



**Kenya Climate
Smart Agriculture
Project**



WORLD BANK

SUMMARY PROJECT REPORT

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR
PROPOSED REHABILITATION OF YALA FISH FARMING UNIT BY
AQURAECH AT THE YALA FISHERIES CENTRE IN GEM 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 of Yala fish farming in by Aquarech at the Yala Fisheries centre in Gem Sub County Siaya County
Assignment Name	Environmental and Social Impact Assessment (ESIA) Summary Project Report (SPR)
Location	Yala Fisheries Centre Gem Sub-County, Siaya County
GPS Coordinates	Latitude 0°05'46.1N Longitude 34°32'22.5E
Project Description	Rehabilitation of fish ponds Assembling of a housing panel or installation of a Container Construction of a cold storage unit Construction of a fish aggregation unit Solar panels with accessories Solar powered cold storage facility Construct a concrete floor Construction of a store for keeping feeds and reducing post-harvest losses Construction of an office
Main source of water	It will be from Yala water supply at the fisheries Office
Proponent	Aquarech fish aggregation and marketing link
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:
Aquarech aggregation and marketing limited :

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 Constriction of a multipurpose fish processing facility at the Yala fisheries centre Gem sub County Siaya County.

LEAD ESIA/ EA EXPERT

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Designation: Conty Project Coordinator Date 27th -2-2022

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
KCSAP	Kenya Climate Smart Agriculture Project
Km ²	Square Kilometers
Ksh	Kenya Shillings
M	Meters
M	Million
mm	Millimeter
MOALF	Ministry of Agriculture, Livestock and Fisheries
NEMA	National Environment Management Authority
OPs	Operational Policies
PAPs	Project Affected Persons
PPE	Personal Protective Equipment
SESA	Strategic Environmental and Social Assessment
SPR	Summary Project Report
STDs	Sexually Transmitted Diseases

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 communities in Kenya, and in the event of an eligible crisis or emergency, to provide immediate and effective response. The Project activities will contribute to these objectives by up-scaling Climate-Smart Agriculture (CSA) Practices and supporting fisherfolks 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 construct a fish bulking unit and a cold storage facility Environmental and Social Impact Assessment for proposed 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 Yala Fisheries centre on 24th February, 2022 where 40 participants (25 female and 15 male) participated in the exercise. A total of 15 questionnaire were randomly distributed to various community members. It is anticipated that the project will benefit approximately 800 households residing around the catchment area.

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 foul smell), pollution from fish processing wastes siltation of ponds and loss of aesthetic value. Community members may also consume or sale poorly stored fish leading to contaminated fish. Conflicts over water demand may arise. Mitigation measures against significant negative impacts during excavation will include, observation of safety by all within the site and operationalization of the cold storage facility to reduce post-harvest loses and landscaping around the fish ponds, Others include clean pond water for fish farming . During operation phase mitigation measures could be fencing off the site, soil

conservation along the waterways to the ponds. More vegetation should be planted by establishing fodder trees such as *Moringa olifera* with a high content of crude protein content for fish feed .Operationalized cold storage facility which is solar powered to reduce incidences of power shortages or black outs. During decommissioning the fish pond 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 amount of water required fish processing facilities The issues were addressed by various stakeholders including the County Food Technology expert who was tasked with the revision of the bill of quantities to incorporate provision of extracting water from the existing borehole. 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 420,000 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 Food scientist, 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 fish processing facility is estimated at Kshs, 10,000,000 while the cost of implementing ESMMP is KES 380,000

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 producer organization projects. The proposed Aquarech fish farming unit is located at Yala Fisheries Centre in Gem Sub County Siaya County. Yala fisheries centre is a county government property which has non-operational fish ponds. The project is being implemented through a public private partnership arrangement. Aquarech a private entity has signed a contract with the county government in collaboration with the fish farmer's organization in the area.

The objective of the project is to set up a fish farming unit, cold storage facility, mini processing unit and a shop for selling fish feeds and fish. The aim of the partnership is to help the farmers to have a sense of ownership. It will also provide credit at a subsidized rate through fish farming inputs like imported quality feeds

1.1.1 Project justification

The main project area and surrounding of Yala fisheries farming unit for capacity building and technical expertise from the department of fisheries. Information modern fish farming technologies is lacking and inadequate availability of quality feeds.

The fish farmers do incur a lot of challenges in marketing their fish because they do not have a producer organization in place. The farmers produce and market individually hence the need to provide an aggregation and marketing point where the Aquarech organization will provide support to the farmers by linking them to markets

Through the use of modern digital technology Aquarech as a private organization had developed a digital App that will share technical capacity building, feed availability, prices and market for the final products

Specific objective

- i. to construct a multipurpose fish farming unit
- ii. To construct an aggregation unit with a cold storage facility
- iii. To undertake mini fish processing and set up a shop for selling the fish
- iv. To provide technical capacity support to the fish farmers

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, and 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 (Annex VI) . 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 the fisherfolks 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, people and fish) 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 (Annex VI) findings. Screening checklist form revealed (ANNEX VI) that the proposed fish farming unit and its accessories fall in second schedule ponds, 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 24th February, 2022. 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. Public meetings (ANNEX II) were undertaken at the proposed site and the project area, evidence photos attached. During the meeting held on 24th February, 2022, 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 7 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 (SPR) was to be carried out to full completion within a period of 14 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 food technology expert . Additionally, it provides an overview of project activities during construction, operation and decommissioning phases. Included is a proof of land ownership and a description of any existing environmentally sensitive areas and description of the project area

2.2 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 of fish prcessing facility and fish ponds 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 plant will cater for block ice requirements of fishermen, fish traders, fish transporters operating at Yala fisheries (Annex VI). The aim is to bring ice significantly closer to this market currently not available

Current estimated demand for ice is based on a ratio of 1:1 (fish: ice) therefore a production of 700 MT of fish will require an equal 700 MT of ice annually translating to approximately 5 MT a day. In this project there will be a detailed topographical survey and on the map precisely locating the site for construction, to enable one to exactly calculate its ice production and fish tonnage storage capacity is a must. This will lead to design of the ice plant and storage facility. 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.

Estimation of ice requirement

It is possible to calculate the ice requirement if the operational conditions are known. These conditions are often variable and un-repetitive. Only a series of tests, under operational conditions, will establish the correct fish to ice ratio to be used to cool the fish and maintain chilled temperatures during the entire storage period.

Calculated values of ice usage can provide valuable information at the planning and design stages, and also promote a better understanding of the relative effect of the various elements which influence the rate of ice meltage. In addition, by considering all possibilities and calculating ice requirements, a more rational judgement can be made when selecting equipment and procedures to be used.

To determine the ice requirement, it is necessary to calculate the quantity of ice to cool the fish and also the quantity of ice required to maintain the fish at a chill temperature throughout the storage period. In addition, allowance has to be made to allow for losses and other contingencies in order to determine the ice manufacturing requirement.

