group nursery will provide seedlings to the community and environmental conservation.

5.1.2 Positive social impacts

5.1.2.1 Informal business Growth

During construction the informal sector will benefit from the operations. This will involve informal traders who will sell their products to be used on site. Such a move shall promote local informal entrepreneurs in the local project area

5.1.2.2 Employment opportunity

Both direct and indirect forms of employment shall arise from the project initiation. Direct employment will be mainly through skilled and unskilled laborers whose workforce shall be needed in the construction. Several workers including casual laborers, masons and carpenters are expected to work on the site from onset of the project to the end. Indirect employment will

be experienced through buying construction materials and sale of food to the construction workers by the neighbouring communities.

5.1.2.3 Economic gains

The local economy shall gain much from the project in that materials for building shall be sourced locally within the county and that all the materials are charged VAT, hence increasing revenue collection in the country

5.1.2.4 Provision of Market for Supply of Building Materials

The project will require supply of construction materials most of which will be sourced locally within the vicinity and environs. This provides ready market for construction material suppliers such as quarrying companies, hardware shops and individuals with such materials.

5.1.2.5 Creation of employment opportunities for residents of the project area

The proposed project will provide short term and long-term employment opportunities to the local community. The construction phase will provide short-term opportunities for casual work and semi-skilled labour. During the operational phase, long-term employment opportunities will also be created which will generate income and improve their livelihoods

5.1.2.6 Increased revenue generation by the County and National Government

The project will contribute to the county and national government kitty. The contractor will pay Value Added Tax (V.A.T) on purchasing materials for the project. Construction workers will also pay income tax from their earnings while working on the project. The project after completion will allow the county government to collect revenue from sale of farm produce in the local markets and firewood from timber harvested from planted trees

5.2 Negative Environmental and Social Impacts during the Construction Phase and Mitigation Measures

5.2.1 Negative environmental impacts during construction phase

5.2.1.1 Loss of Vegetation cover

During the construction phase of the project, bush and tree clearing will be undertaken in the areas to be inundated to minimize the impacts of water pollution from decaying vegetative matter that would die after inundation. Actual construction activities will lead to further loss of vegetative cover at the site of the construction camp for the workers who are likely to be engaged in the actual construction activities. This impact is however not expected to be significant. While no endangered or threatened species were identified in the area, clearing and subsequent inundation constitutes a loss of biodiversity on flora. The vegetation is also home to many invertebrate and avifauna, who will be rendered dispossessed of their habitats

Mitigation:

- ✓ Where possible the contractor to exercise selective removal of existing indigenous tree species

- ✓ The Project component on NRM and SLM to support community establishment and planting of indigenous trees in the catchment
- ✓ The contractor to plant grass and indigenous tress around the pan area as per the ESMP recommendations
- ✓ excavations of the site will be confined only within the sections upon which construction is taking place
- ✓ Excavated earth will be held away from drainage channels
- ✓ The PCU will develop catchment conservation plans to address soil erosion concerns in the catchment

5.2.1.2 Surface ground water pollution/contamination

Earth movement, disposal of vegetation and other cleared materials and the inadequate disposal of liquid and solid waste, including the human waste from the workers, are likely to cause physical and chemical alteration of surface and ground water quality. Civil works, excavations, or an inadequate planning of cuts and fills, may affect the water table significantly. The excavation for spillway and diversion channel may also affect the turbidity and water quality, as well as the level and course of Changes in surface hydrology are likely to alter the flow of water into the pan

Mitigation measures

- ✓ The contractor to construct a standard temporary pit latrine for the workers
- ✓ Contractor to identify an appropriate site pit for disposal of vegetation and biodegradable plant material
- ✓ A temporary incinerator to be constructed to burn non bio degradable solid wastes such as plastics
- ✓ Civil works, excavations, cuts and fills to be compacted so that there is minimal soil loss

5.2.1.3 Oil spills/Fuels and Lubricants

The storage or spillage of petroleum hydrocarbons on site presents a hazard and the release of hydrocarbons into the environment could result in significant impacts on a variety of receptors. The pathway for pollution is soil or water, and the primary receptors include the sub-soil and groundwater. Other receptors include air (from fuel vapors) and people (through dermal contact, inhalation or ingestion). It is however worth noting that the risks of a major oil spillages occurring are minimal.

Mitigation Measures:

- ✓ The contractor should properly handle, storage, and disposal off oils and greases and their wastes during construction by ensuring that servicing is strictly done at designated servicing yard or external petroleum stations
- ✓ Proper maintenance of vehicles and other equipment (using petroleum products) to avoid fuels and lubricants spills at the project site;

- ✓ Safety procedures for fuel storage and re-fueling should be well understood and implemented by site staff; and
- ✓ Oil residuals including waste oil, lubricants, used filters, should be carefully collected and stored for safe disposal, in order to prevent migration of contaminant hydrocarbons into storm water or groundwater resources

5.2.1.4 Air quality degradation due to dust and exhaust emissions

The following emissions will be expected to result from construction activities. This would in turn lead to poor quality of life as well as upper to lower respiratory infections and silicosis condition:

a) Dust from excavations and earth moving vehicles as well as materials delivery;
b) Emissions such as smoke, hydrocarbons and nitrogenous gases among others from machinery exhausts

Mitigation Measures

- ✓ Personal protective equipment (PPE) such as dust masks must be worn in the immediate vicinity of the operations during excavation;
- ✓ The stockpiles of earth generated during construction works should be suppressed by spraying water or water based mixtures. Spraying should also be carried out on unpaved road accesses regularly;
- ✓ All machinery and equipment should be maintained in good working order to ensure minimum emissions including carbon monoxide, oxides of Nitrogen and Sulphur, as well as suspended particulate matter;
- ✓ Drivers of construction vehicles and delivery trucks should be cautioned to drive slowly near the site to avoid creating dusty conditions.

5.2.1.5 Increased generation of solid wastes

Most of the waste will be generated during the construction waste. This includes papers used in packaging cement and soil this can pose the risk of the site being a breeding for pests, pollution of the physical environment and attraction for scavengers. Temporal storage on site for solid waste such as paper can be done with eventual disposal in compliance with waste regulations. Recycling and reuse strategies can also be achieved.

Mitigation:

- Use of an integrated solid waste management system i.e., the 3 R's: 1. Reduction at source 2. Reuse 3. Recycle where possible.
- Reuse packaging materials such as cartons, cement bags, empty metal and plastic containers to reduce waste at site;
- Waste collection bins / receptacles to be provided at the project site
- Contractor to dump unused excavated materials and debris in designated places
- Contractor to re- use excavated soil for the pan wall/embankment

5.2.1.6 Noise and Vibration

There will be noise and vibrations generated during the construction phase but it will be no different from that on any other typical construction site. The noise impact during construction is expected to be negative and short-term. Major sources of noises and vibration will come from: drilling during construction equipment to place charges and earthmoving machinery, as well as noise from the work force itself. The major receptors are expected to be the construction workers as well as any immediate neighboring premises.

Mitigations Measures:

- ✓ *Conduct noise measuring to determine levels and extent of harmful noise and provide PPE (hearing protection) to persons who must operate within or visit the identified high noise areas;*
- ✓ *Investigate the possibility of investing in silencers on machines to reduce the quantity of noise produced*
- ✓ *Inform local residents of any abnormal noise generating construction activities to minimize disruption to local resident*

5.2.1.7 Impact on access road

Although it is anticipated that the existing access roads are adequate for the transportation of materials, the contractor must maintain these roads during the construction period.

Mitigation Measures:

- ✓ *Vehicles should abide by the speed limits and by-laws of the area;*
- ✓ *Movement of heavy construction vehicles should be planned appropriately*

5.2.1.8 Visual impacts and aesthetics

Excavation and refurbishment works will result in changes in the physical appearance of the project site. Volumes of earth will be excavated and stockpiled while construction materials such as sand and ballast will also be stockpiled at the site. Construction waste may also litter the site and the surrounding area and cause visual intrusion. This will be of a low magnitude and will only occur during construction phase.

Mitigation

- Regular site clean-up to prevent littering
- All excavated material should be compacted to minimize soil erosion
- Restrict project activities to the actual project site
- Establishment of a site store for storage of materials, tools and equipment

5.2.2 Negative Social impacts during construction phase

5.2.2.1 Occupational Health and Safety Hazards

During construction the movement of construction materials may result in accidents if good supervision is not provided. Accidental cuts and bruises are common among construction workers as a result of the use of machinery and hand tools, an impact that needs due consideration.

Mitigation:

- Provide appropriate personal protective equipment (PPE).
- Implement a programme of assessment of routine monitoring of worker health.
- Redesign manual processes and rotate work tasks to reduce heavy lifting/repetitive activities, and where possible install mechanical lifting aids.
- Train workers in general safety procedures including first aid and fire safety.
- Use designated routes for machinery and personnel
- Engineer out sharp edges and access to dangerous parts of machinery through a hierarchy of controls (permanently fixed physical barrier, interlocked physical barrier, physical barrier, presence sensing system).
- Ensure that there are provisions for reporting incidents, accidents and dangerous occurrences

5.2.2.2 Labour Influx Effects

During construction the project will attract jobseekers and hawkers with possibility of thieves intruding into the area. This therefore leads to concentration of people in one area drawn from diverse social and cultural backgrounds often resulting to a number of issues as listed below;

- Strain on various resources especially water resources
- Grievances from local community members over job opportunities
- Sexual Exploitation and Abuse
- Unwanted Pregnancies

To mitigate against possible social ills associated with labour influx during construction phase and conflicts thereof, the contractor will adhere to the following mitigation plan;

Mitigation measures to Labour Influxes

- The contractor awarded the Project will develop a labour Management Plan (LMP) in consultation with local leaders.
- The contractor will ensure effective community engagement and strong grievance mechanisms on matters related to labour, with a discrete mechanism for safely and confidentially reporting issues of SEA and GBV at the community level triggered by the Project
- Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx, the contractor should engage a local community liaison person who is also trained in PSEA.
- The contractor will ensure proper records of labour force on site while avoiding child and forced labour
- The contractor will ensure comply to provisions of Workplace Injuries and Benefits Act (WIBA) 2007
- The contractor will develop and implement a children Protection Strategy, this strategy will ensure that no child under the legal age of 18 years in employed to the Project.

