ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FULL STUDY REPORT FOR THE PROPOSED OYSTER FARMING PROJECT IN GAZI AREA OF MSAMBWENI SUB-COUNTY, KWALE COUNTY

GPS Coordinates: 4°26'58"E and 39°30'25"S

Proponent

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MAY, 2023

CERTIFICATION

CERTIFICATION

EIA Lead Expert

This Environmental and Social Impact Assessment (ESIA) study project report for oyster farming has been prepared by a team of EIA/EA practicing experts with reasonable skills, care and due diligence in accordance with the Environmental Management and Coordination Act, 1999 *(Revised 2015)* and the Environmental Impact Assessment and Audit Regulations, 2003.

We hereby certify that the contents as reported in this report are correct to the best of our knowledge.

Name: Joseph Tunje ..... Signature: .....

NEMA EIA/A Reg. No. 290 ..... Date: 21/5/2023 .....

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Name: ..... Signature: .....

NEMA EIA/A Reg. No: ..... Date.....

Proponent

I Gloria Muthau Justin ..... being representative of SWAHILI COAST FARMS LIMITED, do hereby confirm that this study report has been forwarded to NEMA with my approval as the project proponent. I confirm my commitment to implement the Environmental and Social Management Plan as provided herein.

Name Gloria Muthau Justin Signature .....

Designation Managing Director Date 31st May 2023

Official Rubber Stamp:

Estimated Project Cost: **KShs. 10,040,700.00**

SWAHILI COAST FARMS LTD. 31 MAY 2023 GAZI, UKUNDA

ACKNOWLEDGEMENT

It is worth acknowledging all people who contributed to the successful undertaking of this Environmental Impact and Social Assessment for the Gazi oyster farming project and the subsequent compilation of this project report.

First and foremost, we greatly express our gratitude to the Proponent, Coast Swahili Farms Limited for providing all the necessary logistical support during the assessment. In particular, we wish to appreciate the Proponent's representative, Ms. Gloria Mutheu for the valuable support provided throughout the assessment including giving the Consultant valuable information about the project.

We would also like to acknowledge with gratitude the Gazi BMU Chairman, Mr. Jumaa and the entire BMU assembly for their cooperation and logistical support. It is the BMU that organized the public baraza and that was held in their facility. The BMU also mobilized community members in the village who spared their valuable time to participate in the public meeting. For this, we say thank you.

I appreciate the participation of all household heads who participated in the household surveys exercise for providing their valid views and concerns about the project; and through this, important information were collected that was very useful in the drafting of this report. Thank you Ms. Saumu Ali and Mr. Shikeli Idd for your good work in the administration of the questionnaires.

The findings and recommendations found herein are based on the EIA Team's understanding, observations, analysis and interpretation of data obtained based on the terms of reference provided by the Proponent, Swahili Coast Farms Limited.

To you all who participated in the realization of this EIA project report, we highly appreciate your kind cooperation, contribution and support. Thank you all.

LIST OF ACRONYMS

ESIA	Environmental Social and Impact Assessment
EIA	Environmental Impact Assessment
EA	Environmental Audit
EMCA	Environmental Management and coordination Act (1999)
EMP	Environmental Management Plan
NEMA	National Environmental Management Authority
OHS	Occupational Health and Safety
WIBA	Work Injuries Benefits Act
PPEs	Personal Protective Equipment's
WRMA	Water Resources Management Authority
HS	Household Surveys
KI	Key Informant Interviews
EHS	Environmental Health and Safety
HASP	Health and Safety Plan

EXECUTIVE SUMMARY

Swahili Coast Farms Limited, a registered company engaged EIA/EA experts to undertake an Environmental and Social Impact Assessment for the proposed oyster farming project in part of the sea in Gazi. This summary project report presents findings of the Environmental and Social Impact Assessment undertaken for the project. The oyster farming project will be undertaken on a 10 ha community owned land/sea in Gazi village, Msambweni Sub-County, Kwale County. The project lies at GPS location 4°26'58"S and 39°30'25"E, and its implementation is poised to economically impact about 350 in the area.

The project will focus on farming of oyster (*Crassostrea gigas*) using the long line and cages methods. The spat (oyster seeds) with imported from Europe and will be delivered with health certificates. It is worth noting that, since oyster are filter feeders, no feeds, antibiotics or chemicals will be used, thus the project will be environmental friendly.

A total of 25 people drawn from the local community will be employed (10 on permanent basis, while 15 will be casuals) working at different stages in the production process from harvesting, processing to marketing of the product.

A critical analysis from the environmental and social point of view reveals that immense positive impacts that include creation of employment opportunities, improved household and fisher incomes, increase in the abundance of fish population among other. The negative impacts of the project included displacement of fishers from their fishing ground, possibility of vandalism of project infrastructure, occupational hazards including drowning, among others.

The negative impacts are minimal and localized, and sound environmental safeguards have been built into the ESIA project report to cushion the biophysical and socioeconomic environment against the likely adverse impacts. The Environmental Management and Monitoring Plan (EMMP) has also been prepared and discussed with the proponent for implementation. It is against this background that this ESIA project report is being submitted for review, approval and issuance of a license for the project to commence.

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1.0 INTRODUCTION AND BACKGROUND INFORMATION

1.1 Introduction

The proponent, Swahili Coast Farms Limited (SCF) is a private firm established in 2022 and intends to operate within the coast region. The specific headquarters are in Gazi, Msambweni sub-county. The firm consists of staff that has served in the fisheries sector for an average of nine years. Following their experience and passion to exploit the opportunities embedded in the fisheries sector, the company intends to utilize the pristine ocean water for sustainable oyster farming. In the operation, the proponent shall rear the Pacific Oyster (*Crassostrea gigas*) in the waters near the Gazi BMU landing site.

Located about 1.5 kilometers from the shoreline, the proposed project site lies midway between Gazi landing site and Chale Island. Additional, to the good quality of water, the site's ocean bed slopes gently, relatively manageable wave and tidal energy, easy to monitor and has a welcoming local community. The proponent intends to apply both the cage and suspension culture methods with no artificial feeding, no addition of fertilizers, chemicals or introduction of antibiotics to the marine environment. The current area has a required depth of water (averaging 10 meters deep). With the above conditions and operations, the farm shall be sustainable.

Owing to the use of a triploid spat, oysters shall be available throughout the year in a variety of sizes, thereby meeting the current market demand in the region. It will take six months for the oysters to grow to market size unlike the wild ones which take 18-30 months to reach market size (FAO, 2016). This will enable the proponent to harvest 12,000 oysters per week in the first phase (0-6 months). In the second phase (6-12 months), they will harvest 24,000 oysters a week and 48,000 oysters a week in the third phase (12-18 months) which will see possible increase in the area under cultivation and a market reach across the East African region.

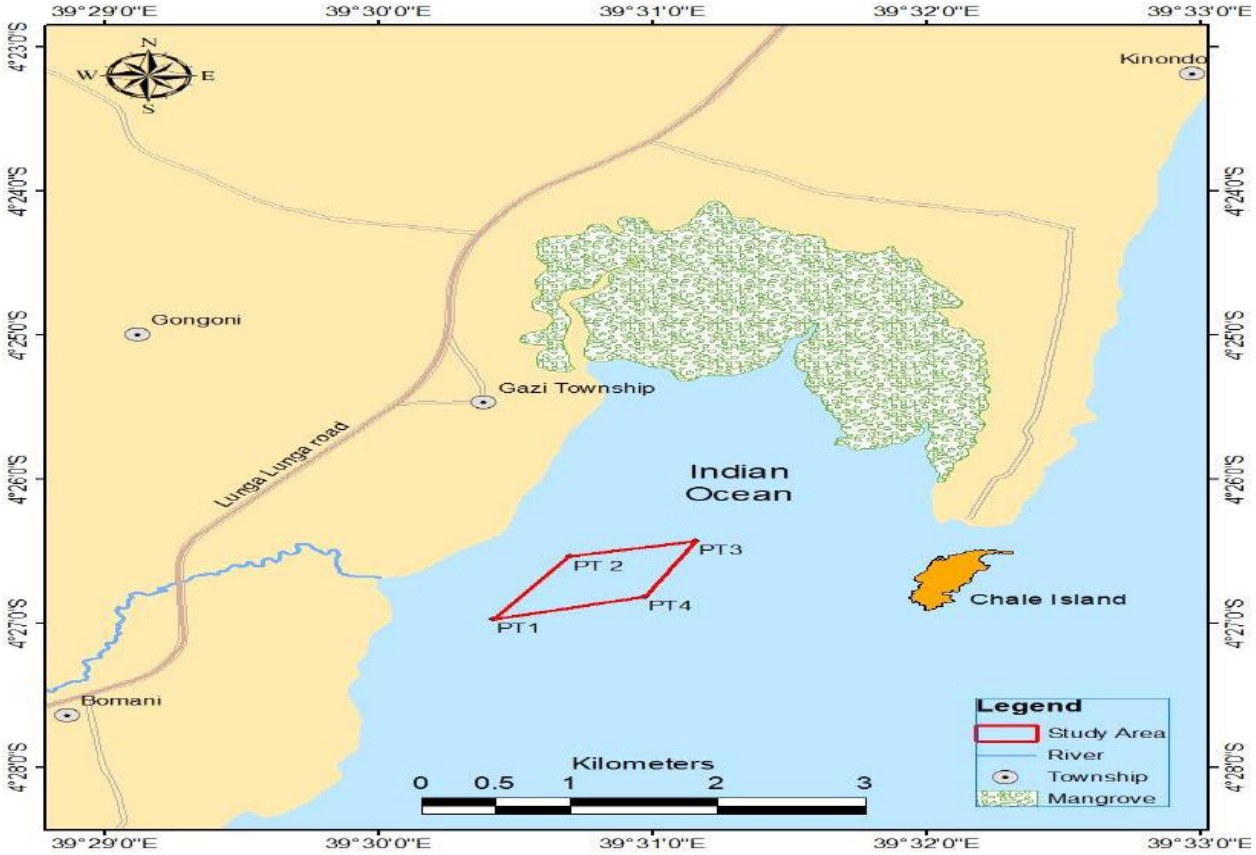


Figure 1: Proposed Project Location (Source Author)

1.2 Background and Rationale of the ESIA study Report

Since this sis a new program on the open sea utilization, there are impacts anticipated on the environment, members of the ocean common, and the economic orientation of the place. The current use of the proposed area is on wild fishing, recreation and sailing. The introduction of a triploid oyster culture is certainly likely to cause a change of use of the marine area in question. Whereas the project intends to pioneer the potential of marine waters in curbing the food security challenge and other snow-balling benefits, due diligence needs to be done for ecosystem safety. Like other wetlands, the marine wetland ecosystem is one of the most delicate habitats. A slight change on the ecosystem can affect many critical species. In addition, there are anticipated effects on the socio-economic spheres of the people lining in both Gazi and its environs. Such a project, therefore, falls within the Second Schedule of EMCA 1999 (amended in 2015) where such projects should undergo Environmental Impact Assessment (EIA).