Dimensions of the facility

The proposed fish aggregation farming unit will have a receiving bay, cleaning and washing unit a cold storage after processing, packaging and a place for marketing

Calculation of the ice requirement for cooling fish

The mass of ice needed to cool fish from the initial temperature to the final holding temperature can be calculated from an expression, which equates the heat taken up by the ice, on the left side of the equation, with the heat lost by the fish, on the right side of the equation.

$$M_i (L_i) = (M_f) (C_{pf}) (t_s - t_c) \quad (4)$$

Where

M_i = mass of ice which melts (kg)

L_i = latent heat of fusion of ice (80 kcal/kg)

M_f = mass of fish (kg)

C_{pf} = specific heat of fish (kcal/kg°C)

t_s = initial temperature of fish (°C)

t_c = final temperature of fish (0°C)

From equation (4) the ice requirement will therefore be:

$$M_i = \frac{(M_f)(C_{pf})(t_s - t_c)}{(L_i)} \quad (5)$$

The specific heat of lean fish is approximately 0.8 kcal/kg C and this value should be used if there is a species mix or if there is a possibility that at times all the fish are of a lean species. The specific heat value, however, may be refined to take account of variations in the oil content of the fish and this refined value may be used if the fish composition is reasonably consistent.

$$C_{pf} = 0.5 X_I + 0.3 X_s + 1.0 x_w \quad (6)$$

Where

C_{pf} = specific heat of fish (kcal/kg)

X_I = mass fraction of lipids (oil)

X_s = mass fraction of solids

X_w = mass fraction of water

To illustrate the effect of oil content on the quantity of ice required for chilling the following comparison is made between lean and fatty fish. Example (1) - 100 kg lean fish with 1% lipids, 19% solids and 80% water at an initial temperature of 20°C:

$$C_{pf} = (0.5 \times 0.01) + (0.3 \times 0.19) + (1.0 \times 0.8) = 0.862 \text{ kcal/kg}^\circ\text{C}$$

$$M_i = \frac{100 \times 0.862 \times (20 - 0)}{80} = 21.55 \text{ kg of ice}$$

Source (FAO Fisheries report, 1992)

According to the feasibility studies undertaken on ice requirement for the plant is as indicated in the table 2.2 below

Table 2.2—1: Estimating Ice requirement

Estimating Ice requirement			
Category	No	Unit requirement per day	Total requirement
Fishermen	70	150	10.5MT
Transporters	4	1.2 MT	4.8MT
	Estimated demand (peak season)		15.3MT

2.2.2 Marketing plan and dimensions of the ice plant

Location of the ice plant

The proposed site for the ice plant is within the Yala Fisheries unit offices which was found to be suitable considering that it is a government premise and the project is being implemented under public private partnership arrangement. The project will efficiently serve its customers, save on ice handling costs and spoilage, The site is also easy to connect with electricity, water is readily available, the road network is good and it is a fairly secure area

There will be manpower requirement- plant operator, bookkeeper and casuals. Technicians for repair & maintenance on need basis

Technology requirement, compressor, crushers, ice tools gravity conveyor, storage water tank, water system comprising of borehole and other accessories

Space requirement

Ice plant Size 600 sq m

Insulated Ice cold storage 10m by 5 m

Ice

Price for ice- Ksh. 10 / kg compared to competitor price of Ksh 12-15/kg

Price discounts for large quantities – above 100 kg

Different Packaging for different customers in bags of 30 kgs each

Target also non-fish customers domestic and food handling businesses

Fish

Improve product distribution- refrigerated truck

Target strategic markets like supermarket chain in Kisumu and other neighbouring towns

Promote local fish consumption

Target institutional buyer's hospitals, schools and external markets

2.2.3 4.1.6 Market and Trade

The fish destination market is left out to the private partner the Aquarech fish limited.

Access Structures

Perimeter fencing/Restrictions:

The ice plant and cold storage facility shall be in a restricted area only accessible through a single controlled point. This will be achieved through perimeter fencing and allowing one appropriate and convenient access point.

Construction of sanitation facilities

This entail construction of a VIP Two door pit latrine outside the ice plant and cold storage facility area about 100 hundred meters away

Table 2.2—2: Estimated cost of the ice plant and cold storage

CAPITAL INVESTMENTS				
No	Item	Unit	Unit Cost	Total Cost
1	Ice Plant 10 ton ice/day	1	15,000,000	15,000,000
2	Insulated cold storage- 10 m by 5m	1	3,600,000	3,600,000
3	Installation cost	1	500,000	500,000
	TOTAL COST			19,100,000

2.3 Construction phase

2.3.1 Support infrastructure

Support infrastructure will comprise of fencing the entire works site

Ice plant cold storage ancillary works will include but not limited to the following:

- i. Clear site of all grass/vegetation an
- ii. Excavation
- iii. Concrete blinding
- iv. Masonry
- v. Walling
- vi. Roofing
- vii. Fixing doors
- viii. Fixing windows
- ix. Construction of Septic Tank
- x. Construction of Soak Pit
- xi. Construction of two door pit latrine

2.4 Materials and Equipment Needed

Strict Control of levels and the mixing ratios and measurements of all reinforced concrete and masonry works should be exercised to ensure the intended quality of construction works as well as water flow pressures so as to eliminate problems such as rapid deposition.

Table 2.4 below indicate the materials, tools and equipment that will be used during construction

Table 2.4—1: Materials and Equipment Needed

Materials	Construction/D Tools &Equipment
Automotive Diesel fuel, water, Soil, cement and sand. Pipes of various sizes and ballast, metal rolls and metal bars of various sizes, wire	Excavator, Concrete Mixer, Air Compressor, Concrete Vibrators

mesh of various gauges	Masonry Tools Plumbing Tools and, An Automatic Survey Level
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It is important to note that during construction the following will be incorporated;

- a) Environmental Protection and Resource Conservation guidelines
- b) Occupational Health and Safety measures
- c) Other facilities to be provided include water troughs and toilets

2.4.1 Construction materials

Construction materials will be stored on site. Bulky materials such as rough stones, ballast, sand and steel will be carefully piled on site. To avoid piling large quantities of material on site, the proponent will order bulky materials such as gravel and stones in quotas. Materials such as cement, paint and glass among others will be stored in temporary storage structures to be built for this purpose.

The design of the project will be executed with due considerations of the existing topography of the proposed project site. In general, the design of the project will optimize the use of Best Available Technology (BAT) to prevent or minimize potentially significant environmental impacts associated with the project and to incorporate efficient operational controls together with trained staff, to ensure high level business and environmental performances

2.4.2 Construction Phase Activities

The phase entails infrastructure that comprise of soil conservation structures upstream to control soil erosion

The fish farm ancillary works will include but not limited to the following:

- ✓ Excavation works
- ✓ Construction of water piping
- ✓ Fencing of the entire fish farming unit
- ✓ Construction of two door pit latrine
- ✓ Construction of a cold storage facility
- ✓ Construction of a store

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.

2.4.3 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 and trees species that do not extract a lot of water from the ground the management committee will work closely with Kenya Forestry services whose office is adjacent to the site, Identification of fish aggregation points before onward delivery to the unit for processing and marketing Running a solar powered cold storage facility to help in minimizing post harvest losses. Salle of fish feeds and provision of technical expertise on fish production and marketing

2.4.4 Decommissioning Phase Activities

Decommissioning of the constructed fish processing unit will become necessary if or when the unit attains its end life i.e when it no longer become productive or when the need arises. Once this occurs, the unit will be deactivated according to the closure procedure. Non-reusable pipes will be sold to licensed scrap metal dealers. The closure of the uit will involve removing the building pannels, container and backfilling of the depression left behind as necessary. The affected area will be backfilled, landscaped and replanted with suitable indigenous grass and trees.