- The contactor should institute a security plan e.g. through a register for all visitors and workers.
- The contractor will Adopt and adapt Nyumba Kumi strategies

5.2.2.3 Increased Spread of STD, HIV & AIDS

There is likely increase in incidences of health impacts such as sexually transmitted diseases including HIV & AIDS especially during construction of the project. Possible illicit behaviours such as prostitution may increase in the centre leading to spread of STD, HIV/AIDS due to influx of workers and perceived 'quick money' from the sub-project albeit on a smaller scale.

Mitigation

The following should be implemented to mitigate sspread of STD, HIV & AIDS:

- Contractor to develop appropriate awareness content and implement awareness sessions for workers on HIV/AIDs and other STDs. This can be done through the use of educative posters and tool box meetings.
- Ensure an adequate and accessible provision of condoms to workers both male and female.
- Contractors to develop a code of conduct and ensure it's signed by all workers with physical presence on site as well as within the project area.

5.2.2.4 Increased Spread of COVID-19

The construction activities will introduce new workers to the site increasing the risk of contracting and spreading COVID-19 from workers who could be infected with the virus. Due to the current spread of COVID-19 which has become a pandemic, if not well mitigated this impact may be high.

Mitigation

The project contractor to establish prevention and mitigation measures against COVID-19 and arrangements for dealing with suspected and confirmed COVID-19 cases. The measures should include but not limited to;

- Raise awareness on the need to take COVID-19 vaccine,
- Ensuring social distancing of not less 1.5 meters between employees in all directions
- Hygiene promotion through use of suitable hand sanitizers or handwashing with soap and water
- Strict and proper use of face masks throughout all working hours and public places.
- Implement Ministry of Health guidelines for staff safety and health, including daily temperature checks for everyone in the workplace
- Increase frequency of disinfecting commonly touched surfaces/objects

5.2.2.5 Gender Based Violence(GBV) and Sexual Harassment

This impact is triggered during project construction phase when the contractor fails to comply with the gender inclusivity requirements in hiring of workers and entire project management as per required by Gender Policy 2011 and 2/3 gender rule.

Mitigation

- Ensure clear human resources policy against sexual harassment that is aligned with national law
- Integrate provisions related to sexual harassment in the employee COC
- Ensure appointed human resources personnel to manage reports of sexual harassment according to policy
- The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse
- The contractor will implement provisions that ensure that gender -based violence at the community level is not triggered by the Project, including:
- Effective and on-going community engagement and consultation, particularly with women and girls;
- 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.

5.2.2.6 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

- Given that the project will be smaller in nature, it is anticipated that the mitigation will be through management and coordination to include 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.

5.2.2.7 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

- The contractor will develop and implement a Children Protection Strategy that will ensures 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.

- Refrain from hiring children for domestic or other labour, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.

5.2.2.8 Loss and or destruction of cultural property

This include the impacts of the project on any known cultural or archaeological site.

Mitigation Measures

- ✓ *The current site is not in known heritage site. However, during construction in case of any discovery, the site will have to be enclosed and protected*
- ✓ *The contractor must ensure that any materials found which may be of archaeological value must be handed over to a professional archaeologist for analysis and further disturbance of the area must be stopped.*

5.3 Environmental and Social Impacts and Mitigation Measures during Operational Phase

5.3.1 Positive environmental impacts during operational phase

It is anticipated that the operations phase of this project will result in:

i. An improvement in the standard of living of the beneficiary residents.

reduction in the distances traveled and time spent in search of water, especially for women. This would in turn allow them to spend their energy and time on economically and socially viable activities for their families;

ii. Reduction in water related conflicts

iv. Food, nutritional and livelihoods security.

v. Improved water availability even during the dry season

5.3.2 Negative environmental impacts during operation phase

5.3.2.1 Loss of biodiversity

Due to increased human activities during operation, biodiversity may be affected. Excavated soils may cover vegetation leading to loss of habitats.

Mitigation measures

- *Only critically affected vegetation by the projects should be removed and reestablished later*
- *Fence off and replant trees and grass around the water pan.*
- *Protect sensitive vegetation from soils excavated*

5.3.2.2 Water quality nitrate pollution by livestock dung and use of fertilizers upstream

Livestock if they access the water from the reservoir may deposit dung and lead to nitrate pollution. Workers may also wash in the pan water and children may start swimming in the pan. Use of fertilizers upstream in catchment areas may also contaminate the water. All these affect the water quality and compromise health of water users. Livestock may also contaminate the water or objects may be thrown into the pond

Mitigation measures

- *Livestock should not be allowed to drink water directly from the reservoir at any time.*
- *By laws should take care of water quality issues associated with livestock and children*
- *Train on safe use of organic fertilizers that are biodegradable*

5.3.2.3 Siltation

This may be caused by soil eroded from the catchment area that is usually bare during dry season. The runoff may transport the dung and debris from the catchment into the reservoir. Poor workmanship or failure to maintain the sedimentation ponds may lead to excessive siltation in the pan.

Mitigation measures

A silt trap will be constructed to reduce the amount of soil that is transported into the pan. Reduced silt levels will prolong the lifespan of the pan. Construction of silt trap will involve clearing of vegetation over a surface area and excavating a depth of 2m. This will create a volume of spoils that would require to be disposed off appropriately. The silt volume expected per year is 1,400m3 and hence adopts a standard silt trap of capacity 20m by 30m by 2m depth.

i, Soil conservation should be addressed seriously and silt-trapping facilities maintained.

ii By-laws to ensure operation and maintenance.

iii. Training project group members on maintenance of the facility.

iv Use of the recommended materials and skilled labor for technical work.

5.3.2.4 Increased incidences of malaria

Due to mass water body which is stagnant there are high chances of mosquitoes breeding in the water pan hence increased incidences of malaria

Proposed Mitigation

i Provision of mosquito nets to the people residing around the pan area

ii clearing of bushes around the pan

5.3.3 Negative social impacts during operational phase

5.3.3.1 Leadership issues in management

During operation, the management of the group will be exposed to the group increased income levels. As such, there will be tendency to mismanage funds meant for group advancement/development due to personal interests. This may limit the group growth and risk membership loss.

Mitigation:

- Capacity building to the management committee should be undertaken periodically by KCSAP
- The management of funds should be handled by dully elected finance committee with appropriate gender representation.
- There should be periodic update to the members on the incomes received and the expenditure to enhance transparency and confidence in the committee.

5.3.3.2 Occupational Health and Safety Issues

Health issues are a major concern globally; therefore, hazards associated with diseases must be dealt with. Safety may be compromised when children play around the reservoir. The operation of the facility is likely to result in the following.

- ✓ *Increased movement of human leading to congestion on the available paths and walk-ways which will cause soil erosion in the long run.*
- ✓ *Accidental falls into the pan.*
- ✓ *Consumption of water before treatment*
- ✓ *Breeding of mosquito from the stagnant water*

Mitigation measures

- *Construct the facilities as per the recommended plans that include fencing, toilets and water pumping site access steps to the reservoir and paths among others.*
- *Develop By-laws that are acceptable to all.*
- *Train the group members on water use efficiency with conservation aspects being integrated.*
- *Restrict livestock and human movement inside the reservoir by fencing the site.*
- *Allocate designated water collection points outside the pan*

5.3.3.3 Introduction of vector borne diseases

Some of the most common vector borne diseases includes bilharzias, typhoid and dysentery.

Mitigation Measures

- *Promote primary health care practices, with the assistance of the Ministry of Health;*
- *Monitor the presence of disease vectors*
- *Contribute to strengthening of local health facilities through public enlightenment*
- *Contribute to public health programmes to eradicate/protect against malaria, schistosomiasis*
- *Enhance community animal spraying and immunization programmes*

5.3.3.4 Water Demand Conflicts

During the dry seasons water volume reduces and members may seek more water for livestock purposes which could lead to conflicts among users of the water pan. Also livestock keepers may want to water their cattle, farmers will want to irrigate their crops. And Fish will have to be maintained in the pan

5.3.3.5 Mitigation measures

- *Schedule should be set for reduced water use during the dry season*
- *By laws should be followed and enforced.*
- *Penalties and fines should be introduced*

5.3.3.6 Spread of COVID-19

The potential for the spread of any infectious disease like COVID-19 is high. The project operational activities will involve among others water distribution to minimise concentration around watering points, planting of trees agroforestry. There is also the risk that the project

may experience large numbers of community becoming ill and will need to consider how they will receive treatment, and whether this will impact on local healthcare services

Mitigation

The project management committee will develop SOPs for managing the spread of Covid-19 during project operations. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions; -

i Ensure all County staff are vaccinated against COVID-19 and sensitize farmers to take up the vaccine

ii Avoid concentrating of more than 15 persons or workers at one location. Where more than one person is gathered, maintain social distancing of at least 2 meters

iii The project shall put in place means to support rapid testing of suspected workers for covid-19;

iv Install handwashing facilities with adequate running water and soap, or sanitizing facilities at AI clinic venues and meetings and ensure they are used;

v Ensure routine sanitization of shared social facilities and other communal places routinely

5.3.3.7 Gender Based violence and Sexual Harassment

While such cases are difficult to assess, there is likelihood of rape cases during project operations. This impact is triggered during project operation phase when the project management unit fails to comply with the Gender Inclusivity requirements in entire project management team as required by Gender Policy 2011 and 2/3 gender rule.

Mitigation

- Integrate provisions related to sexual harassment in the employee COC in project management committee
- The Project management committee in collaboration with county department of social services will implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: effective and on-going community engagement and consultation, particularly with women and girls; review of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes; employment schemes for women
- The project management committee in collaboration with county department of social services shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment; etc.
- The project management committee will ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project management unit.

5.3.3.8 Sexual Exploitation and Abuse (SEA)

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

Mitigation

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 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;

II 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;

5.4 Negative Environmental and Social Impacts during Decommissioning Phase and Mitigation Measures

5.4.1 Negative environmental impacts during decommissioning phase

5.4.1.1 Oil spills/Fuels and Lubricants

Oils and grease spillage on the ground may cause contamination to the soil and groundwater. Proposed mitigation and management measures are:

I Proper maintenance of vehicles and other equipment (using petroleum products) to avoid fuels and lubricants spills at the project site.