1.3 The Proposed Project

The project entails the setting up of a 0.1 km^2 (10-hectare) oyster farm on the leased ocean area between Gazi BMU landing point and the Chale Island. During the piloting phase, the proponent intends to culture

the Pacific Oyster (*Crassostrea gigas*) on a 0.06km^2 part of the leased 0.1 km^2 hectares which will be increased as the project gets momentum. While the other part of the leased open water shall not be in use for some time, the fishermen will be allowed to fish in that space. The spat shall be imported from tested European farms. Unlike other culture techniques, the intended suspension and cage cultures will not feed the spat with any foreign material. It will rely on the filter-feeding nature of the mollusks for growth up to market size. After installation of the culture structures, the personnel shall be visiting the site for monitoring, and maintenance on daily routine practices.

The project is designed to have three production phases as indicated below:

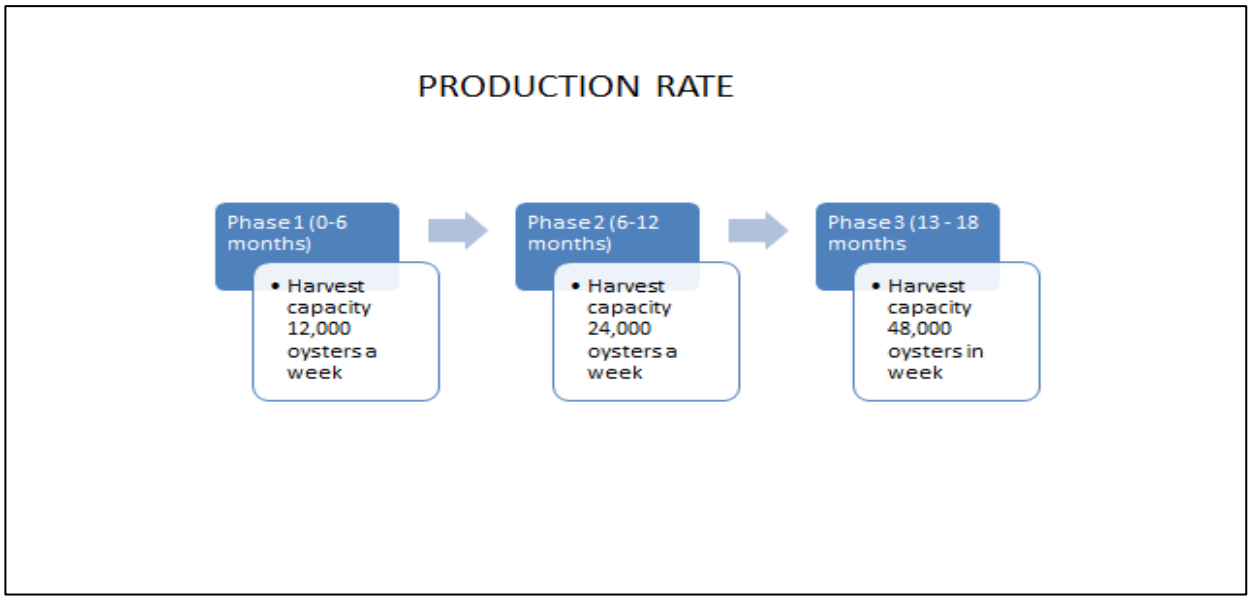


Figure 2: Production Phases

In Phase 1 (0-6 months) of the project, it is expected that 12000 oysters will be harvested and the production rate will gradually increase to 24000 oysters in Phase 2 (6-12 months) and to 48000 in the 3rd Phase (13-18 months) of the project. The project will have a 6-months production cycle.

To avoid possible tampering from sea activities a well labeled perimeter shall be established with a buffer around it. It is expected that the oyster grow-out bags shall act as Fish Aggregation Devices (FADs), the fishermen shall be allowed to do monitored fishing within the buffer zone.

To start with, the target market for the harvested oyster will be mainly hotels and restaurants at the coast, seafood restaurants across the country and 5-star hotels that serve a wide array of cuisines, and after 1 year of production, it is expected that market will expand to hotels within the East Africa region, particularly in Zanzibar and Dar es Salaam, and expected to expand further to include the European market
After the third phase of culturing, the project will put another focus on training the local people on oyster farming and a scholarship program to show the local community the potential available in the sector thereby fostering a steady and sustainable economic growth.

1.3.1 Goals of the project

The project is expected to:

i. Meet the market demand of oysters in big hotels in the world market;
ii. Contribute to food security and tourism and;
iii. Steer up sustainable utilization of marine resources.

1.3.2 Specific Project Objectives

In order to achieve these goals, the specific objectives of the project are as follows: -

i. To establish an oyster farm on the proposed project area;
ii. To establish a marketing system that will open Kenya's exportation of oysters, and
iii. To train and support the local BMUs and sea grass farmers with an aim to make them self-reliant in seafood culture and exploitation.

1.3.3 Justification of the project

Among the requirements for a prosperous oyster farm, the nature of tides, waves, temperature, salinity, accessibility of the offshore farm and gradient of the continental shelf, the Gazi area is well endowed with necessary accompanying infrastructure such as roads and telecommunications network. Routine maintenance required on a daily basis has to involve use of a boat and diving services. All these needs are met by the prevailing baseline nature of the place, thereby making it cheaper and convenient to establish operations in the area.

It is estimated that USD 2.5 trillion contributed into the global economy comes from the marine ecosystems. The Kenyan Indian Ocean contributes a GDP of USD 4.4 billion annually, which is only 0.176% of the global output. There is an indication of low utilization of the available "blue capital" to leverage on the boost on local economies. The current proposal is one of the FAO approved ocean use practices that can greatly aid in reduction of hunger and poverty levels in ocean-served nations. It is the goal of the proponent to enhance ripple-effect in investment in oyster and other seafood farming and sustainable harvesting of marine resources in the clamor to shift the ocean use towards the recommendations of the Blue Economy Agenda.

In Kenya, there are conversations and concerted efforts that are geared to lift the burden of unemployment. It is true that there is unexploited talent in the country due to shortage of opportunities to use the. Part of the considerations made by the proponent is to grab the opportunity and provide the local people with some job opportunities, an initiative that will help ease poverty levels in the region. Based on the productivity of the project, there will be more specific capacity building on labour force to generate utility that is needed in oyster farming. This will not only shift the artisanal fishermen to more productive income generation activities but also open the country to more opportunities lying within the continental shelf. As men participate in diving, installation and maintenance of the culture infrastructure, the women will be sorting, grading and packaging the produce.

From the baseline studies, the project has been greatly welcomed by the general community members in Gazi because of the anticipated benefits. This is also a milestone that will play a big role in enhancing the presence and maturity of the project. Other ocean use activities such as sea-grass harvesting and fishing activities will largely go on undisturbed.

1.4 Need for an ESIA study

The proposed project falls under the EIA mandatory activities listed in the second schedule of Environment Management and Coordination Act (EMCA Amendment) No 8 of 2015. The oyster farm constitutes a major change in the current ocean use, and will establish a single-species farm. It is in common knowledge that this foreign use is likely to cause some disturbance in the normal operations of the marine ecosystem. Waste materials from the establishment and maintenance of the cages and suspension systems are likely to find their stay within the marine ecosystem. Keeping in view the need for workers' health and environmental problems associated with the oyster farm, it becomes necessary and important to develop cleaner and safer production scheme to mitigate hazardous impact on marine ecosystem and human health due to regular exposure to potential ocean accidents that can lead to drowning and physical injuries, ecosystem change and possible loss of aesthetics. Location of the proposed Oyster Farm is based on an area characterized by various land and ocean uses and socio-economic activities. These land utilizations may be adversely affected if environmental feasibility of the proposed project is not appropriately determined. It will also result in marine pollution that is dangerous unless well taken care of. Section 58 of EMCA, 2015, amendment requires that such projects be subjected to EIA.

1.4.1 Objective of the ESIA

The general objective of this ESIA is to carry out a systematic examination of the present environmental situation within the project area to determine whether the proposed project will impact adversely on the social, physical and biological elements of the environment within the project area. This is in line with Section 58 (1) of EMCA 1999 that requires project proponents to carry out ESIA on projects that appear in the Second Schedule of the Act".

1.4.2 Specific Objectives

Specific objectives for this study are to:

a) Identify; examine and analyze all the significant environmental and socio-economic impacts related to the proposed Swahili Coast Farms' Oyster project.
b) Carry out baseline surveys of the existing environmental, social and economic parameters in the project area upon which the ESIA Study is based.
c) Identify, examine and analyze existing policies and institutional provisions for effective implementation of the proposed project.
d) Analyze specific project alternatives in terms of site, technology, design, scale, size and extent.

e) Provide workable mitigation measures for specific anticipated impacts on the proposed project area.
f) Develop an EMP with specific actions, responsibilities, time schedule and costs.
g) Make appropriate conclusions and recommendations.
h) Ensure adequate consultation and public participation throughout the EIA process.

1.5 Scope of the study

A project proponent is required to undertake an Environmental Impact Assessment study before undertaking any project highlighted in Schedule 2 of the Environmental Management and Coordination (Amendment) Act, 2015. This study undertakes to fulfill the requirement. This report is necessary at the planning stages of the undertaking to ensure that significant impacts on the environment are taken into consideration during the design, construction, operation, and decommissioning of the farm. The scope of the ESIA was to undertake the following key tasks:

1.5.1 Detailed desk-top review

This involves review of existing documentation especially the EIA Project Report and then providing a concise description of the proposed Oyster Farm. These include its geographic, ecological, general layout of facilities including maps at appropriate scale where necessary. Also, information on size, capacity, facilities and services should be provided.