2.5 Types of waste to be generated

Table 2.5 below indicates the types of waste to be generated during project implementation and proposed options for their management

Table 2.5—1: Types of waste generated

Types of Waste	Proposed Waste Management Option
Used oil filters	<ul style="list-style-type: none"> Accumulate safely and dispose-off through licensed hazardous waste handler
Used fuel filters	<ul style="list-style-type: none"> Accumulate safely and dispose-off through licensed hazardous waste handler
Used Oil	<ul style="list-style-type: none"> Accumulate safely and sell to licensed scrap metal dealers
Empty plastic & Metal containers	<ul style="list-style-type: none"> Issue out to staff for refuse Issue out to the local community as part of corporate Social Responsibility (CSR) contribution Reuse within household e.g for fabricating solid waste containers Return to the supplier for reuse
Empty gunny bags	<ul style="list-style-type: none"> Issue out to the local community Reuse within household Return to the supplier
Noise	<ul style="list-style-type: none"> Undertake operations during the day

2.6 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 10,000,000**

3 LOCATION OF THE PROJECT

3.1 Proof of Land Ownership

The Yala fish processing unit is located on public land with a parcel L.R number SYA/103/90/3 registered under Yala fisheries centre. The land for the construction and installation of facilities is public land and the county government in collaboration with a private firm Aquraech has entered into a public private partnership arrangement. Attached Annex iv. The surrounding fish farms are privately owned and the owners have shown willingness to engage in fish farming and provide fish for value addition and marketing to the unit.

Project Location

The project is located in Yala Fisheries centre, Yala Ward, Yala Sub-County, Siaya County. The project site lies within Latitude 0°05'46.1N Longitude 34°32'22.5E project will also benefit the following surrounding fisherfolks and communities in aggregation and marketing .A geographical satellite image of the project location showing proposed site of the cold storage and process unit is presented in figure 3-1 below. The facility is situated in Yala Township off Kisumu Busia road about 500 metres from the road

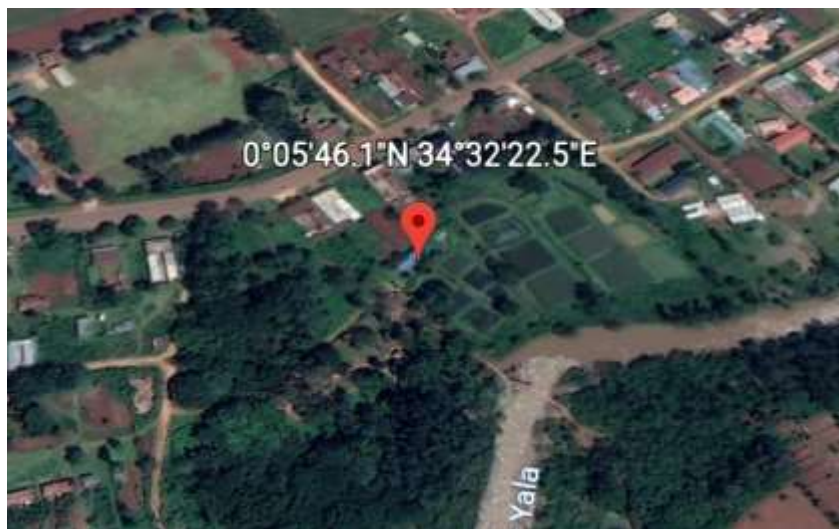


Figure 3-1 Location of project site

Land ownership

3.2 Environmental Management Supportive Infrastructure

The proposed project site requisite environmental supportive infrastructure. There exists an earth access road which is about 500meters from the main Kisumu Busia tarmac road that can be used to access the site. Yala River is about 1 Km from the site. The water supply is from a borehole in that exists in the fisheries premise and a water supply from River Yala . The project site is connected to power from the grid and a transformer is located about 10 meters from the site.

3.3 *Physiographic and Natural Conditions*

3.3.1 **Physical & Topographic Features**

The project area is within a sloppy area which is well covered by grass. 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.

3.3.2 **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 color 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 favour water retention, due to their poor workability during rainy season, the proponent will endeavour to undertake the construction during relatively dry season so as to mitigate on energy losses and emissions.

3.3.3 **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 proposed is located in the Lower Midland 2 (LM2) in an altitude of about 1500 m A.S.L the mean annual temperature is approximately 22° Centigrade

Precipitation

The site is wetter towards the higher altitudes in the northern part particularly Gem, Ugunja and Ugenya sub-counties. On the highlands, the rainfall ranges between 800mm – 2,000mm, reliability of rainfall is about 66 percent.

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.

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 ~0.5°C 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.

3.3.4 Land and Land use/Zonation

The sub Project area can be categorized as Lower Midland zones (LM2). The climate can support suitable crop varieties such as maize, beans, finger millet, coffee, sweet potatoes and rain fed rice (Table 3.3)

Table 3.3—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

3.3.5 Aquaculture

Gem Sub County have the highest number of fish ponds as shown in the table below. This provides an opportunity for construction of a fish aggregation, processing and marketing unit at the Yala Fisheries centre in the sub county. On average farmers have 3 ponds and one pond can produce 300kgs of fish. The total number of active farmers is about 50. Table 3.3 indicates that the highest number of fish ponds are in Gem around the proposed project site.

Table 3.3—2 Aquaculture units and production

	Rarieda	Bondo	Alego Usonga	Gem	Ugenya	Ugunja	Total (2016)
Metric tonnes	22.0	15.4	21.0	32.5	19.8	26.6	137
% contribution	16.0	11.3	15.3	23.7	14.4	19.6	100
million Ksh	3.6	2.7	3.5	6.5	3.3	4.5	24.1
Area under fish ponds (Ha)	75.3	38.1	96.2	106.9	45.1	52.4	413.9
Fish cages	53	1873	0	0	0	0	

3.3.6 Flora and Fauna

The area is largely settled, some of the most common trees in the area include *exotic trees such as Jacaranda mimospholia, Gravillea robusta*. 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

3.3.7 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.

3.4 Socio-economic Environment

3.4.1 Population

Yala township ward where the project lies is densely populated as depicted in Table 3.4. This phenomenon put pressure on need to basic services such as supply of water for both household and domestic use. Approximately 1,500hh will benefit from the project

Table 3.4—1 Population Characteristics by Ward and Location of the project area Yala Township,

		Total	Land Area	Density per Sq. km
Ward	North Gem	50,022	86	314
	South Gem	37,945	63.3	266
	East Gem	35,389	71.9	309
	Central Gem	34,088	52.2	284
	Yala Township	33,084	46.1	492
	West Gem	33,555	85.2	

Source: KNBS, 2019

3.4.2 Infrastructure and Access, Road, Rail Network, Ports and Airports, Airstrips

Electricity is within the project site. The area has permanent water springs that can supply water to fish pond and water for the fish processing unit. The project will provide solar energy in order to supplement power from the national grid

The means of communication in the subproject area are as listed in Table 4. It is estimated that 75.2 per cent of the households in the County own a radio, 13.7 per cent television sets, 90 per cent mobile phones with main operators being Safaricom and Airtel communication companies, 0.5 per cent landline and 1.2 per cent of the households own computers. Siaya County headquarters has a fiber optic cable that has led to increased internet connectivity. It is important to note that most of the government offices have internet connection through modems.