II The proponent should properly handle, storage, and disposal off oils and greases and their wastes during decommissioning by ensuring that servicing is strictly done at designated servicing yard or external petroleum stations

Increased generation of solid wastes

Decommissioning activities will generate various solid wastes ranging from debris, wrappings, concrete, human wastes to food wastes etc. Poor handling and disposal of such waste will lead to environmental pollution.

Mitigation:

I Careful dismantling to ensure materials remain as re-usable as possible

II Selling or donating the re-usable or recyclable materials to avoid waste

III Cleaning and proper site rehabilitation by adhering to a NEMA approved Decommissioning plan

5.4.1.2 Loss of livelihood

During project operation there will be income generated from undertaking artificial insemination, sell of improved breeds and milk production. The income is expected to reduce following termination of the AI project.

Mitigation

I The impact is low as it is anticipated and can be mitigated by training farmers on other forms of business and other strategies for continuous improvement of local breeds.

6 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESM&MP)

6.1 Introduction

Along with the potential impacts presented in this chapter, proposed mitigation measures and monitoring aspects have also been highlighted for appropriate action. Some impact mitigation has already been proactively addressed in the design, while others would be undertaken through considered incorporation in the implementation of the project and guided by the environmental management and Monitoring plan (ESMMP) developed under this report. The ESMMP provides a general outlay of the activities, associated impacts, mitigation action plans and appropriate monitor able indicators. Implementation timeframes and responsibilities are also defined.

The responsibility for the integration of the mitigation measures for the proposed development lies with the Contractor during the construction stage while the project management unit takes over the duty upon commissioning of the project. At every stage, the objective would be to ensure that the specified mitigation measures are implemented.

6.2 6.1 Environmental Social Management& Monitoring Plan

The scope of this environmental social management and monitoring plan (ESMMP) document is to give guidelines to all parties involved in construction, maintenance and utilization of the water pan in fulfillment of environmental and social requirements. The management plan has a long-term objective to ensure that:

i. Environmental management conditions and requirements are implemented from the start of the project and post construction period, and
ii. Precautions against damage to environment and property and claims arising from damages are compensated expeditiously.

The tables below therefore summarize the Environmental Social Management and monitoring Plan for this project. They describe the parameters that can be monitored, and suggests how monitoring should be done, how frequently, and who should be responsible for monitoring and action

Tables 6-1 form the core of this ESM&MP for the construction, operational and decommissioning phases of the proposed rehabilitation and expansion of the water pan sub-project. In general, the tables outline the potential environmental, socio-economic, health and safety risks associated with the project and details all the necessary mitigation measures, their financial costs, as well as the persons responsible for their implementation and monitoring. The ESM&MP should be used as checklist in the initial environmental audit of the project.

Table 6-1: Environmental and Social Management and Monitoring Plan (ESM&MP)

Potential Impact	Proposed Mitigation Measures	Responsibility	Timeline	Performance Monitoring Indicator	Means of Verifiable	Cost (Ksh)
Construction phase						
Loss of vegetation	• only clear enough area for the pan expansion • Mature trees should not be cut unless extremely necessary. • Plant indigenous palatable plant species around the project site	Contractor	Continuous during Construction	• Number of indigenous palatable species planted • Acreage of grass cover on the embankments	• reports/photographs • -Site plan showing vegetation clearance	Contractor cost 50,000
Soil erosion	• All excavation works must be properly backfilled and compacted • Construction of check dams • Construction of gabions along the hotspots • Promote agroforestry upstream	Contractor/Project management unit	Continuous	• Length of gabions constructed • Acreage coverage of trees planted upstream	• Reports • Filed visits	50,000
Increased noise and vibration generation	• Ensure PPE such as ear muffs are provided to the workers where necessary • Construction work be done during the day when people are away and also the outside environment is also noisy. • Ensure that the machines are serviced promptly as required	Contractor	Continuous during Construction	• No of PPE provided to workers • No. of cases reported relating to noise pollution	• Noise Levels • Duration/time of the day • Reports	Contractor cost
Air Quality Degradation due to dust and exhaust emissions	✓ Minimize emission of exhaust fumes through servicing of machinery in use ✓ Use only heavy machinery and equipment during daytime ✓ Regular servicing of equipment	Contractor	Continuous during Construction	• No of Workers/vehicle operators sensitized on reduced emission • No. of PPE supplied	-site visit /reports Photographs Sensitization meeting report	Contractor cost

Oil spills/Fuels and Lubricants	✓ Vehicle maintenance should be done on purpose built • Impervious concrete platforms with oil and grease traps. • Standard operating practices for re-fueling mobile equipment such as a minimum 15m from any water channel should be practiced	Contractor	Construction phase	• No of Oil and grease traps established	• Records Register on vehicle maintenance	Contractor cost
Increased generation of solid wastes	• The base camp of the contractor should not be in the catchment area of the water pan. • appropriately • Recycle any useful material during water pan excavation phase • Use of an integrated solid waste management system i.e., the 3 R's: 1. Reduction at source 2. Reuse 3. Recycle where possible. • Reuse packaging materials such as cartons, cement bags, empty metal and plastic containers to reduce waste at site; • Waste collection bins / receptacles to be provided at the project site	Contractor Site Engineer	Continuous during Construction	• No. of waste bins/receptacle • Quantity of Waste • No of designated waste collection points	• Type of waste Designed waste collection points established • Waste collection company engaged	Contractor cost
Visual Impacts and aesthetics	• Regular site clean-up to prevent littering • All excavated material should be compacted to minimize soil erosion • Restrict project activities to the actual project site • Establishment of a site store for storage of materials, tools and equipment	Contractor	Throughout the construction phase	• Volume of waste cleaned up • Area compacted • Number and size of materials stores erected • Area of site rehabilitated	• Cleaning up of waste • Compacting loose soils • Establishment of a materials store • Site rehabilitation	Contractor cost
Occupational Health and safety Hazards	• Provide workers with appropriate personal protective clothing: helmets, boots and overalls	Contractor/Project management unit	Continuous during construction	• No. of HSE trainings • No. PPE provided	• PPE provided • Recorded accidents occurrences and near misses	100,000

	• Implement a programme of assessment of routine monitoring of worker health**.** • Redesign manual processes and rotate work tasks to reduce heavy lifting/repetitive activities, and where possible install mechanical lifting aids. ✓ Provide a well-stocked first aid kits on the site • Restrict livestock and human movement inside the reservoir by fencing the site.			• First Aid Kits availability • Availability of sanitation facility • No. of Accidents/ incidents	• OSH sensitization conducted • Field visits	
	Social Impacts					
Increased Spread of STD, HIV & AIDS,	• Community sensitization on HIV/AIDs • Contractor to sensitive workers and provide condoms on site as well as within the project area.	Contractor /Project management committee	Throughout construction Period	• No of Cartons of condoms distributed and to the relevant persons • No. of HIV trainings and awareness campaign • Code of Conduct	• Reports •	20,000
Increased Spread of COVID-19	• Raise awareness on the need to take COVID-19 vaccine, • Ensuring social distancing of not less 1.5 meters between employees in all directions, • Hygiene promotion through suitable hand sanitizing facility or handwashing soap and water • Strict and proper use of face masks throughout all working hours and public places.	Contractor/ Project management committee	Throughout construction Period	• Number of Handwashing facilities/sanitizers • No. of appropriate PPE (Face Masks) distributed • No. of trainings • Vaccinations undertaken	• Incidences reported • Reusable phase masks distributed • Hand washing facilities • Observance of social distance	30,000

	• Implement Ministry of Health guidelines for staff safety and health, including daily temperature checks for everyone in the workplace • Increase frequency of cleaning commonly touched surfaces / objects			• No. of Covid-19 incidences reported • Number of persons working at the site		
Gender based violence and sexual harassment	• Integrate provisions related to sexual harassment in the employee COC • The Contractor to ensure compliance with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse Community and construction workers awareness on GBV • Separate toilets for each gender • Establishment of appropriate grievance redress mechanisms	Contractor/project management unit	Throughout construction Period	• No. of cases of GBV reported • Number of sensitization workshops	• Human resource policy in place • Code of Conducts signed • Separate sanitary convenience	20,000
Child abuse	• Contractor develop and implement a Children Protection Strategy • All staff signing and 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.	Contractor/Project management unit	During construction	• Number of school going children who have dropped out of school • Number of workers to have ratified to child protection strategy • No. of children/persons below the age of 18 yrs employed	• Child Protection Strategy • Workers signing and committing to child protection strategy • Age of employees	20,000
					Sub-Total	**240,000**
Operation phase Environmental impacts						

Siltation	• Construct silt trap, clearing of vegetation over a surface area and excavating a depth of 2m • Silt-trapping facilities maintained. • Establishment of tree nursery • Establishment of agroforestry within surround farms upstream	Proponent Achar self-help group	Throughout operation	• One check dam or silt trap • Number of established agroforestry farms upstream	Operational silt trap Agroforestry farms established Reports Field visits/observation	150,000
Solid Waste generation from pan operation	• Use of an integrated solid waste management system i.e., the 3 R's: 1. Reduction at source 2. Reuse 3. Recycle where possible. • Reuse packaging materials such as cartons, cement bags, empty metal and plastic containers to reduce waste at site; • Waste collection bins / receptacles to be provided at the project site	Proponent Achar self-help group	Throughout operation	• No of Designed waste collection points established • • -No of Waste collection companies engaged	• Waste storage points • • • • -Waste disposal facilities/contract collector	50,000
Population Pressure and Water Demand for livestock, domestic, irrigation and fish farming	• Develop schedule on water use for irrigation, domestic and livestock • Local community bylaws should be established on water use • Payment for water use so that funds can be used to sustain the pan	Proponent Achar self-help group	Throughout operation	• Number of livestock watering points • Number of Domestic water collection points • Bylaws established on water extraction	• Reports • Field observation	30,000
Water quality nitrate pollution by livestock dung and use of fertilizers upstream	• Livestock should not be allowed to drink water directly from the reservoir at any time. • By laws should take care of water quality issues associated with livestock and children • Train on safe use of organic fertilizers that are biodegradable	Proponent Proponent Achar self help group	Throughout operation	• Length of pan perimeter fencing • No of livestock water troughs • Number of farmers trained	• Reports • Field observation • Farmers practising organic farming	50,000

				on use of organic fertilizers		
Oil spills	• Standard operating practices for application of oils lubricants on mobile equipment to be a minimum 15m from any water course/ channel should be practiced	Proponent Achar self help group group	Throughout operation	• Amount of Oil and grease traps used	• Records Register on machinery maintenance	
Possible breeding of disease causing vector due to the presence of the pan Increase in water borne and other related diseases	• Provision of treated nets to the targeted communities -Equip health centres with drugs • -Provision of water treatment tablets	Proponent Achar self help group group	Throughout operation	• Number of targeted households provided with Mosquito nets, • Water treatment tablets and sensitized	• Reports	100,000
Operation phase Social impacts						
Leadership issues in management	• Periodical capacity building to the PMC by KCSAP • Elected finance committee with appropriate gender representation to handle funds. • Periodic update to the members financial status- transparency	Proponent Achar self-help group	Throughout operation	• Number of trainings conducted • Number of meetings held • No of reported grievances • Periodic financial status updating	• Training of PMCs • GRM mechanisms • Periodic financial status update	10,000
Conflicts on water use	✓ Establish a grievance redress mechanism targeting communities and other project stakeholders but not ✓ Ensure the grievance redress mechanism is available to the affected community members and stakeholders at no cost	Proponent Achar self-help group	Continuous	Number of reported cases on grievances Number of sensitization awareness creation workshops on GRM	Reports • Existing records	20,000