1.5.2 Description of the baseline environment

This involves collecting and documenting the baseline information on the environmental characteristics of the existing situation in the proposed oyster farm site and its immediate neighborhood. This description will consider:

a) Physical environment which include topography, soils, land cover, land use, climate, hydrology and drainage.
b) Biological environment comprising of flora and fauna types and diversity, endangered species, sensitive habitats.
c) Social and cultural environment present and projected population, land use, utilization of ocean resources, planned development activities, community social structure, social services, road networks, employment and labour market, main sources and distribution of income, cultural/religious sites and properties, vulnerable groups of the populations.
d) Economic activities practiced in the proposed project area.

1.5.3 Occupational health and safety concerns

The Consultant will analyze and describe all occupational health and safety concerns brought about by activities during all the phases of the project. The experts are also expected to make plausible recommendations on corrective and remedial measures to be implemented under the EMP.

1.5.4 Determination of impacts of project facilities and activities

In reference to the detailed baseline environmental assessment, the EIA Experts commit to analyze and describe all significant changes brought about by each project activity. These shall cover environmental, ecological, economic and social impacts, both positive and negative, as a result of each activity or interventions that are likely to bring about changes in the baseline environmental and social conditions. The experts shall make a prioritization of all concerns identified and differentiate between short, medium, long-term and cumulative impacts during construction, operation and decommissioning phases. The experts will also be keen to distinguish temporary and permanent impacts resulting from project implementation.

1.5.5 Proposing project alternatives

Project alternatives regarding site, technology and resource allocation shall are essential to enhance flexibility and avoidance of possible deleterious impacts of proposed projects. Just like any other proper planning tool, ESIA must therefore give options that can be pursued in order to get sustainable results. Alternatives in this project have been looked at in terms of site, technology, design, scale and extent. Comparison of the project dimensions with the proposed project generates the best project option.

1.5.6 Legislative and regulatory framework

The proposed project shall be executed within the provisions of legal and regulatory frameworks that are applicable or related to the sector. The experts shall identify and describe the pertinent and relevant regulations and standards for the be the proposed oyster farm - both local and international, governing the environmental quality, health and safety, protection of the sensitive marine sensitive areas, land use control at the national and local levels and ecological and socio-economic issues. The project activities that comply with the identified regulations shall also be detailed.

1.5.7 Development of management plan to mitigate negative impacts

The experts are expected to develop a comprehensive environmental management plan. The plan would recommend a set of mitigation, monitoring and institutional measures to eliminate, minimize or reduce to acceptable levels of adverse environmental impacts and/or maximize socio-economic benefits. The experts shall then provide details on the institutional, time frame and responsibility for long term environmental management of the proposed oyster farm.

1.5.8 Development of an environmental monitoring plan

The experts shall give a specific description, and technical details of environmental monitoring measures, including the parameters to be measured, methods to be used, monitoring locations, and frequency of monitoring.

1.5.9 Description of the proposed oyster project

The company's operations shall entail: -

a) Mapping and zonation of the proposed project site
b) Construction of Suspension and Cage Culture Systems
c) Installation of Suspension and Cage Culture Systems
d) Daily monitoring and surveillance of the project infrastructure
e) Establishment of an off-shore office together with a Packing and cold Storage Centre.
f) Other Project Components
    - *Education on sustainable fishing*
    - *Marine research*
g) Provision of Social amenities and other benefits to the community.

1.5.10 Preparation of Environmental and Social Impact Assessment Study Report

The experts shall submit the report for approval to NEMA. They shall be responsible for making any improvements that the authorities may demand before approval of the report and consequently, issuance of an EIA License.

1.6 Roles and responsibilities

Success of this ESIA process was made possible through cooperation of the project proponent and the ESIA experts. The proponent, Swahili Coast Farms provided resources for the carrying out of the ESIA study and also provided the relevant information on project design and processes. The ESIA consultant carried the ESIA study in compliance with applicable rules and regulations and assumes responsibility for data and information contained in this report.

CHAPTER TWO

2.0 PROJECT DESCRIPTION

2.1 Nature of the Project

The project involves the establishment of an oyster farm along the continental shelf of the Gazi area which is between the BMU landing site and the Chale Island. To culture the oysters (*Crassostrea gigas*), the proponent intends to use cage and suspension methods where the mollusks will feed by filtration. There will not be any introduction of feeds or drugs to potentiate the growth. The activity shall sit on a 10-hectare surface of water with a buffer of 50 around the boundary. Main activities during the project initiation will be construction and installation of the cage and suspension systems that will hold the spat in place until they grow to market sizes. Monitoring and evaluation will be done by skilled personnel in fisheries while hiring divers who would reach the lower parts of the water column to collect desired information.

2.2 Project Components

For the project to meet its objectives, different components shall be assembled. They include;

2.2.1 Cages and Long lines

Cages are one of the commonly used growth vessels in oyster rearing. The triploid spat will be held within these cages to full growth in each cycle. All oyster cages are built with heavy duty extruded high density polyethylene mesh. The oyster growing cages are assembled with aluminum clips, elastic straps and nylon harnesses. The high quality oyster cages can be used in water for more than seven years. These level of durability helps reduce the amount of project decommissioning waste per unit time. For ease in monitoring and evaluation, the cages will be arranged in equidistant rows and columns, a feature that additionally helps in boosting the aesthetics of the area. Where long lines shall be deployed, similar arrangement shall be used.

Figure 3: Oyster Culture Cages

Figure 4: Long Line Culture Cages

2.2.2 The Spat

With the current shellfish shortages in Kenya and East African region, the challenge is caused by the slow maturity of wild harvests and the length of time wild species take to mature. The Swahili Coast Farms shall import a triploid spat that shall be cultured to yield after every six months. The *Crassostrea gigas* shall not reproduce meaning it will not have to go through the long reproductive stages. To avoid the challenges related with feeding and caretaking of the oysters, the breed shall purely filter-feed to maturity. The species shall be outsourced from the tried and tested European farms and it shall be accompanied by necessary health certificates. A spillover of benefits to the marine ecosystem will be experienced such as filtration of the water in the area and creation of fish aggregation sites especially from the hanging lanterns. These features are engineered to make the production process as eco-friendly and sustainable as much as possible.

2.2.3 Human Resource

Since the practice is one of its own in the region, there shall be a top-class advisory unit consisting of well experienced personnel in the sector. The team shall consist of a board of directorship that has collective experience in aquaculture including project setup, oyster farming, and management. The other pertinent staff shall be oyster farmers, project manager, an accountant, marketing specialists, and divers. From time to time, other casual workers shall be sourced to help with seasonal work that includes harvesting, sorting, grading, packaging and storage. Also, the project staff shall increase with the increment in the area under culture.

Cognizant of the possible project-community related conflicts, the proponent is committed to sign a memorandum of understanding between the BMU and the proponent wherein there shall be a labour sharing formula. In the proposal, the proponent has an objective of sourcing all employees with required skills from the community as much as possible. Being a fishing community, the divers, sorting and

depuration can be easily done by the local workforce. In return, the local community is expected to own and protect the project for then to benefit from its maturity.

2.2.4 Offshore facilities

The proponent intends to have an offshore office and a cool storage room for the produce. These premises shall be rented from the pre-existing BMU landing facility. The proponent shall also put up a culvert bridge through the creek separating the landing point from the mainland. This shall be a benefit for the Gazi BMU since most part of their offices are not in use. Other settlement premises shall be rented within Gazi trading center for the routine practice officers. Power to run office duties shall be in the short term be sourced from solar cells because there is no connection with the national grid at the BMU facility as plans shall be established with the KPLC. The solar panels shall keep serving as back-up providers in the clamor to reduce the carbon footprints of the project operations and the cost of operation.

2.2.5 Marketing Infrastructure

Since oyster farming, harvesting, trade and consumption is a generally uncommon in Kenya and East Africa, the proponent has forethought a well-structured marketing system that shall be used to ensure awareness and appreciation of oysters as a potential solution to food security, job scarcity and bridging the trade deficit in the region. These efforts are intended to encourage people to take up the opportunity of oyster farming and source both local and international markets for the produce. This is a very critical component of any production and supply chain in any business that lack of it may render any of such efforts obsolete. While advertising the products, the proponent shall do so according to regulations of both the local counties and national governments.

CHAPTER THREE

3.0 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS

3.1 Project location and climatic conditions

The proposed oyster farming will be done in Gazi Village of Msambweni Sub County within Kwale County, about 48 kilometers by road. The project site is located at GPS coordinates 4°26'58"S and 39°30'25"S covering an approximated area of 10 hectors. It is about 2 kilometers in to the sea from Gazi landing site and overlooking the Chale Island. Much of the baseline information given herein, unless otherwise stated, is for the wider Kwale County.

Kwale County is one of the six counties in the coastal region of Kenya. It borders Taita-Taveta County to the North West, Kilifi County to the North and North East, Mombasa County and Indian Ocean to the East and South East and the United Republic of Tanzania to the South West. The County is located in the Southern tip of Kenya (Figure 1), lying between Latitudes 30.05º East to 40.75º south and Longitudes 38.52º to 39.51º east. Kwale County covers an area of about 8,270.2 Square Kilometers, of which 62 is water surface. The area excludes the 200 miles' coastal strip known as the Exclusive Economic Zones (EEZ).

Gazi project site, just like the coastal region of Kenya, has a tropical type of climate influenced by the monsoon seasons. The average temperature is about 23°C with maximum temperature of 25°C being experienced in March during the intermonsoon period and minimum temperature of 21°C experienced in July a month after the start of the southwest monsoon (Kusi season).

The area has a bimodal rainfall pattern with short rains coming from October to December, while the long rains are expected from April to July. The heaviest rainfall amount of about 1000 mm per annum is experienced along the coastline, which decreases towards the hinterland up to an average of about 500mm.

3.2 Topography

Kwale County can be divided into four topographic features, namely

3.2.1 The coastal plain

The Coastal plan is sometimes referred as the "coral rag". It is a narrow strip of land, three to 10 kilometers wide, with a distance of approximately 255 kilometers from Likoni to Vanga. It lies 30 meters above sea level and extends 10 kilometers inland. This strip of land consists of corals, sand and alluvial deposits. The Gazi Oyster project falls within this topographic feature.

3.2.2 The foot plateau

Behind the coastal plain is the foot plateau. It lies at an altitude of between 60 and 135 meters above sea level on a flat plain surface with high potential permeable sand hills and loamy soils. This is the sugar cane zone of the region.

3.2.3 The coastal range/uplands

Commonly known as Shimba Hills, the area rises steeply from the foot plateau to an altitude between 150 meters and 462 meters above sea level. This topographical zone is made up of many sandstone hills. The hills include Shimba Hills (420m), Tsimba (350 m), Mrima (323m) and Dzombo (462m). This is an area of medium to high agricultural potential.