Table 3.4—2 : 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

3.4.3 Housing

The major housing type in the area is mud walled iron roofed houses. Table 3.4 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 3.4—3: 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

3.4.4 Health and Environment

Residence of the area access health services from Yala sub County District Hospital which is 3km from the site. This is government health facility majorly dealing with outpatients.

Water Access and Sanitation

The Project area’s groundwater potential is high and there is a permanent spring within the project site. 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 0.1 Km. About 90% 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.

Ownership of fish ponds and usage

According to the Siaya Fisheries Officer that most fish ponds belong to men who never allowed their wives or children to fish from them before harvest time. It also emerged that, at harvest time the men sold most of the fish leaving little for family consumption. This is because most men carried out fish farming as a source of income but not for household food consumption. This could explain reasons why not enough fish is consumed at household level in the county. This is an indication that fish was playing a role in the availability and diversity of food.

3.5 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 fish aggregation processing and marketing unit 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 24th February, 2022 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 (Annex I)
- ✓ Public / Technical Meetings at various levels and with different target groups



Community sensitization meeting

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 24th February, 2022 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 aggregation, processing storage and marketing of the fish processing facility 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 department of fisheries 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 4-2 and 4-3).



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 fish processing and marketing facility producer organization. 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 4-4 below:

Table 4.4—1 Stakeholder Consultative meeting key concerns

SN.	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.	Contingency funds	Is there any funds for contingency or incase of emergency	Yes in any BQ or budget there is 5 to 10 % c
4.	Erosion	Stakeholders residing around the 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
5.	Credit for purchase of fish feeds	Will there be credit facilities to support the fish farmers	Yes Aquarech will provide credit in form og inputs i.e either fish feeds or fingerlings
6.	Mosquitoes/Malaria incidences	The ponds oncee installed with fish that can eat mosquito larvae The surrounding community members will be provided with mosquito nets	The project management committee was asked to seek for support from the county government and local supporting institutions to provide mosquito nets. This is a public private partnership arrangement
7.	Disposal of waste from the fish processing factory	How will the wasters from the fish be disposed i.e scales ovals and dead or spoilt fish	There will be a soak pit and an incinerator to burn all the containers without exposing the air to the atmosphere
8.	food security and nutrition security	How will the individuals market their fish there has been a marketing problem resulting in post harvest losses	The members of the fisherfolks will be encouraged to form groups and will be linked to markets so that they can have collective burgaing power
9.	Improved Economic status	Income at household level will be enhanced, communities will be able to sell fish and fish products at favorable prices .	The community members will be connected to producer organizations in order to fetch out better prices

10. Enhanced livelihood resilience and alternatives	Once the fish aggregation processing unit is in place, there will be employment in operation of the factory and maintenance.	Idleness in the community will be reduced and community members will be engaged in productive labour
11. 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
12. 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
13. Increased incidence of fish predation	During operation phase there will predation from birds and stealing of fish from the ponds	The entire project site will be fenced and the ponds will be covered with nets to protect fish from predation
14. Contamination of feeds	Are the feeds likely to be contaminated and how shall the community undertake testing of feeds	According to the KBS feeds will have labels of expiry date. A Sample of feeds will also be taken to KBS or credible institutions for testing the ingredients There will also be effluent discharge tests from the ponds as per the NEMA regulations

4.5 Salient issues

4.5.1 Opinion on Project implementation

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.

4.6 Anticipated impacts

4.6.1 Positive Impacts

Positive impacts identified by stakeholders include the following:

- Increased employment opportunities
- Conservation of the catchment through tree planting
- Improved food security and nutrition security
- Reduced post harvest losses (Prolonged shelf life of the fish and its products)
- Availability of manure from fish wastes .
- The proposed construction will ensure that there is storage of fish value addition and improved market access

4.6.2 Anticipated negative impacts

Some of the negative impacts identified include the following:

- Dust and air pollution during construction and paints from construction of cold storage facility
- During operation phase there will be increased solid and liquid waste disposal around the premise
- Anticipated possible conflicts over job and access to facilities
- Increased pressure at the watering points and demand of water for cleaning the processing facilities
- Incidences of erosion along the waterways
- Cases of siltation in the fish ponds
- Chances of drowning in the pond
- Chances of water bornediseases and increased incidence of mosquitoes

4.6.3 Suggestions and comments from public consultations

- Creation employment opportunities during the project cycle from construction to operation and the staff that will be involved in the daily cores within the project after its completion such as sale of ice, prolonged shelf life of fish, market for the fish.
- There will be increased efficiency that that will result in faster turn-around time of fish farming hence increased volume of fish from ponds once the ice plant and cold storage is constructed
- Ensure the workers/employees of the proposed project are insured through WIBA for adequate compensation due to injury while at work.
- Reduced post harvest losses and .increased value addition
- 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
- Sensitize the community and workers on sexual harassment and gender based violence
- Promote gender empowermen on throughout the phases of the project

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 4.5—1 Summary of expected impacts, rating and development stage

Environmental Impact	Positive/negative	Direct/Indirect	Temporary/ Permanent	Major/Minor	Occurrence	
					Design/ Construction	Operation
Enhanced resilience and livelihood diversification and food security status	Positive	Direct	Permanent	Major		Yes
Job creation by providing ice to community members who can sell or even use to prolong the shelf life of fish	Positive	Direct	Permanent	Major	Yes	Yes
Economic gains	Positive	Direct	Permanent	Major	Yes	Yes
Optimal use of land	Positive	Direct	Permanent	Major	Yes	Yes
Soil Erosion	Negative	Direct	Temporary	Major	Yes	Yes
Noise pollution	Negative	Direct	Temporary	Major	Yes	No
Oil spills	Negative	Direct	Temporary	Minor	Yes	No
Dust Emission	Negative	Direct	Temporary	Minor	Yes	No
Excavation works	Negative	Direct	Temporary	Major	Yes	No
Generate of exhaust emission	Negative	Direct	Temporary	Major	Yes	No
Increased water demand	Negative	Direct	Permanent	Major	Yes	Yes
Increased potential for accidents	Negative	Direct	Temporary	Minor	Yes	Yes
Solid waste generation	Negative	Direct	Permanent	Major	Yes	Yes
Disposal of excavation soil and other materials	Negative	Direct	Temporary	Minor	Yes	Yes
Biodiversity conservation	Negative	Indirect	Temporary	Minor	Yes	Yes

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 around the fish ponds

5.1.1.2 Biodiversity conservation and enhancement

Landscaping and planting of trees and flowers in the compound and its 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 labourers whose workforce shall be needed in the construction. Several workers including casual labourers, 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 trees around the project 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.