	• Educate all project stakeholders on the availability and use of the grievance redress mechanism in a manner that is understandable to all,			• Number of community members trained on GRM		
Occupational Health and safety Hazards	✓ Provide workers with appropriate personal protective clothing: helmets, boots and overalls. ✓ Provide a well-stocked first aid kits on the site ✓ Restrict livestock and human movement inside the reservoir by fencing the site. ✓ Put Signage (Warning signs in strategic sites)	Proponent Achar self-help group	Throughout operation	• No. of accidents reported • Number and types of PPE procured • No. of sensitization meetings	• Reports on Safety records • Reports on number first Aid Kits available • Photos of signage sites	100,000
Spread of Covid 19	• Sensitize the Achar water pan users and county staff to take up COVID-19 vaccine • Avoid concentrating of more than 15 persons or workers at one location. Where more than one person is gathered, maintain social distancing of at least 2 meters • The project shall put in place means to support rapid testing of suspected workers for covid-19; • Install appropriate handwashing at designated locations; • Ensure routine sanitization of shared social facilities and other communal places routinely	Proponent Achar self-help group	Throughout operation Period	• Presence of Handwashing facilities/sanitizers • No. of appropriate PPE (Face Masks) distributed • No. of trainings/sensitization • Number of mem • No. of Covid-19 incidences reported at offices	• Incidences reported • Reusable phase masks distributed • Hand washing facilities • Observance of social distance	50,000
GBV and Sexual harassment	• Integrate provisions related to sexual harassment in the employee COC in project management commitee	Proponent Achar self-help group	Throughout operation period	• Number of recorded cases	• Code of Conducts signed	20,000

	• PMC in collaboration with county department of social services ensure that gender-based violence at the community level is not triggered by the Project • The project management committee will ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project management unit.			• Number of sensitization workshops • Human resource policy	• No. of cases of GBV reported	
Sexual exploitation and Abuse (SEA)	• Response to SEA: including survivor-centred 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;	Proponent Achar self-help group	Throughout operation phase	• Number of recorded cases • Number of sensitization workshops • Human resource policy •	• Code of Conducts signed • No. of cases of GBV reported	20,000
					Sub-Total	**590,000**
Decommissioning phase						

Air Quality Degradation due to dust and exhaust emissions	▪ Workers engaged in decommissioning should be provided with appropriate PPE ▪ Sprinkle water on uneven/bare areas at project site areas and nearby access roads to minimise dust	Contractor	Continuous during decommissioning	• No. of workers sensitized • PPE provided • Frequency of watering	• Workers/vehicle operators sensitized on reduced emission • PPE provided to workers • Sprinkling of water •	30,000
Increased generation of solid wastes	• Careful dismantling to ensure materials remain as re-usable as possible • Selling or donating the re-usable or recyclable materials to avoid waste • Cleaning and proper site rehabilitation by adhering to a NEMA approved Decommissioning plan	Contractor	• Continuous during decommissioning	• Recycling solid waste • Rehabilitated site • Designed waste collection points established • Waste collection company engaged	• Quantity of waste • Area rehabilitated • No. of solid waste bins/receptacles • Type of Waste	30,000
Loss of livelihood	• The impact is low as it is anticipated and can be mitigated by training farmers on other forms of business and other strategies for continuous improvement of local breeds	Proponent	Continuous during decommissioning	• Training on alternative business	• No. of trainings conducted	20,000
Occupational Health and Safety Hazards	• Provide appropriate personal protective equipment (PPE). • Train workers in general safety procedures including first aid and fire safety. • Use designated routes for machinery and personnel • Ensure that there are provisions for reporting incidents, accidents and dangerous occurrences	Contractor	Continuous during decommissioning	• Training of workers on safety • Provision of PPEs • Install first aid kits • Reporting of incidents • Set up sanitation facilities • Designated routes for	• No. of HSE trainings • Number of PPEs provided • First Aid Kits availability • No. of Accidents/incidents • Existence of routes for machines and personnel	30,000

				machinery and personnel		
Spread of COVID-19 amongst workers	• Provision and use of appropriate Personal Protective Equipment (PPE) • Maintain social distancing at least 2 meters • Install handwashing facilities with adequate running water and soap, or sanitizing facilities	Contractor	Continuous during decommissioning	• Availability of SOP(s), Training material, PPE, sanitising facilities etc;	• No. of PPEs provided/procured • No. of handwashing facilities installed • Number of COVID-19 cases reported	30,000
					Sub-Total	**140,000**
Total Cost of ESM&MP(Kshs)						**650,000**

7 CONCLUSION AND RECOMMENDATION

7.1 Conclusions

From an environmental point of view, the project poses minimal negative impacts especially due to its size and normal impacts associated with any excavation works. The negative impacts were found to be of low magnitude and can be easily mitigated at minimal costs or cost free. On the other hand, the positive impacts of the project are mainly socio economic and would contribute immensely towards the achievement of vision 2030 objectives of wealth creation, income generation and poverty reduction within the rural communities of Kenya. The potential negative impacts of the project are low, easy to mitigate, and the benefits to the community are very significant. In addition, if the proponent and the community undertake the necessary measures to mitigate the negative impacts as identified in this report, then there should be no reason to prevent the project from proceeding on as planned.

7.2 Recommendations

Achar Pan has the potential to have multiple benefits to the community and the surrounding areas. The positive impacts of the project far out ways the negative impacts of the project.

- To ensure environmental sustainable development, the following recommendations should be considered for implementation.
- All materials from the demolished existing bond to be reused maximally and if unusable the materials to be disposed according to the existing rules and regulations
- The dam project will lead to improved water accessibility and security at community level, the few negative impacts identified have been adequately mitigated through diverse measures proposed in the ESMP and thus we recommend that the project be considered for an ESIA clearance and subsequent implementation
- The local area administration to guide in providing community policing especially during project operation period for avoidance of influx of other communities which could be a potential source of conflict and the current ravaging Covid 19 pandemic
- Finally the potential negative impacts of the project are low, easy to mitigate and the benefits to the community are very significant. If the proponent and beneficiaries undertake the necessary measures to mitigate the negative impacts as identified and recommended in the EMP, then there should be no reason to prevent the project from proceeding on as planned.

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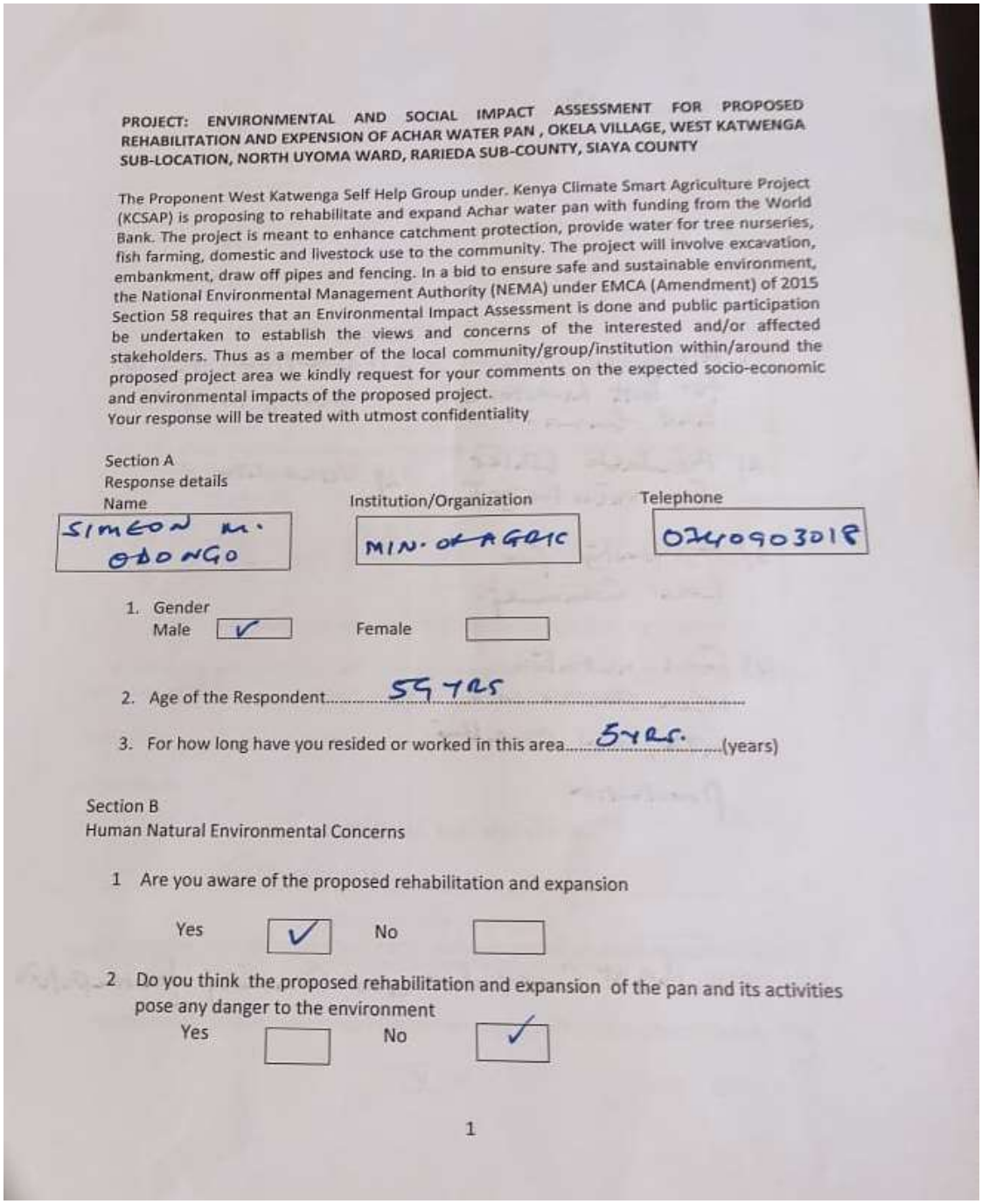
9 APPENDICES