3.2.4 The Nyika plateau (hinterland)

This zone stands at an altitude of about 180 to 300 meters above sea level on the western boundary of the region. The zone is underlain by a basement rock system with exception of reddish sand soils. Occupying over a half of the region, it is semi-arid with the exception of occasional patches of reddish sand soils and is, therefore, generally poor. The main activity in the area is livestock rearing.

3.3 Draining

The County is well drained by seven major rivers and numerous minor streams, three of which are permanent rivers while four are seasonal, all of which discharge their waters into the Indian Ocean. These rivers are Marere, Mkurumudzi, Pemba, Mwachema, Umba, Ramisi and Mwache.

3.4 Demographics

Kwale County, with an area of 8270.30 km^2 has a population of 858749 (2019 Population Census) with a population density of 103.84 persons/km^2 and an annual population growth rate of 2.9%. As at 2019, the county had 173176 households. The population is projected to grow to a total 1,914,796 with 930,960 being males and 983,836 being females by 2022.

Gazi village had a population of 5221 distributed in 350 households. The study analysed the demographics of 58 households from Gazi village and found that 65.4% (n=34) were headed by males, and that the Digo 61.5% (n=32) was the main ethnic group. Further, it was found that most of the households (53.8%; n=28) were headed by single parents; while 33% (n=17) and 7.6 % (n-4) were headed by married and widowed respectively. Most households heads (32%; n=61) have attained post-secondary school levels of education, while 9% (n=17) and 11% (n=6) have attained upper and lower primary education respectively. The average family size was found to be 5.28 persons, while the highest had 10 and the lowest had 1 person(s) respectively.

The proposed oyster project will therefore directly impact on the livelihoods of many people.

3.5 Livelihoods

Agriculture is one of the main economic activities carried out in Kwale County with 85% of farmers practicing subsistence farming. The agricultural sector plays a crucial role in guaranteeing food security, poverty reduction and employment creation in the County. In spite of the importance of agriculture, food insecurity is still a challenge in the county. Most of the farmers in the county practice mixed farming.

Fishing is the second important source of livelihood in Kwale County. The County has abundant fisheries reserves along the coastline. Major fish reserves include: Shimoni, Vanga, Msambweni, Diani, and Tiwi.

There are 20 beach management units (BMUs) and 54 landing sites. The main types of fish include Rabbit Fish, scavengers, snappers, parrot fish, octopus, squids and variety of ornamental fish. In addition, there are 338 fish ponds in the county.

Findings from the household survey conducted in Gazi village also revealed that fishing is the second-most important source of livelihood at 19.2% (n=10), while small businesses 36.5% (n=19) was the main source of livelihood. The proposed project is therefore in harmony with the livelihoods of the community.

Figure 5: Fishing and fishing-related activities form important sources of livelihood in Gazi (Photo: Tunje, J.G)

Other livelihood sources include faming 15% (n=8) and formal employment 13.4% (n=7)

Tourism is another important source of livelihood and development in Kwale County. The tourism sector is key and critical for creation of employment, revenue generation, and creation of demand for goods and services and inclusive growth. Main tourism attraction sites in the county include the beaches, marine parks and reserves, wildlife and culture of the community.

In Gazi village, the mangrove board walk managed by women is an important tourism attraction.

Figure 6: Gazi Mangrove Board Walk

The main sources of income for people in Gazi village were reported to be fishing (10%; n=19.2), farming (10%; n=19.2), fish trading (9.6%; n=5) and small-scale businesses (9.6%; n=5)

3.6 Forestry

There is one rain forest that is Shimba Hills Forest. There are a number of indigenous forests commonly known as Kayas which are sacred sites and are maintained by the Mijikenda Councils of elders. The size of the gazetted forest is 350.45Km2 and 1900Km2 for non-gazetted forest. These forests provide major source of income, food and medicine to local communities, wood and timber for construction purposes as well as charcoal on which over 90 percent of rural households depend.

The mangrove forests found in sheltered bays are important ecologically and economically since they sustain beekeeping and provide shelter to some fish species and oysters.

Figure 7: Mangrove Forest in Gazi

3.7 Environmental degradation

The main contributor to environmental degradation in the County is solid waste such as plastic bags; bottles; cans; garden and kitchen waste; vegetable waste and oil waste, logging (charcoal burning), bush fire (burning vegetation by farmers), overgrazing, dumping of solid waste by the hotels next to the ocean. Mining and sand harvesting also contribute to environmental degradation by leaving behind sites that are not rehabilitated as well as leaving mines and materials that have radioactive emissions.

Deforestation also contributes to environmental degradation. For example, the County had, in 2010, 85.8kha of tree cover, extending over 10% of its land area, however, in 2021 653ha of tree cover was lost, equivalent to 396kt of CO_2 emissions. (www.globalforestwatch.org).

3.8 Awareness of the proposed Oyster project and its associated benefits

Most of the households surveyed were aware of the proposed oyster project in Gazi as reported by 52% (n=27) of the sampled households, while 42.3% (n=22) reported not being aware. Of those who were aware of the project, 26.9% (n=14) heard of it through friends and other people; 15% (n=8) leant of it through KEMFRI, while 9.5 (n=5) knew of the project in meetings.

The Consult held public meeting to create awareness and sensitize the community on the proposed project, attended by about 50 people. The attendees later informed other people in the village. To this end, the community is well informed about the project, however there is still need for more awareness creation meetings.

The sampled households were asked if they derive any benefits from the land (part of the sea) where the project will be established, 44.2% (n=23) answered to the affirmative while 42.3% (n=22) had contrary

opinion. Those who reported benefits use the proposed project site mainly as a fishing site (36.5% (n=19) or for both fishing and ecotourism (7.6%; n=4).
Most of the sampled respondents (88.5%; n=46) were in support of the establishment of the proposed oyster project, while 7.6% (n=4) were of the contrary opinion. This is because most of the sampled respondents (76.9%; n=40) associated the proposed project with numerous benefits, while only 6% (n=11.5) do not foresee any benefits. This therefore justifies the need for more education and awareness on the proposed project and its benefits to the community.

On the benefits associated with establishment and operation of the proposed oyster project, sampled respondents gave several ways through they will benefit, ranging from economic to conservation benefits.

Creation of job opportunities to the community was reported as the main benefits of the oyster project by 44.2% (n=23) of the sampled respondents; while the project being a source of income through fishing and ecotourism activities was reported by 23.1% (n=12) of the respondents. Some residents mentioned that here will be transfer of skills.

On whether the propose project will have negative impacts, most respondents (88.5; n=46) %reported that the project will have no adverse effects. However, few respondents (9.6%; n=5) reported issue of lack of transparency, corruption and discrimination when it comes to offering employment opportunities in the project; while 1.9% (n=1) reported that the project will lead to reduced fish production.

3.9 Ecological /Environmental aspects of the project

On presence of critical habitats at the proposed project site, 73% (n=38) reported the absence of critical habitats (sea grass, corals, etc) while 29.2% (n=10) reported affirmatively. Further, the survey found out that there are no archeological sites at the proposed oyster project sites.

The project was reported to have some environmental benefits, including increased biodiversity and fish production as reported by 38.4% (n=20) of the respondents; while erosion control, improving aesthetics and air regulation were also mentioned.

The only environmental negative impacts of the project mentioned was pollution reported by 10.5% (n=6) of the respondents. Pollution would come from debris and improperly disposal of the oyster shells.

In general, from the proceeding presentation, the proposed project is perceived to have more socio-economic and environmental benefits than negative impacts.

CHAPTER FOUR

4.0 ANALYSIS OF PROJECT ALTERNATIVES

4.1 The proposed alternatives

Cognizant to the delicate nature of marine ecosystems it is not possible to establish a project of this class without any consideration of alternatives. The alternatives should give incentives to save the environment from possible deleterious activities, be economically and socially safe. To be economically viable, the preselected sites must combine the following:

i) Abundant resources, available all year long and the possibility of sustainable production;
j) Existing water supply all year long in acceptable quantity and quality (turbidity, salinity, temperature and pH);
k) Existing transportation facilities for access to the farm and marketing of produce;
l) Existing energy supply;
m) Consistency of waves and tides cycle and sizes in the area;
n) Level of anticipated disturbance to the marine ecosystem and
o) Gradient and orientation of the coastline.

To arrive at the best site option, the following checklist was used: -

S/NO	QUESTION	YES	NO
1.	Is there good depth of water all year round?	YES	
2.	Are there sufficient raw materials in the area?	YES	
3.	Is it possible to cultivate oysters while sustainably managing the ecosystem?	YES	
4.	Are there resources sensitive to the proposed undertaking?	YES	
5.	Are there endangered species in the area?		NO
6.	Are there sensitive biotopes like rain forest, mangrove, coral reefs, sea grass, wetland?	YES	
7.	Is there adequate access to site?		NO
8.	If no, is there a negative impact associated with the transportation framework to be developed?		NO
9.	Is energy supply assured?		NO
10.	If no, will the energy supply used have negative impact?		NO
11.	Will the oyster farming operations negatively affect ocean?	YES	
12.	Are there PAP (Affected Project Affected Persons) groups?	YES	
13.	Will the project affect important man-made patrimony?		NO
14.	Does the project cause displacement of people?		NO
15.	If yes, are there sufficient lands for resettlement in the surrounding?	YES	
16.	Are there definite risks associated with the proposed project?	YES	
17.	Is there positive impact of the project in the area?	YES	

The proponent wishes to have maximum utilization of the project area while employing best operation practices to avoid environmental harm. While there will be augmentation of the access road to the site, no negative impacts have been foreseen. The operations are also not going to cause displacement to the PAPs but cause a beneficial impact to the fishermen and sea grass farmers. No important social or cultural site has been mapped in the project area. Whereas the site workers shall be drawn from various ethnicities in the country, national integration shall ensue from project implementation.

4.2 Raw Materials

The raw materials that shall be used to generate market size oysters include**;**

i. The spat
ii. Ocean water
iii. Desired nutrient content in water

The ocean water is available with good depth, tidal ranges, low wave energy and loaded with necessary nutrients to feed the oyster seeds that shall be reared therein. The spat shall be imported in desired quantities and systematically introduces into the water.