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

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 contractor 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 spread 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.

5.3 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. This would in turn allow them to spend their energy and time on economically and socially viable activities for their families;
- ii. Food, nutritional and livelihoods security.
- iii. Improved availability of fish throughout the year

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 project site.*
- *Protect sensitive vegetation from soils excavated*

5.3.2.2 Water quality nitrate pollution by use of fertilizers upstream on the fish ponds

Human activities upstream is likely to affect the fish farms downstream by contaminating the fish ponds

Mitigation measures

- *Sensitization of the farmers and land use practices upstream*
- *Invoke NEMA laws on river bank management and swamp protection*
- *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. The runoff may transport the wastes and debris from the catchment into the fish farming areas downstream. Poor workmanship or failure to maintain the sedimentation ponds may lead to excessive siltation in the ponds .

Mitigation measures

Silt traps will be constructed upstream to reduce the amount of soil that is transported downstream. Reduced silt levels will prolong the lifespan of the ponds and hence increase fish production. 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..

- 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 fish pond hence increased incidences of malaria

Proposed Mitigation

- i Provision of mosquito nets to the people residing around the fish pond areas
- ii clearing of bushes around the ponds
- iii Fish will eat the mosquito larvae

5.3.2.5 Ensure efficient energy consumption

Mitigation

The proponent shall plan and install an energy efficient system at the proposed project. This will contribute immensely to energy conservation during the operational phase of the project. In addition, workers will be sensitized to ensure energy efficiency in their operations. To complement these measures, it will be important to monitor energy use during the operation of the proposed project and set targets for efficient energy use

5.3.2.6 Risk of oil spills from machineries during fish processing

Mitigation

A drainage system will be put in place to collect all the oil/lubricant spills to a soak pit for disposal as per the set regulations

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 that may occur in the processing plant.
- ✓ Consumption of water before treatment
- ✓ Breeding of mosquito from the fish ponds

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 ponds by fencing the site.

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

5.3.3.4 Spread of COVID-19

The potential for the spread of any infectious disease like COVID-19 is high.. There is a risk of gatherings of large numbers of people who may contract the virus and fall sick becoming this will impact heavily 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 fish 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

5.3.3.5 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.

5.3.3.6 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 fish farming and sale of fish. The income is expected to reduce following termination of the Aquarech fish project.

Mitigation

Fish farmers ill have to be trained or encourage to undertake alternative livelihoods like planting of arrow roots in the decommissioned sites which are located in the swamps .

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

5.5 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.

5.6 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 fish aggregation, processing and marketing facility 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 operation phase
- 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 fish aggregation and processing facility. 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 5.6—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						
Clearing/ destruction of vegetation	<ul style="list-style-type: none"> • Only clear enough area for the cold storage facility • Mature trees should not be cut unless extremely necessary. • Plant indigenous palatable trees species around the project site 	Contractor	Continuous during Construction	<ul style="list-style-type: none"> • Number of indigenous palatable species planted • 300m Perimeter fence chain link round the fish processing facility 	<ul style="list-style-type: none"> • reports/photographs • -Site plan showing vegetation clearance 	Contractor cost
Soil erosion	<ul style="list-style-type: none"> • All excavation works must be properly backfilled and compacted • Construction of terraces in the slopes • Promote agroforestry upstream 	Contractor/Project management unit	Continuous	<ul style="list-style-type: none"> • Length of gabions constructed • Acreage coverage of trees planted upstream 	<ul style="list-style-type: none"> • Reports • Field visits 	Contractor cost
Increased noise and vibration generation	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • No of PPE provided to workers • No. of cases reported relating to noise pollution 	<ul style="list-style-type: none"> • Noise Levels • Duration/time of the day • Reports 	Contractor cost
Air Quality Degradation due to dust and exhaust emissions	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> • No of Workers/vehicle operators sensitized on reduced emission 	<ul style="list-style-type: none"> -site visit /reports Photographs Sensitization meeting report 	Contractor cost

				<ul style="list-style-type: none"> No. of PPE supplied 		
Oil spills/Fuels and Lubricants	<ul style="list-style-type: none"> ✓ Vehicle maintenance should be done on purpose built • Impervious concrete platforms with oil and grease traps. • Standard operating practices for re-fueling mobile equipment such as a minimum 15m from any water channel should be practiced 	Contractor	Construction phase	<ul style="list-style-type: none"> No of Oil and grease traps established 	<ul style="list-style-type: none"> Records Register on vehicle maintenance 	Contractor cost
Increased generation of solid wastes	<ul style="list-style-type: none"> • The base camp of the contractor should not be in the catchment area of the fish ponds . • appropriately • Recycle any useful material during civil works • 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	<ul style="list-style-type: none"> No. of waste bins/receptacle Quantity of Waste No of designated waste collection points 	<ul style="list-style-type: none"> Type of waste Designed waste collection points established Waste collection company engaged 	Contractor cost
Visual Impacts and aesthetics	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> Volume of waste cleaned up Area compacted Number and size of materials stores erected Area of site rehabilitated 	<ul style="list-style-type: none"> Cleaning up of waste Compacting loose soils Establishment of a materials store Site rehabilitation 	Contractor cost

<p>Occupational Health and safety Hazards</p>	<ul style="list-style-type: none"> • Provide workers with appropriate personal protective clothing: helmets, boots and overalls • 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 human movement inside by fencing the site. 	<p>Contractor/Project management unit</p>	<p>Continuous during construction</p>	<ul style="list-style-type: none"> • No. of HSE trainings • No. PPE provided • First Aid Kits availability • Availability of sanitation facility • No. of Accidents/incidents 	<ul style="list-style-type: none"> • PPE provided • Recorded accidents occurrences and near misses • OSH sensitization conducted • Field visits 	<p>20,000</p>
	<p>Social Impacts</p>					
<p>Increased Spread of STD, HIV & AIDS,</p>	<ul style="list-style-type: none"> • Community sensitization on HIV/AIDs • Contractor to sensitive workers and provide condoms on site as well as within the project area. 	<p>Contractor /Project management committee</p>	<p>Throughout construction Period</p>	<ul style="list-style-type: none"> • No of Cartons of condoms distributed and to the relevant persons • No. of HIV trainings and awareness campaign • Code of Conduct 	<ul style="list-style-type: none"> • Reports 	<p>20,000</p>
<p>Increased Spread of COVID-19</p>	<ul style="list-style-type: none"> • 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 	<p>Contractor/Project management committee</p>	<p>Throughout construction Period</p>	<ul style="list-style-type: none"> • Number of Handwashing facilities/sanitizers • No. of appropriate PPE (Face Masks) distributed • No. of trainings 	<ul style="list-style-type: none"> • Incidences reported • Reusable phase masks distributed • Hand washing facilities • Observance of social distance 	<p>20,000</p>

	<ul style="list-style-type: none"> • 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 cleaning commonly touched surfaces / objects 			<ul style="list-style-type: none"> • Vaccinations undertaken • No. of Covid-19 incidences reported • Number of persons working at the site 		
Gender based violence and sexual harassment	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • No. of cases of GBV reported • Number of sensitization workshops 	<ul style="list-style-type: none"> • Human resource policy in place • Code of Conducts signed • Separate sanitary convenience 	Contractor Cost
Child abuse	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Child Protection Strategy • Workers signing and committing to child protection strategy • Age of employees 	Contractor Cost
Sub-Total						60,000
Operation phase Environmental impacts						