i) Copies of filled questionnaires



PROJECT: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR PROPOSED REHABILITATION AND EXPENSION OF ACHAR WATER PAN , OKELA VILLAGE, WEST KATWENGA SUB-LOCATION, NORTH UYOMA WARD, RARIEDA SUB-COUNTY, SIAYA COUNTY

The Proponent West Katwenga Self Help Group under. Kenya Climate Smart Agriculture Project (KCSAP) is proposing to rehabilitate and expand Achar water pan with funding from the World Bank. The project is meant to enhance catchment protection, provide water for tree nurseries, fish farming, domestic and livestock use to the community. The project will involve excavation, embankment, draw off pipes and fencing. In a bid to ensure safe and sustainable environment, the National Environmental Management Authority (NEMA) under EMCA (Amendment) of 2015 Section 58 requires that an Environmental Impact Assessment is done and public participation be undertaken to establish the views and concerns of the interested and/or affected stakeholders. Thus as a member of the local community/group/institution within/around the proposed project area we kindly request for your comments on the expected socio-economic and environmental impacts of the proposed project.
Your response will be treated with utmost confidentiality

Section A
Response details

Name	Institution/Organization	Telephone
SIMEON M. ODONGO	MIN. OF AGRIC	0740903018

1. Gender
   Male [✓] Female [ ]
2. Age of the Respondent 54 YRS
3. For how long have you resided or worked in this area 54 YRS. (years)

Section B
Human Natural Environmental Concerns

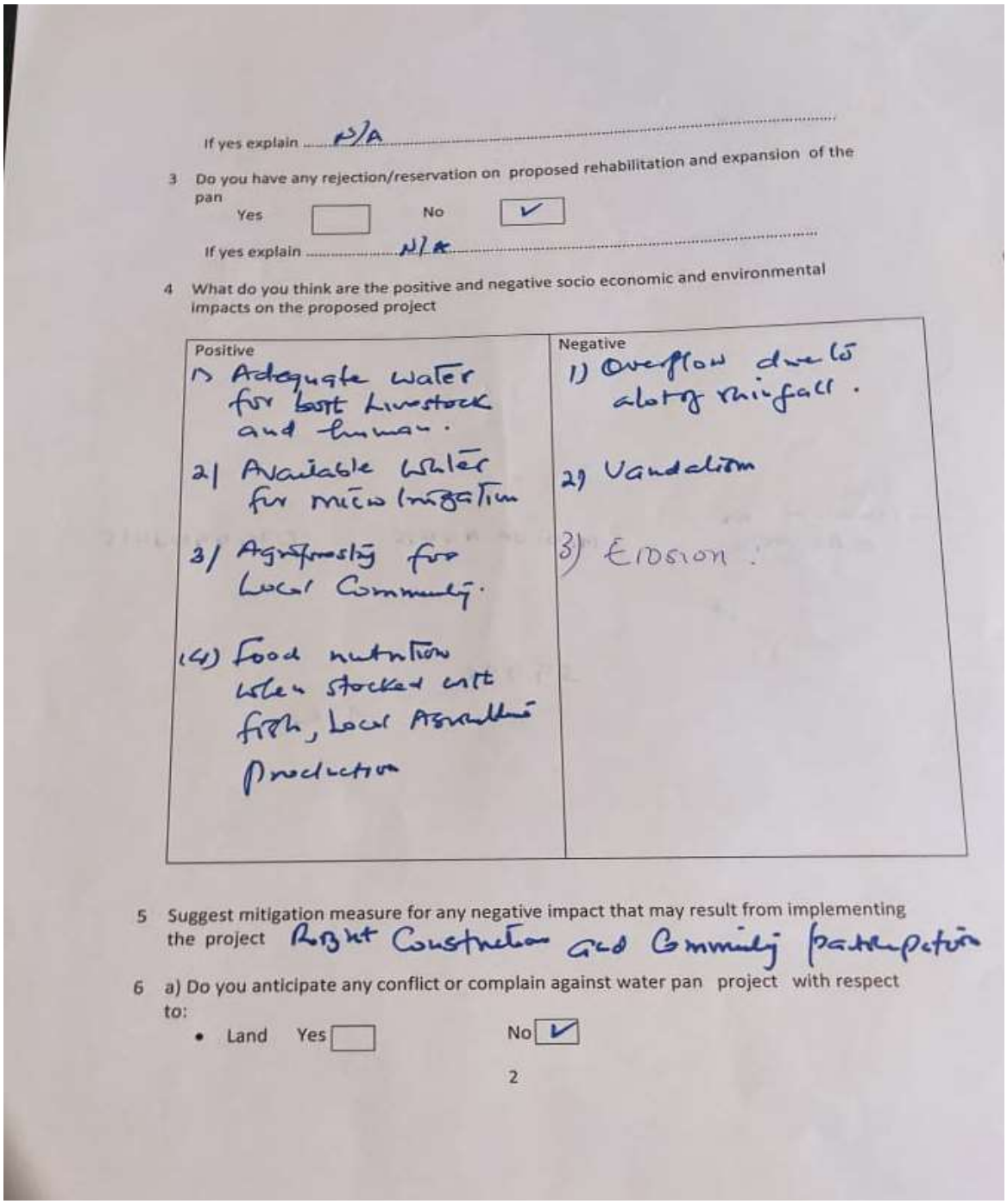
1 Are you aware of the proposed rehabilitation and expansion

Yes [✓] No [ ]

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

Yes [ ] No [✓]

1



If yes explain N/A

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

Yes ☐ No ☑

If yes explain N/A

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

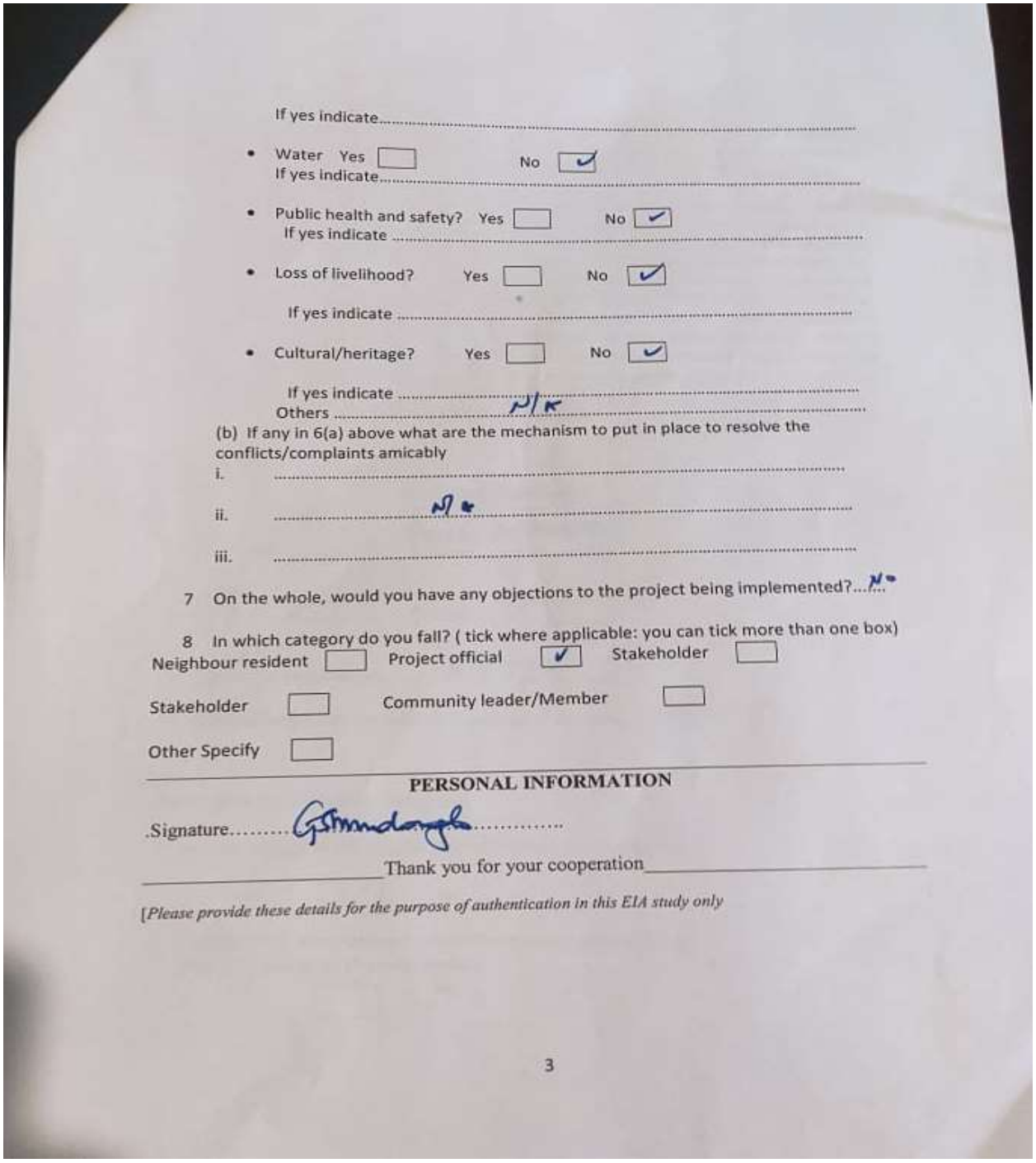
Positive	Negative
1) Adequate water for both Livestock and human.	1) Overflow due to along rainfall.
2) Available water for micro irrigation	2) Vandalism
3) Agroforestry for Local Community.	3) Erosion.
(4) Food nutrition when stocked with fish, Local Agricultural Production	

5 Suggest mitigation measure for any negative impact that may result from implementing the project Right Construction and Community participation

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

- Land Yes ☐ No ☑

2



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 ..... N/A

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

i. .....

ii. ..... N/A

iii. .....