4.3 Alternatives to Technology

Oyster farming engages two main techniques, that is the bottom methods and off-bottom ones. Under normal circumstances, there is a lot of monitoring for necessary operations such as reproduction. At Gazi, the proponent shall import a triploid spat (spat is a stage of oysters where they are ready to attach themselves to a substrate) which shall not reproduce but mature in the farmer's desired arrangements. Floating cages and suspended long lines shall be the specific culture methods carefully chosen to avoid some predators and interference with the marine environment.

Since the culture shall not entail use of any other foreign chemicals or materials, very negligent distraction is expected in the environment. The oysters shall ease pressure on the dependence on terrestrial proteins such as beef which has a considerably high carbon footprint. For the time they shall be in the water, the oysters shall provide critical ecosystem services such as shoreline protection, maintenance of water quality and provision of habitats for other organisms including fish. Large scale cultivation of oysters and shellfish have been proposed as ways to sink carbon, mitigating climate change. This is because carbon dioxide from the atmosphere shall be used to make the shells in the form of calcium carbonate which is stable over geologic time. While these are one of the best practices available in the field, the proponent experts shall monitor any changes on the baseline information of the culture area to make corrective operations.

4.4 Treatment Alternatives

Treatment of oysters entails all the practices that will be done right from harvesting to sale of the produce. After cleaning and weighing, they shall be packaged in reusable trays and other materials where possible to avoid too much material use. Since there is no power supply to the project area, by the time of project conception, the proponent shall install solar panels which shall be used for office and cooling activities, to

augment a back-up generator that may be used in low solar times. All these processes are geared to make oyster production a clean entity as much as it is possible.

4.5 The "No Project" Alternative

Unlike other marine-served developed countries, Kenya is novice to aquaculture, especially mariculture. The country currently suffers acute economic challenges and food shortage. Most counties are already joining the alarm phase of drought calling for emergency back-up plans to help counter related losses. More resources are being allocated to climate change adaptation and mitigation both at national and devolved units of government. These challenges can disorient any country from any development opportunities at its disposal. To mitigate the challenges, there has been a call to invest in sustainable blue economy so as to reap from the potential therein. Since the current practice has been practiced in many countries, it has been largely proven to fight effectively against the climate change tragedy while providing food and other ecosystem services.

The "No Project" alternative applies when the negative impacts outweigh the opportunities that are can be earned from any proposed project. Critically looking at the current project, there is no substantive reasons to rule it out. Moreover, an impact-specific EMP has been provided to the proponent to ensure integrity on the critical marine environment. The EIA experts shall commit to ensure implementation of the EMP proposals throughout the project course.

4.6 The "Yes Project" Alternative

From the economic viewpoint, the project shall have more benefits for the Gazi area than losses. These include the generation of income both directly and indirectly. The project has also shown an intensive plan to protect the ocean ecosystems, bring solutions to the challenge of food security, improving human health among other benefits.

The use of a triploid spat that does not reproduce, utilize feeds, antibiotics or any other chemicals. These make it easy to protect the ecosystem from much interference on the food chain, poisoning and sediment pollution. The proponents' commitment of one shilling per kilogram of oyster share not only benefits the BMUs, but also ensures the local community lives in harmony and utmost support of the project activities for common benefit. Whereas the project is intended to have an effect on the sailing activities, the proponent has been, in this report, provided with an environmental management plan and occupational safety standards that shall guide the operations.

Offshore areas may be problematic if they are not close to a suitable land-based facility and long distances must be travelled each time stock is to be placed or maintenance carried out. Access to markets also needs to be considered, particularly when moving live stock to be processed. Normally, oyster farms are suitably located in sheltered bays where there is likely low disturbance of the culturing furniture from tides, waves and sediments. Again, the tides and currents should be just enough to warrant nutrient supply for the spat. The proposed area, Gazi and another location in the south, Funzi bay were in these regards chosen as the most suitable places in after consideration of the environmental, social and economic factors. The proponent therefore settled on Gazi for being the most competitive and near the market site.

CHAPTER FIVE

5.0 RELEVANT POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

5.1 Overview

Kenya has a legal, policy, and institutional framework governing fishing and fish-related activities. This chapter examines the governing framework under which the Gazi Oyster farming project by Swahili Coast Farms Limited will be implemented. This is to ensure that the proposed project attains its legal obligations, a requirement under the EMCA Act 1999 (the Environmental Management and Coordination Act, R*evised 2015*). Mariculture, which falls under commercial exploitation of flora and fauna, is listed in the Second Schedule of the EMCA as requiring Environmental Impact Assessment (EIA). The Proponent, their staff, project beneficiaries and other relevant parties are required to observe the provisions of the various legal, policy and institutional arrangements whose aim is to maintain a clean and healthy environment and sustainable project during the entire project lifecycle.

5.2 The Institutional Framework

5.2.1 The Kenya Fisheries Service (KeFS)

The Kenya Fisheries Service is a corporate body established under the Fisheries Management and Development Act No. 35 of 2016 whose main purpose is to conserve, manage and develop Kenya's fisheries and aquaculture resources that will ultimately realize an accelerated socio-economic growth in Kenya.

The Proponent will have to obtain all necessary documentation from the Service, including permit or no objection letter to undertake the project.

5.2.2 Kenya Wildlife Service (KWS)

The Kenya Wildlife Service (KWS) conserves and manages Kenya's wildlife for the Kenyan people and the world. It is a state corporation established by an Act of Parliament Cap 376 with the mandate to conserve and manage wildlife in Kenya, and to enforce related laws and regulations. Outside protected area, KWS undertakes conservation and management of wildlife resources in collaboration with other stakeholders.

In the proposed project, the Proponent will be required to collaborate, whenever possible, with KWS in carrying out marine resources conservation activities.

5.2.3 Kenya Marine and Fisheries Research Institute (KEMFRI)

Kenya Marine and Fisheries Research Institute (KMFRI) is a research institution established in 1979 by the Science and Technology Act, Cap 250 of the Laws of Kenya, which has since been repealed by the Science, Technology and Innovation Act No. 28 of 2013, with the mandate to undertake research in marine and freshwater fisheries, aquaculture, environmental and ecological studies with the purpose to generate and disseminate scientific information for sustainable development of the Blue Economy.

The Proponent will be willing to share any information and data arising from implementation of the proposed project.

5.2.4 Ministry of Health

The Ministry of Health has the responsibility of promoting health Kenya's though the provision of affordable and accessible medical services. Further, the Ministry is also charged with th responsibility of prompting good public health and hygiene. Heath services were devolved to the County level.

The proposed project will have a facility (unit) where the product (oyster) will be weighed, processed and finally packaged for export. The County Health Department will have to inspect this facility and ensure that it is up to the required standard, and then give its certification.

5.2.5 Ministry of Industry, Trade and Enterprise Development

One of the key mandates of this Ministry is to promote standardization in industry and quality control, and the promotion and development of micro and small enterprises. The Proponent will be expected to closely work with the Ministry in the proposed project in order to promote sustainable trade in fish and fish products.

5.2.6 Beach Management Units (BMUs)

Beach Management Units (BMUs) were established in mid-1990s bring together al resource user groups at a given beach within communities and state actors to share responsibilities in resource management and conservation as an important way to improve the livelihoods of people dependent on these resources. An important role that BMUs undertake is the general development of fisheries resources in their areas of jurisdiction.

The Proponent in the proposed Oyster project will be required to work closely with the Gazi BMU to promote the sustainable development of marine resources.

5.3 The Legal framework

5.3.1 Constitution of Kenya 2010

The Constitution of provides the broad framework regulating all development aspects of the people of Kenya. It is the supreme law of Kenya and binds all persons and all state organs at all levels of government.

Article 42 of chapter Four (The Bill Of Rights) confers to every person the right to a clean and healthy environment; this includes the right to have the environment protected for the benefit of present and future generations through legislative measures, particularly those contemplated in Article 69, and to have obligations relating to the environment fulfilled under Article 70.

Chapter 5 of the Constitution is on Land and Environment, and provides the central pillars on which environmental statutes are hinged. Part 2 of the chapter dwells on the environment and natural resources. It

provides a clear framework of the state's obligation with respect to the environment. Article 69 states the obligations in respect of the environment, i.e.:

The state shall:

a. Ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;
b. Work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya;
c. Protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;
d. Encourage public participation in the management, protection and conservation of the environment;
e. Protect genetic resources and biological diversity;
f. Establish systems of environmental impact assessment, environmental audit and monitoring of the environment;
g. Eliminate processes and activities that are likely to endanger the environment; and utilize the environment and natural resources for the benefit of the people of Kenya.

In compliance with the Constitution, every activity or development project within Kenya must adhere to the right of every individual to a clean and healthy environment and also be in conformity with the country's vision for the environment. The Gazi Oyster farming Project utilizes critical components of the physical/natural environment, thereby necessitating clearly spelt out environmental management plans to curb any resultant adverse environment effects.

5.3.2 EMCA (Environmental Management and Coordination Act) 1999

EMCA 1999 is an Act of Parliament that provides for the establishment of appropriate legal and institutional framework for the management of the environment and all matters related to the environment.

EMCA provides regulatory provisions for all levels of environmental conservation and management. Important sections of the Act regulate on enforcement of provisions outlined in the Act and recognition of international agreements along which the EMCA has been established. They are; Environmental Restoration orders, Environmental Easements, Inspection, analysis and records, International Treaties, Conventions and Agreements, National Environment Tribunal, Environmental Offences. The project proponent is required to comply with the Act accordingly, especially Environmental Impact Assessment [stated in section 58(2)] as: *"the proponent of a project shall undertake or cause to be undertaken at his own expense an Environmental Impact Assessment study and prepare a report"*. The authority (NEMA), after reviewing the study report, and being satisfied that the intended project will not have significant impact on the environment, gives approval for implementation.

A number of supplementary regulations to EMCA 1999 for managing the environment have been enacted and include the following:

5.3.3 Environmental Management and Co-ordination (Amendment) Act, 2015

This is an act of parliament enacted to amend the Environmental Management and Coordination Act, 1999. It directs that every person shall cooperate with state organs to protect and conserve the environment and to ensure the ecological sustainable development and use of natural resources. Any person who contravenes any measure prescribed by the Authority (NEMA), or fails to comply with a lawful conservation directive issued by the Authority or its Environment Committee at the counties commits an offence. Voluntary environmental and natural resource conservation practices to recognize, protect and enhance indigenous knowledge and associated practices are encouraged.