Solid Waste generation from fish processing unit	<ul style="list-style-type: none"> • 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 Aquarech fish processing facility	Throughout operation	<ul style="list-style-type: none"> • No of Designed waste collection points established • -No of Waste collection companies engaged 	<ul style="list-style-type: none"> • Waste storage points • -Waste disposal facilities/contract collector 	50,000
Population Pressure and Water Demand for fish farming	<ul style="list-style-type: none"> • Develop schedule on water use for fish farming • Payment for water use so that funds can be used to sustain the processing facility 	Proponent Aquarech fish processing facility	Throughout operation	<ul style="list-style-type: none"> • Amount of Domestic water used in the processing facility 	<ul style="list-style-type: none"> • Reports • Field observation 	30,000
Water quality nitrate pollution by fish and feeds and use of fertilizers upstream	<ul style="list-style-type: none"> • Routine water quality analysis. • Train on safe use of organic fertilizers that are biodegradable upstream. • Fencing off the ponds to protect contamination 	Proponent Aquarech group	Throughout operation	<ul style="list-style-type: none"> • Length of perimeter fencing • Analysis of the water samples • Number of farmers trained on use of organic fertilizers 	<ul style="list-style-type: none"> • Reports • Field observation • Farmers practising organic farming 	50,000
Oil spills	<ul style="list-style-type: none"> • Standard operating practices for application of oils lubricants on mobile equipment to be a minimum 15m from the fish processing facility 	Proponent Aquarech and the fish farming group	Throughout operation	<ul style="list-style-type: none"> • Amount of Oil and grease traps used 	<ul style="list-style-type: none"> • Records Register on machinery maintenance 	10,000
Possible breeding of disease causing vector due to the presence of the fish ponds Increase in water borne and other	<ul style="list-style-type: none"> • Provision of treated nets to the targeted communities -Equip health centres with drugs • -Provision of water treatment tablets 	Proponent Aquarech and the fish farming group	Throughout operation	<ul style="list-style-type: none"> • Number of targeted households provided with Mosquito nets, 	<ul style="list-style-type: none"> • Reports 	50,000

related diseases				<ul style="list-style-type: none"> Water treatment tablets and sensitized 		
Operation phase Social impacts						
Leadership issues in management	<ul style="list-style-type: none"> 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 Aquarech and the fish farming group	Throughout operation	<ul style="list-style-type: none"> Number of trainings conducted Number of meetings held No of reported grievances Periodic financial status updating 	<ul style="list-style-type: none"> Training of PMCs GRM mechanisms Periodic financial status update 	10,000
Conflicts on use of the cold storage facility	<ul style="list-style-type: none"> ✓ 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 • Educate all project stakeholders on the availability and use of the grievance redress mechanism in a manner that is understandable to all, 	Proponent Aquarech and the fish farming group	Continuous	<p>Number of reported cases on grievances</p> <p>Number of sensitization awareness creation workshops on GRM</p> <ul style="list-style-type: none"> Number of community members trained on GRM 	<p>Reports</p> <ul style="list-style-type: none"> Existing records 	10,000
Occupational Health and safety Hazards	<ul style="list-style-type: none"> ✓ 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. 	Proponent Aquarech and the fish farming group	Throughout operation	<ul style="list-style-type: none"> No. of accidents reported Number and types of PPE procured No. of sensitization meetings 	<ul style="list-style-type: none"> Reports on Safety records Reports on number first Aid Kits available Photos of signage sites 	50,000

	✓ Put Signage (Warning signs in strategic sites)					
Spread of Covid 19	<ul style="list-style-type: none"> • Sensitize the fish farmers and workers in the fish processing plant 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 Aquarech and the fish farming group	Throughout operation Period	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Incidences reported • Reusable phase masks distributed • Hand washing facilities • Observance of social distance 	20,000
GBV and Sexual harassment	<ul style="list-style-type: none"> • Integrate provisions related to sexual harassment in the employee COC in project management committee • 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. 	Proponent Aquarech and the fish farming unit	Throughout operation period	<ul style="list-style-type: none"> • Number of recorded cases • Number of sensitization workshops • Human resource policy 	<ul style="list-style-type: none"> • Code of Conducts signed • No. of cases of GBV reported 	20,000
Sexual exploitation and Abuse (SEA)	<ul style="list-style-type: none"> • Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff 	Proponent Aquarech and the fish farming unit	Throughout operation phase	<ul style="list-style-type: none"> • Number of recorded cases 	<ul style="list-style-type: none"> • Code of Conducts signed • No. of cases of GBV reported 	20,000

	<ul style="list-style-type: none"> 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; 			<ul style="list-style-type: none"> Number of sensitization workshops Human resource policy 		
Sub-Total						320,000
Decommissioning phase						
Air Quality Degradation due to dust and exhaust emissions	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> No. of workers sensitized PPE provided Frequency of watering 	<ul style="list-style-type: none"> Workers/vehicle operators sensitized on reduced emission PPE provided to workers Sprinkling of water 	30,000
Increased generation of solid wastes	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Recycling solid waste Rehabilitated site Designed waste collection points established Waste collection company engaged 	<ul style="list-style-type: none"> Quantity of waste Area rehabilitated No. of solid waste bins/receptacles Type of Waste 	30,000

Loss of livelihood	<ul style="list-style-type: none"> The impact is low as it is anticipated and can be mitigated by training farmers on other forms of business and other strategies 	Proponent	Continuous during decommissioning	<ul style="list-style-type: none"> Training on alternative business 	<ul style="list-style-type: none"> No. of trainings conducted 	20,000
Occupational Health and Safety Hazards	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Training of workers on safety Provision of PPEs Install first aid kits Reporting of incidents Set up sanitation facilities Designated routes for machinery and personnel 	<ul style="list-style-type: none"> 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
Spread of COVID-19 amongst workers	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Availability of SOP(s), Training material, PPE, sanitising facilities etc; 	<ul style="list-style-type: none"> 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)						520,000

6 CONCLUSION AND RECOMMENDATION

6.1 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.

6.2 Recommendations

Aquraech limited under public private partnership arrangement with the County government and fish farmers 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 fish farming unit project will lead to improved incomes, food and nutrition 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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8 APPENDICES

i) Copies of filled questionnaires

PROJECT: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF FISH FARMING UNIT IN GEM SUB-COUNTY AT YALA FISHERIES CENTRE.