7 On the whole, would you have any objections to the project being implemented?... No

8 In which category do you fall? (tick where applicable: you can tick more than one box)

Neighbour resident ☐ Project official ☑ Stakeholder ☐

Stakeholder ☐ Community leader/Member ☐

Other Specify ☐

PERSONAL INFORMATION

Signature..... .....

Thank you for your cooperation

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

3

ii) Minutes of public consultation meeting

MINUTES OF ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) PUBLIC MEETING FOR THE PROPOSED REHABITATION AND EXPANSION OF ACHAR WATER PAN IN NORTH UYOMA WARD, RARIEDA SUB-COUNTY IN SIAYA COUNTY HELD ON 8th NOVEMBER 2021 AT OKELA VILLAGE, AT 09:45 AM.

MEMBERS PRESENT
Attached as an Appendix – List of Participants

AGENDA
Introductions and opening remarks
Purpose of the meeting
Rehabilitation and Expansion of Achar ' water pan sub-project Brief
Concerns, Questions and Responses
A.O.B. & adjournment

PRELIMINARY
The meeting started with a word of prayer from the proposed pan chairman Dan Oguna Ochung at 10:00hrs. The meeting was held at the proposed site in Okela village on 8th November, 2021. A total of 40 members attended the Environmental Social Impact Assessment (ESIA) public meeting. The area Chief Mr Esau Okoth Oduru welcomed the visitors from Siaya Kenya Climate Smart Agriculture office and Nairobi and expressed their happiness for receiving the visitors again. He then introduced the County Project Coordinator for KCSAP

MIN. 1 - 11/8/2021: INTRODUCTION & OPENING REMARKS
The project coordinator Siaya County Mr Ating Willis welcomed the attendants for a round of introductions starting by highlighting the need to put in place measures for covid-19 prevention by adhering to Ministry of Health guidelines that included wearing of appropriate masks, washing hands regularly or using alcohol based sanitizer and social distancing. The Kenya Climate Smart Agriculture Project (KCSAP) County Environment and Social Safeguard Officer (CESSCO) Benard Ayagah introduced himself. This was followed by introductions from the ESIA consultants and the pan management committee officials

MIN. 2 – 11/8/2021: PROJECT BRIEF
The CESSCO reminded the community of the last visit the team had paid to the community during the feasibility study and design mission. He gave a brief highlight on the objective of the visit and the need to conduct an Environmental Social Impact Assessment on the proposed Achar water pan Project He at the same time briefed them on their proposal of how to undertake selective bush clearing during opening up of land for the water pan construction. He further narrated the importance of the Environmental Social Impact Assessment and

that the proposed project was a rehabilitation and expansion of Achar ' water pan comprising of; clearing of vegetation , fencing, excavation, Construction of auxiliary structures (water tank, livestock trough, silt traps, check dams, spillway, water kiosk), There will be Horticulture Production (water tank, shade nets, horticulture seed, agrochemical. Along the catchment areas there will be check dams, agroforestry, cross slope barriers. Fish will be stocked in pan and a tree nursery will be established where seedlings can be grown and sold out. A water tank will be installed and water will be pumped by means of solar energy and water will be piped through gravity to the farms. (Shade, tank, pipes, seeds, tools and equipment). He emphasized that the project will be owned by the community and the need for the active involvement of members.

MIN. 3 - 11/8/2021: PURPOSE OF THE MEETING

The ESIA expert enlightened the meeting 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/neighbours/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

The main objective of the consultation meeting was to

Gather comments, suggestions and concerns of the interested and affected parties in the proposed project, and incorporate them in the summary project report (SPR).

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

Min 4- 11/8/2021: 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

1 Indicate whether he or she is aware of the proposed bush water pan construction and its related activities incidental thereto and connected therewith the under the Resilience Project? Yes/No
2.Give opinion on the expected benefits from the water pan project
3.Give opinion on the anticipated negative/adverse impacts that may result from this project and related activities
4. Propose mitigation measures to avoid, alleviate or reduce the adverse effects
5. Identify any conflict, complaints expected to arise due water pan construction
6. Suggest ways to resolve conflict, complain amicably
7. Indicate other issues relevant to the implementation of the water pan project

MIN. 4 –11/8/2021: POSITIVE IMPACTS ANTICIPATED BY MEMBERS FROM THE MEETING

Mr Phillip Otieno Informed the meeting that use of renewable energy to generate power is a key priority option . The use of solar energy would mitigate unnecessary emissions and reduce cost of purchasing fuel to pump water from the pan.

Mr Samson the sub county agricultural officer informed the members that the proposed pan has a potential of irrigating high value horticultural crops that can be sold at Bondo and Madiany centre. Simeon a community youth member who is also the secretary to the water pan management committee reported that there will be employment creation. The project will open

avenues for the youth to grow high value food food crops under irrigation. It will also cushion livestock keepers from the recurring droughts and frequent movement in search of water

Phillip Otieno Akumu : welcomed the project but was skeptical on application of the solar pumps. His concern was that solar may be fluctuating hence low production of water for domestic, irrigation and livestock use

Jane Adhiambo . Appreciated that they will be having a designated place for collecting water and washing clothes and reported that they will no longer fetch for water over long distances.

Walter Adongo : Appreciated the rehabilitation of the pan but he raised concern on the established boundaries of the pan that must be clearly demarcated.

Stephen Ouma: Was hopeful that the project will increase household incomes. He however, cautioned on the need for cooperation and ownership. He emphasized that that in the past, the community members used to collect water for livestock about 6kms far away at Lake Victoria and therefore currently the aspect of sustainability must be considered critically

Lead Expert. Raised concern on the access road to the pan and how the machineries will be ferried to the site. The community members promised to organize and clear the road and make it be accessible to the construction site

MIN 5 - 11/8/2021: CONCERNS, QUESTION & ANSWER SESSION AND RESPONSES

The Consultant assisted by the group chairman chaired the session to allow greater participation. The community were allowed to raise questions and concerns on the project and its possible impacts. The consultant, and KCSAP representative were available to answer and provide relevant explanations to the satisfaction of participants where possible. The feedback is summarized in the Table below.

Table 1.1 Concerns by ESIA meeting attendants and Responses by Consultants and KCSAP

SN.	Issues raised by the members	Brief explanation	Response
	Employment	During pan construction, preference will be given to the locals with emphasis on the youth During operation phase employment will be generated by sale of water, irrigation and sale of farm produce	The community agreed and promised to provide both skilled and skilled labour
	Breakage of the banks	The pan has been breaking its banks whenever it is completely full	The Engineers took note and have been discussing with local residents taking into consideration their indigenous knowledge
	Erosion	Stakeholders residing around the pan catchment sites will be encouraged to plant trees and construct terraces along contours to reduce soil erosion	The community requested for capacity building from the project management
	Mosquitoes/Malaria incidences	The pan will be installed with fish that can eat mosquito larvae The surrounding community members will be provided with mosquito nets	The pan management committee was asked to seek for support from the county government and local supporting institutions to provide mosquito nets

	Maintenance and sustainability of the pan	An account for the pan be established for running the funds collecting whenever water is drown from the pan	A sustainability strategy to be put in place so that pan maintenance issues can be addressed by a committee which has a funding mechanism
C	**Theft of pan equipments i.e solar panels**	There was a concern that there will be theft and vandalism of equipments	The Achar PMU to engage the youth in marinating and running the pan

MIN 6 - 11/8 /2021: SUGGESTIONS FROM MEMBERS IN ATTENDANCE

The community recommend that capacity building be done to them and farmers be supported with farm inputs for irrigation

The community requested that there be integration of the youth and elderly in operating and maintaining the pan

Training of trainers who will reach to more farmers. Suggestions were made to have representatives who can channel farmer views to agriculture office.

The farmers suggested that they be linked to producer organizations so that can be able to market their produce collectively to evade middle men or speculative buyers

MIN 7 – 09/24/2021: A.O.B AND ADJOURNMENT

There being no other business, the meeting ended with a word of prayer from Benson Otieno at 11:20hrs.

Signed by:

Mr. Elijah Levo — Environmental and Social Consultant — 8/11/2021

iii) Public participation attendace list

Kenya Climate Smart Agriculture Project (KCSAP)

Office of the CPCU - Siaya

REGISTRATION FORM

ACTIVITY: VISITS PROPOSED PAN SITES AND CATCHMENT AREAS DATE: 8/11/2021

NO	NAME	ORGANIZATION	DESIG	CONTACT MOBILE	CONTACT EMAIL	SIGN
21.	PHILIP OTIENO	ACHAR	commit	0792301068		[signature]
22.	GEORGE OTIENO	ACHAR		0791308171		[signature]
23.	TIMOTHY O. OGALLO	ACHAR		0721652191		[signature]
24.	SHARON ADHIAMBO [illegible]	ACHAR		0794626367		S.A
25.	TERESA OKOTH	ACHAR		0707080455		T.O
26.	MILKA [illegible]	ACHAR		0794606109		M.A
27.	MARY OCHIENG	ACHAR		0728158719		M.O
28.	LEAH OTIENO	ACHAR		0710456066		[signature]
29.	EMILY AKINYI	ACHAR		0703207920		E.A
30.	MAURINE AKINYI	ACHAR		0768503579		M.A.