5.3.4 The Environmental (Impact Assessment and Audit) Regulations, 2003

This supplementary legislation to EMCA 1999 gives additional clout by providing guidelines for conducting Environmental Impact Assessments and Audits. It offers guidance and emphasis to be laid during field study and outlines the nature and structure of Environmental Impact Assessments and Audit reports. Additionally, the legislation explains the legal consequences of partial or non-compliance to the provisions of the Act.

Relevance – The proponent will be required to undertake annual environmental audit of the proposed Oyster project.

5.3.5 The Environmental Management and Coordination (Water Quality) Regulations, 2006

This piece of regulation applies to water for domestic use, water used for industrial purposes, agricultural purposes, recreational purposes fisheries and wildlife and any other purposes. It stipulates quality standards for sources and discharge of water to any environmental receptors within an activity area. The regulations outline various water quality standards in relation to use and discharge. Such aspects provided for are;

- Quality standards for sources of domestic water;
- Quality monitoring for sources of domestic water;
- Standards for effluent discharge into the environment;
- Monitoring guide for discharge into the environment;
- Standards for effluent discharge into public sewers; and
- Monitoring for discharge of treated effluent into the environment

Relevance - The proposed Gazi Oyster farming project will not abstract any quantities of water from the ocean. It will be however be fundamental to regularly analyze water quality and check for conformity to stipulated legal standards, e.g. in this supplementary legislation. The proposed project will not have significant discharge of effluents and other pollutants into the sea.

5.3.6 Environmental Management and Co-ordination (Waste Management) Regulations, 2006

These regulations offer legal provisions for handling of a variety of wastes emanating from various projects and activities. The waste categories covered by the regulations include:

i. Industrial waste
ii. Hazardous waste
iii. Biomedical waste
iv. Radio-active substances
v. Pesticides and toxic substances

The regulations outline requirements for handling, storing, transporting, and treatment/disposal of all waste categories as provided therein.

Relevance – The proposed Gazi Oyster farming project will not generate any of the above-mentioned waste types during its life span; however, the Proponent will be required to undertake regular monitoring of the water quality at the project site.

5.3.7 County Government Act, 2012

The County Governments Act of 2012 was enacted with purposes of giving effect to Chapter Eleven of the Constitution; *to provide for county governments' powers, functions and responsibilities to deliver services and for connected purposes*. Fisheries management is one of the functions that were devolved to the counties in the Second Schedule of the Constitution of Kenya 2010.

Relevance – The Proponent will collaborate with the county government in the implementation of the proposed project.

5.3.8 Laws on property and land rights in Kenya

The Kenya Constitution 2010 provides constitutional foundation for land ownership and protection of land rights in Chapter 4(Bill of Rights) and Chapter 5 (Land and Environment). According to Article 61 (1), all land in Kenya belongs to the people of Kenya collectively as a nation, as communities and as individuals. Land in Kenya is thus classified as public, community or private. Two of the categories are subsequently defined:

Public land- Includes all minerals and mineral oils; government forests, government game reserves, water catchment areas, national parks, government animal sanctuaries and specially protected areas, gazetted roads and thoroughfares, all rivers, lakes and other water bodies as defined by law; the territorial sea, continental shelf, exclusive economic zone and the sea bed, all land between the high and low water marks. Any land not classified as community or private land under the Constitution-such public land shall vest and be held in trust by the national government in trust for the people of Kenya and shall be administered by the National Land Commission.

Community land includes land that is —lawfully held, managed or used by specific communities as community forest, grazing areas or shrines, and —ancestral lands and lands traditionally occupied by hunter-gatherer communities. Rights are also held through traditional African systems, and rights that derive from the English system introduced and maintained through laws enacted by colonial and then the national parliament. The former is loosely known as customary tenure bound through traditional rules (customary law).

Relevance - During the study it was established that the land (part of the sea) under which the project falls is public land and is dedicated to fishing activities by the community. Additionally, the project beneficiaries (Gazi community) were in agreement that this land (part of the sea) shall be utilized for the development of the oyster farming project as supported by the area **Chief** and **BMU's letter** (see Appendix).

5.3.9 Fisheries Management and Development Act, 2016 (No. 35 of 2016)

This Act provides with respect to a wide range of matters concerning the fisheries sector including fisheries management and conservation, aquaculture and fish processing and marketing. It establishes the Kenya Fisheries Advisory Council ("Council"), The Kenya Fisheries Service ("Service"), The Fish Marketing Authority ("Authority"), the Fisheries Research and Development Fund and the Fish Levy Trust Fund. The objective of this Act is to protect, manage, use and develop the aquatic resources in a manner which is consistent with ecologically sustainable development, to uplift the living standards of the fishing communities and to introduce fishing to traditionally non-fishing communities and to enhance food security. Guiding principles of the Act include, among other things, conservation and protection of fisheries habitats, ensuring the effective application of the ecosystem approach to fisheries management and that biodiversity and genetic diversity in the marine environment is maintained and enhanced, encouraging the participation of users of the fisheries resources, and the general community, in the management of fisheries, application of the precautionary approach to the management and development of the fisheries at no less standard than is set out in any international agreement.

Relevance – The Proponent will ensure that the Gazi oyster farming project is implemented in a manner that will be ecologically sustainable and that it will contribute to improved living standards of the community around.

5.3.10 Fisheries Act, Cap. 378 (1991, Revised 2012)

This an Act of Parliament sets up the basic principles for the development, management, exploitation, utilization and conservation of fisheries and for connected purposes. The Act provides for two kinds of activities to be regulated by the Director. Section 4 stipulates that the Director shall, in cooperation with other government bodies, promote the development of fisheries, fish culture and related industries through such measures as listed in the Act. Part IV Section 8 affirms the necessity of the possession of a valid license in order to fish in Kenya fishery waters.

Relevance – The project will have to be licensed by the Director of Fisheries.

5.3.11 Fisheries (Beach Management Units) Regulations, 2007 (Cap. 378)

These Regulations make provision for the establishment and administration of Beach Management Units. Under this regulation, The Director of Fisheries facilitate the establishment of beach management units for each fish landing station, Apart from strengthening of management of fish-landing stations, one major objective of the BMU is to promote sustainable management of fishery resources and the aquatic environment, and support the sustainable development of the fisheries sector.

Relevance - The project Proponent will be required to closely work with the Gazi BMU in the construction and implementation and of the oyster project. The Proponent will also be required to get a "no-objection" letter from the BMU.

5.3.12 Wildlife Conservation and Management Act, 2013 (No. 47 of 2013)

This is an Act of Parliament to provide for the protection, conservation, sustainable use and management of wildlife in Kenya and for connected purposes. The Act applies to all wildlife resources on public, community and private land, and Kenya territorial waters. Part (V) of the Act details more on the conservation, protection and management of wildlife resources in Kenya.

Relevance – The proponent will have to ensure that the project promotes sustainability in its use of marine resources.

5.3.13 The Climate Change Act 2016

This Act of Parliament to provide for a regulatory framework for enhanced response to climate change; to provide for mechanism and measures to achieve low carbon climate development, and for connected purposes.
With the enactment of the Climate Change Act 2016, Kenya joins the league of nations that have taken concrete steps to domesticate the Paris Accord on Climate Change. The main object of the Climate Change Act is to be applied in the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya.

Relevance – The proponent should undertake a climate change risk and vulnerability assessment for the proposed Oyster farming project.

5.3.14 Kenya National Biodiversity Strategy and Action Plan (2019 – 2030)

Kenya's biodiversity is important to the national socio-economic and cultural sustainability; and it is important to maintain a proper balance between all life forms and ecosystem so as to promote national growth and development in all sectors.

Kenya is a signatory to the Nagoya Convention and the Convention on Biological Diversity (CBD). The strategy is a road map to achieving biodiversity conservation targets in the country while also fulfilling international and regional obligations.

Relevance – The Proponent will ensure the conservation of marine biodiversity.

5.4 International Conventions and Treaties Biodiversity Conservation

5.4.1 Convention on Biological Diversity

The objectives of this Convention are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies.

Relevance – The Proponent will strive to achieve the provisions of this Convention through sustainable use of the resources and the transfer of oyster farming technologies/skills to the local people. The local community will also get a share of the benefits from the project as outline in other sections of this report.

5.4.2 The Nagoya Protocol

This is an international agreement that governs the conditions for the export of genetic resources. It requires that communities give prior informed consent on the use of genetic resources within their area of jurisdiction, and an agreement between whoever is taking them, the government and the community on sharing of benefits.

Relevance – The Proponent will seek consent from the BMU to use the marine resources within its area of jurisdiction, and sign an agreement that explicitly explains how the community will benefits from the project.

CHAPTER SIX

6.0 PUBLIC PARTICIPATION AND CONSULTATION

6.1 Methodology

The preparation of an Environmental and Social Impact Assessment (ESIA) project report is a multidisciplinary process that requires use of various approaches and data collection methods. In this report, data was collected using Household Surveys (HS) where questionnaires were administered to household heads in Gazi village; Key Informant (KI) interviews where government officials were interviewed; public meeting, and field observation. Desk top and literature search from different sources was used to collect secondary information.

6.1.1 Questionnaires

These were administered randomly to household heads in the village that were also form part of the target community with aim of seeking their views and opinion on the proposed project. Other stakeholders interviewed include the local administration (Area Chief). A total of 52 respondents (households) participated in the survey. Samples of completed questionnaires are attached in appendix.

6.1.2 Filed Observation

Field observations formed an integral part of the study as the Team gathered considerable information through observations. This involved site visits and recording the situation on the ground. Observations were also used as a tool for verifying the facts that were gathered through interviews and questionnaires. Photographing was used to augment observation.

6.1.3 Desk top search

This was used to collect secondary information from past similar projects. Different sources were used including past approved similar project reports, project proposal documents, government documents, and the internet. These gave very important information on the baseline information of the project area, relevant policy and legislative frameworks, and likely impacts of the project.

6.1.4 Public meetings

In conformity to the environmental legislation, one public meeting (baraza) was held at the project site where fishers and other community members, who are the main Project Affected Persons (PAPs) were consulted and their views, opinions and concerns collected and documented. Such meeting also gave an opportunity for the Team and project Proponent to know the community mood and attitude towards the proposed project. Apart from the use of a predetermined checklist to collect views from the farmers, minutes were generated from these meeting that also captured the deliberations (see Appendix).

6.1.5 Reporting and documentation

An Environmental and Social Impact Assessment (ESIA) project report was compiled in accordance with the guidelines issued by NEMA for such proposed projects, and shared with the Project Proponent who later submitted the same to NEMA for review and approval of the project.