The Ministry of Agriculture, Livestock, Fisheries and Cooperatives (MOAL, F&C), the state department of Crops through World Bank Funded Kenya Climate Smart Agriculture Project (KCSAP), intend to support the proponent AQUARECH LTD to construct a fish farming unit. The activities entail fish processing and bulking Centre in Gem Sub-County at Yaia Fish Farm. Establish a 1,000,000-fingerling capacity hatchery unit. 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
Odongo LUCAS	NGASH	0728542616

1. Gender
Male Female

2. Age of the Respondent..... 62

3. For how long have you known or worked with the Society(years)

Section B
Human Natural Environmental Concerns

1 Are you aware of the proposed fish farming (processing and bulking) unit
Yes No

2 Do you think the proposed construction/establishment of the unit 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 construction/establishment of the multipurpose fish farming unit

Yes No

If yes explain *N/A*

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

Positive	Negative
<ul style="list-style-type: none"> - able to store and sell fish later - Find the Market easily. - provision of quality fingerlings and feeds for farmers - Provide jobs for the community youth. - Employment creation - Enhanced food security & nutrition - bio-diversity conservation 	<ul style="list-style-type: none"> resposal of waste materials. Contamination of water quality. Conflicts over resources. - influx of people from outside seeking for jobs

5 Suggest mitigation measure for any negative impact that may result from implementing the project. *Digging of underground disposal areas.*

6 a) Do you anticipate any conflict or-complain against the proposed fish farming, processing and marketing project with respect to:
- water quality testing

• Land Yes No
If yes indicate..... *N/A*

• Water Yes No
If yes indicate..... *N/A*

• Public health and safety? Yes No
If yes indicate *N/A*

• Loss of livelihood? Yes No
If yes indicate *N/A*

• Cultural/heritage? Yes No
If yes indicate *N/A*

Others

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

i.

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..... *[Signature]*

Thank you for your cooperation.....

3

ii) *Minutes of public consultation meeting*



PUBLIC MEETING FOR THE PROPOSED CONSTRUCTION OF MULTI PURPOSE FARMING UNIT HELD ON 24th FEBRUARY, 2022 AT YALA FISHERIES CENTRE, AT 09:45 AM.

MEMBERS PRESENT

AGENDA

- Introductions and opening remarks
- Purpose of the meeting
- Construction of the fish processing unit Brief
- Concerns, Questions and Responses
- A.O.B. & adjournment

PRELIMINARY

The meeting started with a word of prayer from the youth representative Mr Brian Ochieng at 10:00hrs. The meeting was held at the proposed site Yala Fisheries Office on 14th February, 2022. The area Yala Fisheries Officer Dan Ongete welcomed the visitors from Siaya Kenya Climate Smart Agriculture office and Nairobi. He then introduced the County Project Coordinator for KCSAP

MIN. 1 - 24/2/2022: INTRODUCTION & OPENING REMARKS

The project coordinator Siaya County Mr Ating Willis welcomed the participants 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, the fish farmers and Aquarech fish farming limited

MIN. 2 – 24/2/2022: PROJECT BRIEF

The CESSCO Mr Benard Ayagah gave a brief highlight on the objective of the visit and the need to conduct an Environmental Social Impact Assessment on the proposed Aquarech cold storage fish processing facility Project.

He informed the participants that the proposed project is a public private partnership arrangement the proposed site located in a government owned land. The area is actually a fisheries centre which has fish ponds for demonstration. The participants were informed that KCSAP has three main projects as follows: Sub projects, Micro projects and Producer Organizations *Micro projects are being implemented in 6 wards of Siaya namely: Ugunja, Sidindi, West Sakwa, Yimbo East, North Uyoma West Asembo* KCSAP does support groups of 20 to 30 people. The project has five value chains: Sorghum, Honey, Fish, Poultry and Tomato.

The sub projects are being implemented in the entire county. In Yala KCSAP received only 2 proposals and they did not succeed

In siaya 10 sub projects were supported by KCSAP. 9 sub projects are water pans and 1 is a fish drying facility. Already 5 sub projects have been completed and handed over *Producer organiizations* Producer organizations are SACCOs or Cooperatives and they cover all the five value chains. The aim of the producer organization is aggregate t add value to products and provide support to markets In Siaya Five producer organization provided for support from KCSAP and they have been awarded funds under the Enterprise Development Fund (EDF)

The institutions

Raku Tomato

Bora Poultry

Siaya Honey

Siaya Fishereies

Got Agulu Fisheries

He reported that Aquarech wrote a proposal on how to partner with the government to construct a fish aggregation and processing unit.

MIN. 3 - 24/2/2022: ENVIRONMENTAL SOCIAL IMPACT ASSESSMENT (ESIA) SENSITIZATION

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

Article 10 and 232 of the constitution calls for public participation and nothing can be done without the aspect of public participation.

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

Objective of consultative meeting:

1. 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).
2. Disseminate and inform the public and stakeholders about the project with Special reference to its key components and description
3. Create awareness among the public on the need for the ESIA for the proposed project

Min 4- 24/2/2022: 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 construction and its related activities
Yes/No
2. Give opinion on the expected benefits from the 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
6. Suggest ways to resolve conflict, complain amicably
7. Indicate other issues relevant to the implementation of then project

MIN. 4 –24/2/2022: Positive Impacts Anticipated by members from the meeting

Mr James Odongo Nelius: Questioned why we cannot process our own local quality fish feeds instead of importing feeds. He reported that the project should be geared towards creating employment and enhancing the capacity of the youth

Mrs Agnes wanted to know How the local community will gain under public private partnerships arrangement and impacts that may arise on both social and environmental issues

Clemence Okero : welcomed the project but wanted to know how the processed fish will be conserved to reduce post-harvest losses that may result in dumping of spoilt fish

Lucas Omondi: . Appreciated that they will be having a designated place for aggregation of fish , processing and marketing but had reservation on waste disposal of solid and liquid from the fish facility He was informed that there will be a soak pit and a possibility of converting wastes to livestock feed
Masime : Appreciated the construction of the fish and he reported that there will minimal post-harvest loses once the plant becomes operational.

Dan From Aquarech: Was hopeful that the project will increase household incomes. He however, cautioned on the need for cooperation and ownership. He emphasized that in the past, the community members used to sell fish individually. There was no any collective marketing arrangement in place Lead Expert. Raised concern on the access road to the fisheries centre 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 - 24/2/2022: 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

Issues raised by the members	Brief explanation	Response
Employment	During construction, preference will be given to the locals with emphasis on the youth During operation phase employment will be generated by sale of fish, fish farming and disposal of products	The community agreed and promised to provide both skilled and unskilled labour
Erosion	Stakeholders residing around the project site (demonstration ponds) 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 revived fish ponds will be installed with fish that can eat mosquito larvae The surrounding community members will be provided with mosquito nets	The 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 fish processing facility	An account for the facility be established for running the funds collecting whenever there are breakages	A sustainability strategy to be put in place so that maintenance issues can be addressed by a committee which has a funding mechanism
Theft of fish equipments i.e solar panels	There was a concern that there will be theft and vandalism of equipments	The Aquarerch, County govt and Community to engage the youth in maintaining and running the fish farming facility
How will foul smell from the facility be managed	Fresh fish will be aggregated and kept in refrigerated facility to avoid spoilage and reduce post-harvest loses	It was agreed that fish once received will be processed within 30minutes and then kept in cold storage facility, It will also be sold out to the private partner (aquarech) for marketing
Fire Out breaks	There will be fire drills	There will be a fire assembly point and fire extinguishers will be placed at strategic entry and exit points of the facility

MIN 6 - 24/3 /2021: SUGGESTIONS FROM MEMBERS IN ATTENDANCE

The community recommend that capacity building be done to them and be supported with fish feeds for fish farming

The community requested that there be integration of the youth and elderly in operationalization of the public private partner aquarech fish enterprise

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

The fish 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 – 24/2/2022: A.O.B AND ADJOURNMENT

There being no other business, the meeting ended with a word of prayer from Agnes Ogada at 14.00hrs.