Republic of Kenya

Kenya Climate Smart Agriculture Project (KCSAP)

Office of the CPCU - Siaya

REGISTRATION FORM

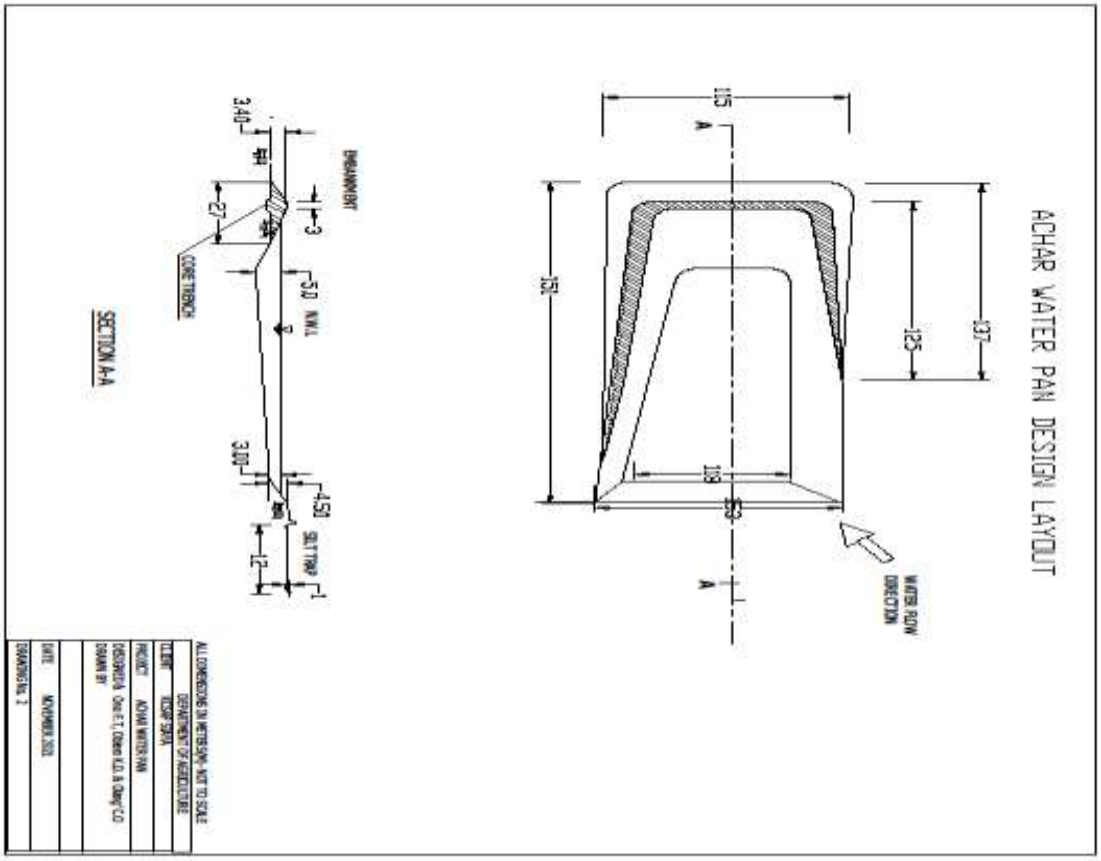
ACTIVITY: MEETING ACHAR WATER PAN MANAGEMENT COMMITTEE DATE 5/11/2021

NO	NAME	ORGANIZATION	DESIG	CONTACT MOBILE	CONTACT EMAIL	SIGN
1.	EVANS OMONDI OBARA	ACHAR WATER PAN	W/MANAGER	0729256683	Kabarevans66.gmail.com	
2.	PHILIP OTIENO	ACHAR	PMC	0792301048		
3.	ISAAC ATHANASIO OSUMO	ACHAR	PMC	0714516357	Isaacgmygmail.com	
4.	DAN OCHUNG OGUWAH	ACAR	CHAIRMAN	0724622934	Ogunadan@gmail.com	
5.	FREDRICK OUMA ONGINGA	ACHAR	Cashier	0720303372	Fredrick.o93@gmail.com	
6.	Samuel Juma Abala	ACHAR	P.MC	B.O.14	Samuel Juma Abala	
7.	JOHN ODHIAMBO O KATCH	ACHAR	OWNER	0722751961	Agwatz@gmail.com	
8.	ZEPHANIAH OTIENO	ACHAR	Community member	0720208342	otizeph@gmail.com	
9.	Peter Obala	Achar	Mem			
10.	George Amos Otieno	Achar	Member	0715210061		

P.O. Box 3 - 40600, SIAYA

Mob: +254 722 943269

iv) Project design/layout



v) Title Deed

THE LAND REGISTRATION ACT

THE LAND REGISTRATION (GENERAL) REGULATIONS, 2017

CERTIFICATE OF OFFICIAL SEARCH

TITLE NO. UYOMA/LAKEMENTA/373

SEARCH NO.

On the 11th day of March 2021 the following were the subsisting entries on the register of the above-mentioned title:

Part A — Property Section (easements, etc.) — Reserved for the use of Achar pond

Nature of title Absolute

Approximate area 4.20 Hrs Form Diagram No

Part B — Proprietorship Section

Name and address of proprietor 1. 24517 County Council of Siaya

Restrictions, cautions and restrictions

Part C — Encumbrances Section (leases, charges, etc.)

The following applications are pending:

(a)

(b)

(c)

(d)

The following certified copies are attached as requested:

(a)

(b)

(c)

(d)

Date 11th day March 2021

Seal

Signed by the Registrar

Name: J. O. Otieno

Signature:

DISTRICT LAND REGISTRAR BONDO / RARIEDA DISTRICT

P.O. BOX 102, BONDO

vi) Screening Checklist

WORLD BANK GROUP
Agriculture

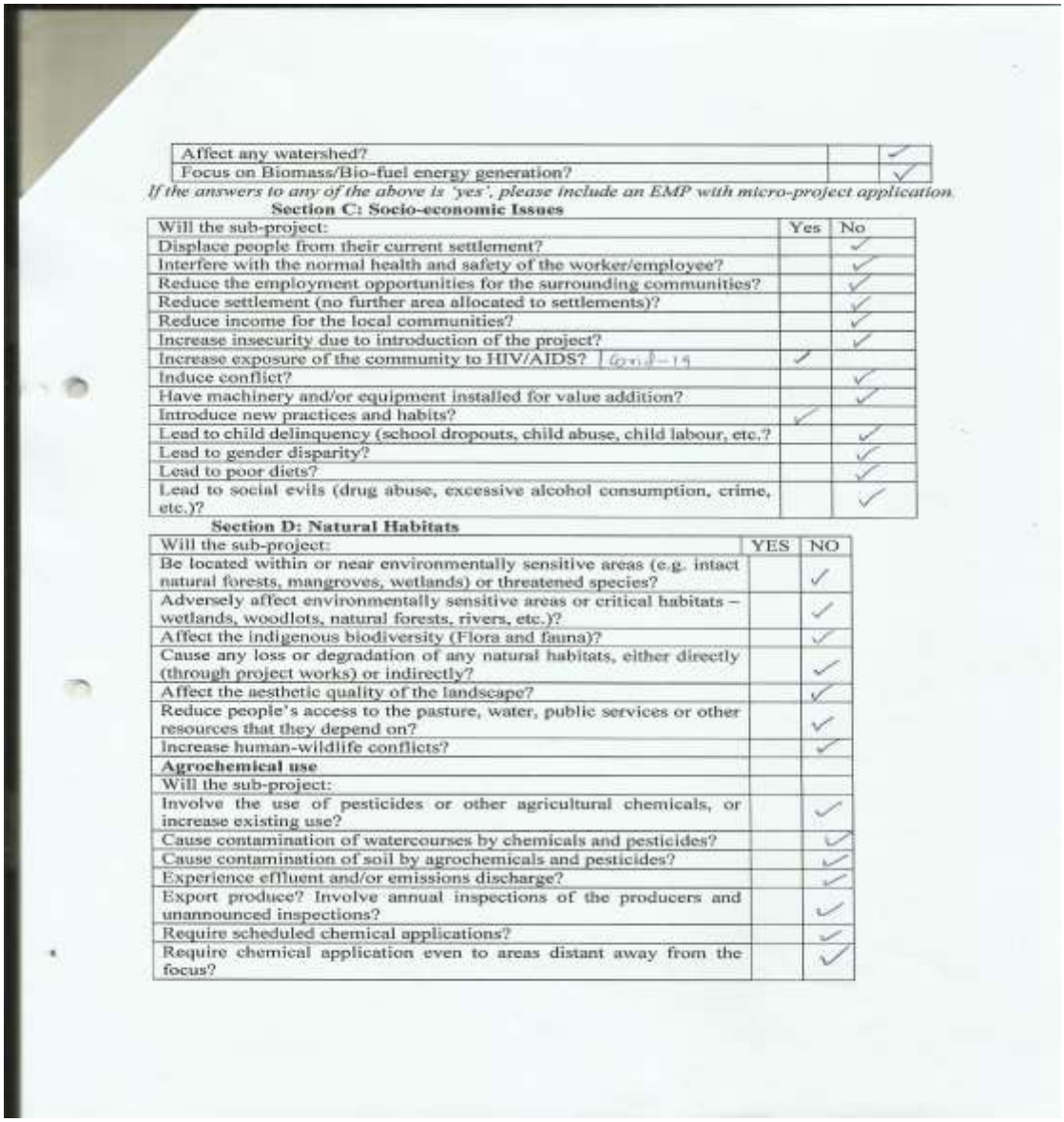
Third phase Sub Project Screening Checklist 2021

Section A: Background information

Name of County…SIAYA…………………
Name of CPCU/NEMA …[illegible]…………………………
Sub-project Ward…NORTH…UYOMA…WARD
Name of CBO/Institution…ACHAR…WATER PAN…
Contact Person….DAN….OCHONG….Cell phone..[illegible]…………
Sub-project name…REHABILITATION…OF ACHAR WATER PAN
Estimated cost (Ksh.) ……2.6 M……………………………
Approximate size of land area available for the Sub-project. [illegible]
Objectives of the Sub project….WATER….FOR…DOMESTIC…USE AND LIVESTOCK
……………………TREE…..NURSERY…ESTABLISHMENT……………………………
……………………HORTICULTURE……………………………………………………
Activities/enterprises undertaken….TREE…[illegible]…LIVESTOCK…KEEPING & SUBSISTENCE FARMING
How was the Sub-project chosen?..COMMUNITY…………
Expected Sub project duration…….1 YEAR……………………………………………