6.2 Consultation and public participation

A key requirement of any ESIA process is to conduct comprehensive public, stakeholder, and aboriginal engagement. The goals of such engagement are to inform such parties about the project, to assist in the identification of key issues and concerns in respect of the project, to obtain information that may assist in carrying out baseline or predictive studies for the ESIA, to collect information in respect of the current use of land and resources for traditional purposes by aboriginal persons, and to ensure that sufficient information in respect of the Project is available to neighbours, stakeholders, and the general public. There are additional objectives around the development of support for the project in the community and with governments.

The Environmental Management and Co-ordination Act, 1999 (Amendment, 2019) require that **Swahili Coast Farms Limited**:

"…must consult with persons and organizations potentially affected by the comprehensive study report and associated infrastructure, and must inform and engage any interested individuals, groups, stakeholders, local fishermen, recreational users, affected communities, and aboriginal communities in this assessment. This will include local governments and specific groups with mandates/initiatives in this area. The stakeholder consultation program is to be reviewed and accepted in the early stages of the study (e.g., at the TOR stage)."

Section 17 of the Environmental (Impact Assessment and Audit) Regulations (2003) requires that all Environmental and Social Impact Assessments should undertake Public Consultation as part of the assessment process. The main goal of public participation is to ensure that all stakeholders interested in a proposed project (including project beneficiaries and the general public in the vicinity of the proposed project) are identified and their opinion considered during project design, construction, operation and decommissioning.

As part of the ESIA process for the Gazi Oyster farming Project, a total of 48 community members (Males = 26; Females = 22) were engaged in a public meeting held on 7th October, 2022 at the Gazi BMU Hall to inform both the study and the project. These people, who represented the wider Gazi community, were consulted because they form part of those who will be affected directly by the project, apart from being opinion leaders in the community, and. they included fishers, fish traders and seaweed farmers who are the major project beneficiaries.

Community and stakeholder consultations and engagement was done so as to achieve the following objectives:

i. Disseminate and inform the community about the proposed oyster farming project, with special reference to its key components and expected impacts
ii. Create awareness among the public on the need for the ESIA and its due process
iii. Gather comments, concerns and suggestions regarding the project from the community and other stakeholders, including the identification of issues of concern
iv. Ensure that the concerns of the community are known to decision-making bodies and the proponent at an early phase of project life
v. Establish a communication channel between the general public and the ESIA Team, and the Proponent (Swahili Coast Farms Limited) and the Government (both County and National)
vi. Incorporate community and stakeholder's concerns appropriately into the ESIA report, particularly the potential positive and negative social impacts, and subsequently the mitigation measures identified.

6.2.1 Issues that rose during public consultation meeting

All people consulted were positive about the proposed project and reported that it will have advantages both to the individual fishers and the targeted community at large. However, they were skeptical because there was once such a project implemented by KEMFRI that failed and the community didn't realize the envisaged benefits. The community was assured that with their support, the proposed project will be successful because the Proponent is a private developer and therefore the project won't face the red-tape bureaucratic procedures associated with government project.

The following are some of the mentioned anticipated positive (advantages/benefits) and negative (disadvantages/demerits) of the proposed Gazi oyster project:

6.2.3 Anticipated benefits of the proposed project:

i. Source of income to Gazi BMU through leasing of offices
ii. Gazi BMU will earn Sh. 1 for every kilo of oyster harvested and sold.
iii. Source of employment to youths and women since the project will employ 10 permanent and 15 casuals drawn from the community
iv. Oyster grow-out bags will act as FADs; increasing fish population in the around the project site
v. It is assumed that funds to BMU will be channelled to community projects for all to benefit
vi. The projects plans to construct a culvert to ease access to the site
vii. The project will set up cold storage facility for fishermen to store fish and reduce post-harvest losses
viii. The project plans to develop a scholarship program to support bright, needy and promising students from the community
ix. The project shall provide seaweed farmers with long lines during hot seasons for growing purposes

x. Since the project will not use any chemicals in the form of fertilizers, antibiotics or fish feeds, then there won't be any toxic substances added to the sea.

The following were some issues raised during the Question-and-Answer session of the meeting, and how they were responded to:

6.2.4 Summary of Issues Raised by the Public and their Reponses

Issue: Need of the fishermen to know how the project might cause hindrance on the normal fishing and sailing activities.

Response: The project area shall be demarcated clearly to avoid any hindrances to fishing and sailing at sea. However, the area shall serve as a fish aggregation centre where controlled fishing activities shall take place under supervision of the project management to avoid tampering with the project structures.

Issue: There is likelihood of the project implementation team using chemicals that are going to kill or make fish to migrate from the fishing areas.

Response: No artificial substances shall be added. The oyster cultures shall employ purely filter feeding method. Moreover, the triploid spat shall come with an accompaniment of health certificates and clear definitions of their original environmental conditions.

Issue: It is expected that the project will be tampered with by ill-intentioned people at sea at night. How shall the management protect the project against such vandalism cases?

Response: There shall be a security team in place. Also, the project shall have buoys lit around the boundary to reduce invasions. Some members of the community are also willing to counter any trespass cases they will find.

Issue: Some previous projects implemented in the region have come with benefits to the immediate communities. What does Swahili Coast Farms do regarding that?

Response: The proponent has a community benefits scheme which includes a scholarship program to well performing students in the community, training to members of the BMUs, construction of a culvert bridge for ease of access to the BMU landing site, renting the unused BMU offices, provision of cooling services to the BMUs and the BMU kitty boost of Ksh.1 for each kilogram of oyster sold.

Issue: There is possibility of breach of the promises made by the proponent during implementation of the progress. How can the stakeholders hold the proponent responsible?

Response: There shall be an agreement signed between the Proponent and the BMUs that will protect the community. The BMU will be requested to write a "LETTER OF NO OBJECTION"

Issue: Programs coming to the community experience mass labour importation, failing to secure opportunities to local people especially the youth.

Response: There shall be no outsourcing of employees from outside Gazi unless there is lack of personnel with the required technical expertise. Most of the workers such as divers, security, sorting and grading shall be done by the local people. Women shall be resourceful in the sorting and grading stages.

Issue: How long shall the project stay in the area?

Response: As long as there shall be no any notable negative environmental and socio-economic impacts.

At the end of these consultations, it was noticeable that the community was in support of the proposed Oyster project, and promised to share this information with other members of the community.

Figure 8: A section of the public meeting

Figure 9: The EIA Consultant (i) and Fisheries Officer (ii) explaining some points during the public meeting

CHAPTER SEVEN

7.0 IDENTIFICATION OF POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS & MITIGATION MEASURES

The proposed oyster farming project will potentially have both direct and indirect positive and negative impacts. This Chapter presents some of the major anticipated project impacts, and mitigation measures to reduce the negative impacts and enhance the project benefits.

7.1 Anticipated Positive Social-economic Impacts

The following are some of the anticipated direct social and economic positive impacts (benefits) of the project:

7.1.1 Creation of employment opportunities

The proposed project will provide direct employment to 25 youths and women (10 will be employed on permanent basis and 15 on casual basis). Considering that these employees will come from different households, the project will directly contribute to the enhancement of 25 households from Gazi community.

7.1.2Source of income to BMU

The project proponent intends to rent office space and oyster processing area from the Gazi BMU facility. The proponent will therefore be required to pay the agreed monthly rent which will be a source of revenue to the BMU.

Again, the project will be a direct source of revenue to the BMU since, since every one shilling for every one kilo of oyster harvested and sold will be donated to the BMU.

7.1.3 Improved incomes from fishing

The project infrastructure, including the oyster grow-out bags will act as fish aggregation devices that will ultimately lead to increased fish population. Further, no fishing will be dome in the project site, thereby giving time for the fish to naturally replenish. With time fish abundance will increase and there will be a spill-over effect to the areas bordering the project site where fishing will be dome. Fishers are therefore expected to realize increase in fish catch that will be translated to improved income from fishing.

7.1.4 Source of revenue to the national and county governments

The project Proponent will have to comply with all national and county government regulations, including payment of requisite taxes and levies. Further, the project will aim at exporting the oyster product. Through this, therefore, the projects will a source of revenue to both the county and national governments.

7.1.5 Promotion of ecotourism

The project infrastructure will complement the already existing tourist attraction sites in the area, namely the mangrove board walk, canoe riding, and the sea weed farming project. The project will therefore help in the promotion of ecotourism activities in the area that will improve community livelihoods.

7.1.6 Provision of education and research site

The project will be useful in education and research. The project can be used by both secondary school and university students as an education and research center for learning and conducting studies on marine biodiversity.

7.1.7 Growth and development of Gazi village

The implementation and operation of the proposed oyster project will lead to an influx of people in Gazi village, leading to increase demand for services such as housing and other amenities. This will lead to the growth of village. The project will also enhance publicity of the village and put it on the international limelight.

7.1.8 Capacity building and knowledge transfer

The fishers and other community members involved in the project will be directly capacity built to enhance their knowledge base on oyster faming. The local community members who will associate closely with the project or the trained fishers are likely to benefit from knowledge transfer, and may use this knowledge in future to their advantage.

7.1.9 Improved food security and nutritional status

With increased awareness creation on oysters as food, and vigorous marketing of the product, we expect change of local peoples' attitude towards consumption of this product. The project will therefore contribute to achievement of food security both at individual household level and at the national level.

7.2 Anticipated Positive Environmental Impacts

The proposed oyster project is expected to have some positive environmental/ecological impacts, as stated below:

7.2.1 Improving ocean water quality

The proposed project will focus on oyster farming. Naturally, Oysters (and other marine organisms such as clams, and other shellfish) help remove excess nitrogen from waters by incorporating it into their shells and tissue as they grow. Further, Science has shown that oysters can play a role in restoring water quality because of their filter-feeding capabilities. Through filter-feeding, oysters remove nutrients from the water by consuming and assimilating the nitrogen and phosphorus from what they eat (algae, for the most part) into their tissue and shells;, and hence improving water quality.

7.2.2 The project as a carbon sinks

The organism to be farmed in this project, oyster, has a hard outer shell made of calcium carbonate. In In the process of shell formation, the organism absorbs carbon dioxide from the atmosphere, thus helping in the reduction of carbon dioxide levels in the atmosphere and helping abate climate change and global warming. The project site will therefore become a carbon sink.

7.2.3 Protect shoreline from wave erosion.

The project infrastructure in the water, including the oyster grow-out bags, will act as artificial reefs thereby dissipating energy from strong waves, and thus protecting the shoreline from wave erosion.