Signed by:

Mr. Elijah Levo

Environmental and 24/2/2022
Social Consultant



iii) Public participation attendace list



Kenya Climate Smart Agriculture Project (KCSAP)



Office of the CPCU - Siaya

REGISTRATION FORM

ACTIVITY: PUBLIC PARTICIPATION AT YALA/AQUACULTURE SITE DATE: 24/02/2022

NO	NAME	ORGANIZATION	DESIG	CONTACT		SIGN
				MOBILE	EMAIL	
1.	MARY OIKISA ASUKO	East Gen	Farmer	0722306420	maryasikel941@gmail.com	
2.	Lucas Odongo	N/Gem.	Farmer	0722546616	lucododongo49@gmail.com	
3.	Samuel Okello	North Gen	Farmer	0722421436	okellos32@gmail.com	
4.	LUCAS OMOLO OCHIAI	EAST UEM	FARMER	0721549135	luckomollo@gmail.com	
5.	FRANCIS .O. MASIME	EAST GEN	FARMER	0721612126	francismasime@gmail.com	
6.	Daniel Ougele	Fisheries	AFD I	0729348642	dano22006@gmail.com	
7.	Edwin O. Ojogi	N/GEM	Farmer	0725949291	—	
8.	SALOME AMBO	FISHERIES	F.O	0712346383	ksalome@gmail.com	
9.	JAMES OBOGGA NELLUS	N. Gem	Farmer	0721247412	—	
10.	Dano Ochele	AQUACULTURE	BR	0721985145	dano0808@gmail.com	



Kenya Climate Smart Agriculture Project (KCSAP)

Office of the CPCU - Siaya



REGISTRATION FORM


ACTIVITY: MEEETING ACQUISITION OF MC MEMBERS

DATE 22/02/2022

NO	NAME	ORGANIZATION	DESIG	CONTACT		SIGN
				MOBILE	EMAIL	
1.	MICHAEL MINUDA	WARD OFFICE YALA	P.A	0728674398	michaelminuda@gmail.com	
2.	EDWIN CHINT MALIBYA	WARD OFFICE YALA	WARD MANAGER	0726940057	edwinmalibya@gmail.com	
3.	George Owin Ogola	North Gem	Farmer	0717481550		
4.	JOSEPH OTENO OBIANG	EAST GEM	FARMER	0724007085		
5.	JOSEPH OKEYO OLIK	N. GEM	FARMER	0725647297		
6.	BRIAN OTIENO OMBODO	EAST GEM	FARMER	0724383210	oti1006@gmail.com	
7.	Agnes Ogada	EAST GEM	FARMER	0727452929		
8.	PETER OTIENO	N. GEM	FARMER	0707859847		
9.	KELMENZ OKERO OTIENO	N. GEM	FARMER	07110528485		
10.	MAURGEN AKHONG OMBANGU	N. GEM	FARMER	0719516531		

v) Title Deed

vi) Screening Checklist



Producer Organization Screening Checklist 2022

Section A: Background information

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

Name of CPCU/NEMA... VIOLET ATIENO.....

Producer Organization Ward... YALA TOWNSHIP.....

Name of CBO/Institution... AQUA RECH.....

Contact Person... DANIEL ONSIETE cell phone... 0742443317, 078169546

Producer Organization name... AQUA RECH.....

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

Approximate size of land area available for the producer organization... 1/2 ACRE

Objectives of the producer organization... RESERATION & COLD STORAGE

Activities/enterprises undertaken... AQUACULTURE

How was the producer organization chosen?... ITS PRIVATE PUBLIC PARTNERSHIP FOR FISH PRODUCTION

Expected producer organization duration... 1 YEAR.....

Section B: Environmental Issues

	Yes	No
Will the producer organization:		
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

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

Section D: Natural Habitats

	YES	NO
Will the producer organization:		
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 producer organization:		
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.)?		

h) If YES, what kind? _____

2. Knowledge of pesticide handling and storage (tick one in each row)

a) Do you read labels on the pesticide container before using?
Sometimes _____ Always _____ Never _____

b) How often do you wear protective clothing and other accessories like nasal mask, eye goggles, and boots when applying the pesticides?
Sometimes _____ Always _____ Never _____

c) Do you mix pesticides with your hands?
Sometimes _____ Always _____ Never _____

d) Do you observe the pre-harvest waiting periods after applying the pesticides?
Sometimes _____ Always _____ Never _____

e) After spraying, do you wait 12 hours before entering the field?
Sometimes _____ Always _____ Never _____

f) Do you store pesticides in a secure, sound and well-ventilated location?
Sometimes _____ Always _____ Never _____

g) Do you make a cocktail before applying the pesticides? (i.e., mix more than one chemical and apply them at once?)
Sometimes _____ Always _____ Never _____

h) Where do you store your pesticides? _____
Why do you store them there? _____

i) What do you do with your pesticide containers after they are empty? _____

j) Do you know of any beneficial insects (insects that are useful)?
Yes..... No.....

k) If yes, name them:
i) _____ ii) _____ iii) _____

3. Pesticides and Health

a) Do you find that pesticide application is affecting the health of: Persons regularly applying pesticides?
Sometimes _____ Always _____ Never _____

Persons working in fields sprayed with pesticides
Sometimes _____ Always _____ Never _____

Persons harvesting the produce
Sometimes _____ Always _____ Never _____

4. Options to Pesticides

a) From your experience, are you aware of other methods for controlling insects/diseases and/or weeds besides pesticides?
Yes..... No.....

b) If yes, describe the practices:
i) _____
ii) _____
iii) _____
iv) _____

5. Information

a) What information do you think you need for improving your crop production and

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 IPME

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/weeds controlled	Number of times applied/season	When did you apply (give with stage or month) Quantity purchased

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?

Yes No _____

Why? _____

Result in involuntary restriction of access by people to legally designated parks and protected areas?		
Be on monoculture cropping?		

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

Section H: Proposed action

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

(iii) Recommended Course of Action

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

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

Expert Advice

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

Completed by: DANIEL ONKETE
 Name: [Signature]
 Position / Community: FISHERIES OFFICER CEM

Date: 14/07/22
 Field Appraisal Officer (CDE): William Odeyo
 Signature: [Signature]
 Date: 14/2/22

vii) ESIA Practicing License



FORM 7

(15/2)

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT
ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE
License No : NEMA/EA/EPPL/15368
Application Reference No: NEMA/EA/EL/21343

M/S Fredrick Ouyango Alon
(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: 1/17/2022

Expiry Date: 12/31/2022

Signature.....

(Seal)
Director General
The National Environment Management
Authority



viii) Photo of participants raising their hands in appreciation of the project



Plate 8-1 Participants raising their hands in appreciation of the project