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?		✓

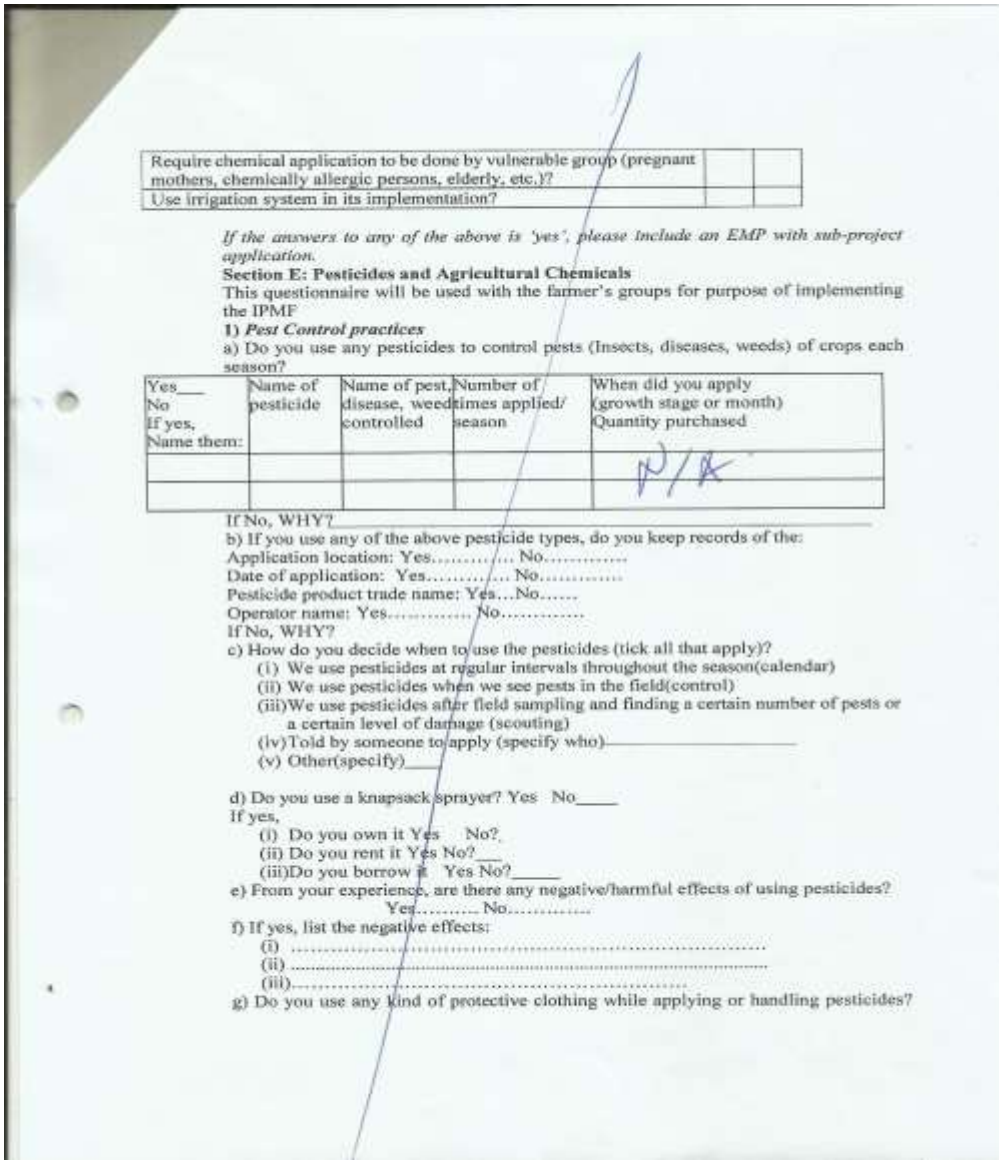
If the answers to any of the above is 'yes', please include an EMP with micro-project application.

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? [illegible]	✓	
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?		✓



Require chemical application to be done by vulnerable group (pregnant mothers, chemically allergic persons, elderly, etc.)?		
Use irrigation system in its implementation?		

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

Section E: Pesticides and Agricultural Chemicals

This questionnaire will be used with the farmer's groups for purpose of implementing the IPMF

1) *Pest Control practices*

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

Yes___ No If yes, Name them:	Name of pesticide	Name of pest, disease, weed controlled	Number of times applied/ season	When did you apply (growth stage or month) Quantity purchased
				N/A

If No, WHY?

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

Application location: Yes..... No.....

Date of application: Yes..... No.....

Pesticide product trade name: Yes...No.....

Operator name: Yes..... No.....

If No, WHY?

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

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

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

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

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

(v) Other(specify)

d) Do you use a knapsack sprayer? Yes No____

If yes,

(i) Do you own it Yes No?

(ii) Do you rent it Yes No?___

(iii)Do you borrow it Yes No?____

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

Yes..... No.....

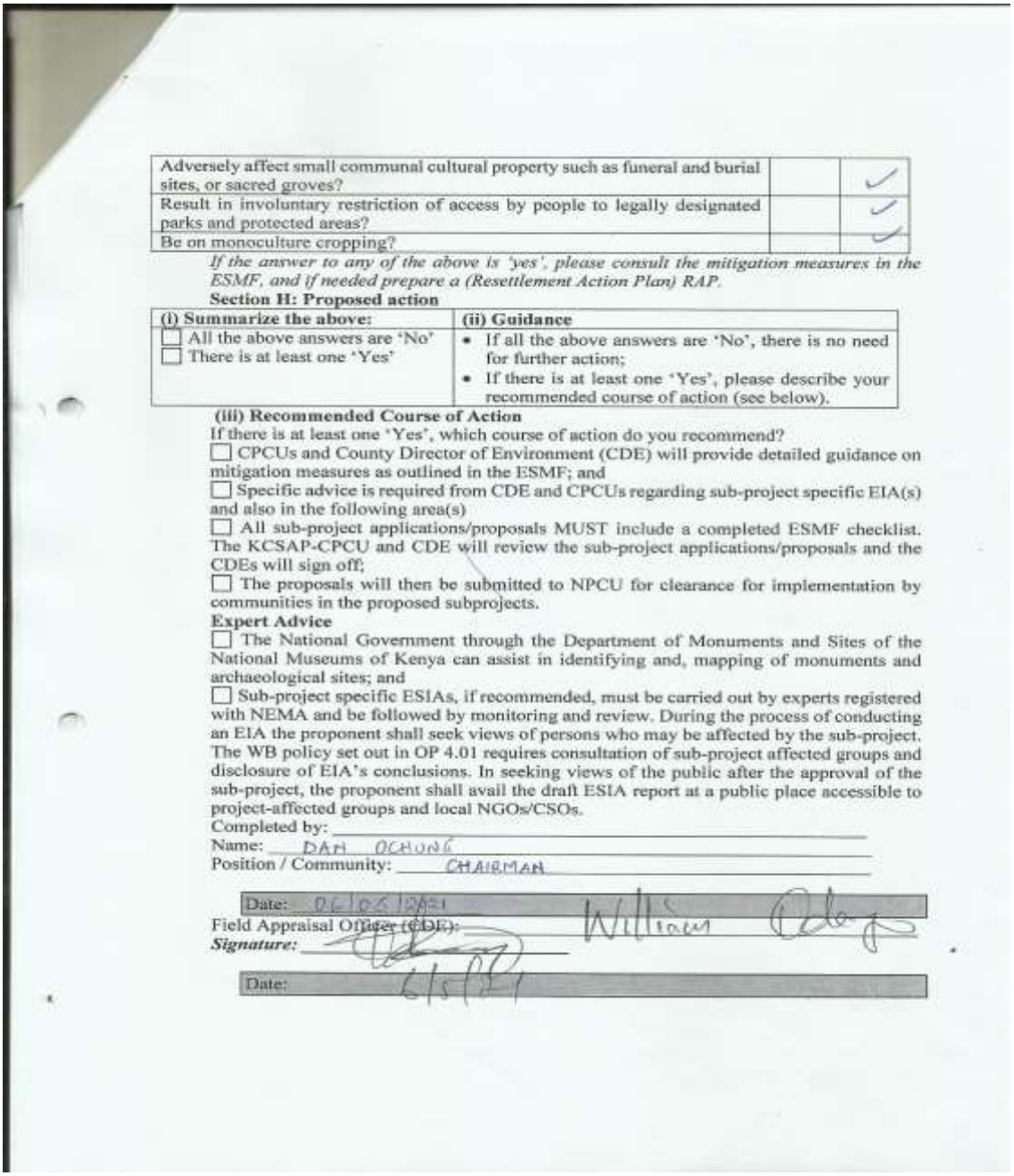
f) If yes, list the negative effects:

(i) .....

(ii) .....

(iii).....

g) Do you use any kind of protective clothing while applying or handling pesticides?



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
☐ All the above answers are 'No' ☐ There is at least one 'Yes'	• 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 ESIAs, 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: DAN OCHUNG

Position / Community: CHAIRMAN

Date: 06/05/2021

Field Appraisal Officer (CDE): William Odongo

Signature: _____

Date: 6/5/21

vii) ESIA Practicing License

FORM 7 (r 15(2))

nema

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/ERPL/13629
Application Reference No: NEMA/EIA/EL/18097

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

P.O. Box 34188-00100, Nairobi

is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert** registration number **9049**

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

Issued Date: 1/5/2021 Expiry Date: 12/31/2021

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

viii) Photo of participants filling individual questionnaire Checklist

Plate 9-1 Paricipants filling individual questionnaire forms

ix) Letter from NLC County Coordinator to Confirm that the Public Land is set aside for the Purpose

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

OFFICE OF THE COUNTY COORDINATOR

Tel: 0726881557

Ardhi House, 1st Floor
P.O. Box 803- 4060
Siaya

Ref: NLC/CC/SYA/GEN/VOL.I (54)

6th January, 2022

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

RE: CONFIRMATION OF PARCELS OF LAND AS PUBLIC LAND

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

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

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

Kind regards,

Nobert Wangalwa
County Coordinator