7.2.4 Provision of shelter and habitats to other marine organisms

Oysters are critical to marine ecosystems. The project infrastructure including the grow-out bags will provide shelter and habitat to many other marine organisms, including fish, invertebrates, and other shellfish to feed, shelter, spawn and aggregate. Oysters can therefore be considered as keystone species – a species on which other species in an ecosystem largely depend, such that if it were removed the ecosystem would change drastically. The project will therefore enhance the marine species diversity of the project site.

7.3 Potential Negative cumulative impacts

The assessment found **No** serious negative cumulative impacts from the proposed project. All the potential negative impacts identified are reversible and will be militated against to minimize their impacts and enhance project's benefits.

The following are the identified negative impacts of the proposed oyster project and their mitigation measures:

7.3.1 Source of marine pollution

During construction of the project infrastructure, the project is anticipated to generate debris that will be deposited in the sea and which will form source of pollution. This will potentially interfere will the normal functioning of the ecosystem.

Mitigation measures

- The debris can be reused in construction of other structures such as the culvert
- All debris generated should be carefully carried offshore

7.3.2 Possibility of introduction of invasive species

The project will use spat (oyster seeds) imported from Europe, and thus the possibility of introducing invasive species. However, it should be noted that the oyster species (*Crassostrea gigas)* to be farmed is endemic in the area, and belongs to the lowest trophic level, thus will not pose any competition to other organism in the ecosystem.

Mitigation measures

- The Proponent should ensure the use of certified spat/seeds
- The Proponent will ensure inspection of the spat before and after shipping from Europe to ensure that it is *Crassostrea gigas*

7.3.3 Interference with normal navigation routes

The site where the project infrastructure including the grow-out bags will be located is part of the sea which is normally used as navigation route. The project will therefore interfere with normal movement of sea vessels as fishing boats.

Mitigation measures

- Proponent to provide alternative navigation routes

7.3.4 Possibility of boat accidents

The project site, with its installed infrastructure is likely to cause accidents involving boats, especially at night and during high tide water levels.

Mitigation measures

- The project to use floating buoys to demarcate the project site
- The buoys should be able to illuminate light as warming to fishing boats and sailors at night
- All project boats to be fitted with life guards (such as jackets) and well-equipped First Aid kits

7.3.5 Contributes to poor aesthetics of the site

The project infrastructure including the oyster grow-out bags will be exposed during low water tide times, creating poor aesthetics of the site.

Mitigation measures

- Proponent to use experts during construction phase and ensure that all infrastructure is arranged in a way that they look smart and attractive to human eye

7.3.6 Influx of people to the area causing cultural pollution

During construction and operational phases of the project, Gazi village will witness and increase in human population from different walks of life in search of opportunities. The influx of people from different cultural and religious backgrounds may cause cultural shock /conflict.

Mitigation measures

- Trainings on community integration and how to manage cultural shock

7.3.7 Spread of communicable diseases

The project is likely to introduce and /or spread some communicable diseases in the area such as HIV/AIDS and sexually transmitted diseases.

Mitigation measures

- The Proponent to provide education and awareness on communicable diseases to the project staff and the community
- Provide condom dispensers at strategic location
- Proponent to provide free medical clinics to treat such diseases and others.

7.3.8 Possibility of strong waves destroying project infrastructure

This is a possibility, especially with the fluctuations in wave energy. Strong waves can potentially destroy the installed project infrastructure, thereby causing economic loss to the Proponent and pollution from the debris.

Mitigation measures

- Proponent to use best personnel with the requisite expertise who will establish good practices
- The project to use material and technology s that can withstand wave and tide energy
- Continuous monitoring of wave energy and use of more suitable structures

7.3.9 Change of use of the project site

Traditionally, the project site has been use as a communal fishing site by the Gazi fisher community. The site will now change use to oyster farming, causing displacement of the fisher and loss of livelihoods. The site was also used as a route when crossing to Chale Isalnd from Gazi village.

Mitigation measures

- The Proponent will allow fishers to access unutilized land of the project area.
- Allow fishing in other places within the project site, and monitor the same
- An alternative route shall be established by the proponent to Chale Island

- The area adjacent to the project site will be have abundance in fish population due to spill-over effect, and thus fishers will be allowed to catch fish here

7.3.10 Possibility theft and vandalism of the project infrastructure

Within the community, it is possible that there will be some few people who will be against the project for one reason or another, and they may work against the project, including theft of the oyster and vandalism of the project infrastructure.

Mitigation measures

- The Project Proponent to create good rapport with the community
- The Proponent to share the benefits of the project with the community
- The project to have CSR initiatives
- Employ the community as security at night

7.3.11 Work place-related sicknesses

The project work environment, both on-shore (during installing of the project infrastructure, planting of the spat, monitoring, and harvesting of the product) and off-shore (during processing and packaging of the product) may be a source of ailments including influenza, norovirus, hepatitis A, just to name a few.

Mitigation measures

- Observation of workplace ergonomics such as use of suitable tables and tools that make work easier
- Provide sanitary facilities and trash cans in boats and offshore
- Regular cleaning and disinfection of work place sanitary facilities
- Provide clean and antibacterial soap for hand washing at strategic points
- Anyone with disease symptoms to be hospital immediately

7.3.12 Work place injuries

Just like in any work place, the employees in this project can also get injured due to work place accidents.

Mitigation measures

- Provision of PPEs (masks, apron, goggles) while at work
- Use of right tool for the right purpose
- Provide swimming lessons to all project staff
- Provision of first auf kit and service providers

- Have a stand by Ambulance services
- Ensure good house-keeping in the area

7.3.13 Increased energy demand

The project will use electricity in the processing and packaging of the oyster product, thereby increasing carbon footprint of Gazi.

Mitigation measures

- The project will use of solar energy backed by standby generator
- All project activities to use environmentally friendly energy sources

7.3.14 Entanglement of fish and other marine creatures

It is possible that fish and other marine creatures will be entangled / trapped within the oyster infrastructure

Mitigation measures

- All the oyster grow-out bags will be suspended in water to allow fish and other marine organisms pass easily underneath them

CHAPTER EIGHT

8.0 OCCUPATIONAL HEALTH AND SAFETY

8.1 Introduction

It is commonplace that developing and established workplaces are prone to accidents that have historically temporarily injured, incapacitated occupants with permanent injuries or even led to losses of lives and properties. Due to the need to protect workers, the Work Injury Benefit Act (WIBA) and the Occupational Safety and Health Act (OSHA) were enacted in 2007. OSHA was established because shortfalls remained with reports that more than half of the work-related accidents and injuries went unreported or unattended. The OSHA and WIBA were created to be applied both in private and public workplaces. OSHA's core objective is to assure protection, wellbeing and welfare of workers and all individuals legitimately present at workplaces, to provide for the institution of the National Council for Occupational Safety and Health and associated functions. The WIBA provides compensation to employees for work-related injuries and diseases contracted in the course of employment. Alongside WIBA and OSHA, the Environmental Management and Coordination Act, The Pest Control Products, Radiation Protection Act, and Public Health Act are among the legislations that impacting on occupational safety and health.

Since the proposed project shall be executed in a marine area with potential danger of drowning and other clinical accidents, the proponent shall be alert to enforce the occupational health and safety measures suggested herein. Navigational accidents, injuries and effects of water pollution can be mitigated through installation of navigational aids, marker buoys, providing workers with adequate PPE and enforce on their use as well as controlling access to the farm section. These measures shall, by extension ensure environmental sustainability through development of sound conservation measures.

8.2 Implementation of the EHS Management Plan

The contractor shall use the EHS plan at the proposed project site during construction phase of the project with the assistance of an EHS consultant who shall enforce its provision throughout the project duration.

8.2.1 General Construction Safety

8.2.1.1 Training

- Employees operating construction equipment should be thoroughly familiar with the operational hazards involved; and

- Prior to commencing any activity at the site, all employees must review the Site-Specific Health and Safety Plan (HASP) and the hazards surrounding the equipment operation. This should be documented by having the employees read and agree with the provisions of the Site-Specific Health and Safety Plan and then by having them sign an acknowledgement form.

8.2.1.2 Housekeeping on and around the construction area

A clean work environment adds to construction speed and efficiency. Being a marine area with regular disturbances from the waves and tidal changes, all movable equipment should be operated offshore as where possible, taking readily assembled materials to the water for installation. For a safe and orderly work site, housekeeping shall the observed as follows;

- Construction machinery and similar tools should be orderly stored to prevent sliding, rolling, spreading, or falling;
- Suitable storage locations should be provided for all tools, materials, and supplies so that tools, materials, and supplies can be conveniently and safely handled without hitting or falling on any worker or visitor;
- Work areas, platforms, walkways, and other access ways should be kept free of materials, debris, and general obstructions;
- Oysters (the produce) and their shells should be handled by people in gloves and injury-proof boots and stored in spill-free containments.

8.2.1.3 General Inspection Routine

- Inspect construction equipment prior to use - correct any identified problem before proceeding with work;
- Ensure there are fully equipped first aid equipment and personnel to respond to any eventualities.
- Wear proper PPE: Hardhat, overalls and life jackets as a minimum; and
- Conduct tailgate safety meetings and facilitate a safe work culture.

8.2.1.4 Construction

- All personnel should know location and use of emergency communication systems.
- Identify potential pinch points and hazards which could injure fingers and toes;
- Never work under the influence of alcohol or drugs, whether legal or illegal.
- No visitors are permitted within the vicinity of the work area without proper protective clothing and authorized permission; and
- Do not exceed the manufacturers' technical specifications for items such as speed, force and pressure.

8.2.2 Near misses, Incidents and Injuries

To reduce impact of incidents and injuries and determine the performance of the EHS measures, timely reporting is key. No matter how minor, all near misses, incidents, and injuries shall be reported to a supervisor immediately.

8.2.2.1 Operating the Construction Equipment

Only employees with the necessary skills to operate construction equipment should be allowed to operate them. Other personnel wanting to use or move the equipment should do so only under supervision.

8.2.2.2 General Equipment Safety

With a vast number of tools that are likely to be used during construction and installation activities, the best rule of thumb is to use a tool only in the manner for which it was intended. Keep cutting tools sharp. If an accident occurs, treat all cuts and scratches immediately with simple first aid measures to prevent infection. Other guidelines include the following:

- Inspect tools and equipment prior to use;
- Use tools for their intended use only;
- Do not use damaged tools;
- Tools and equipment susceptible to rusting be kept away from the saline water.
- Never use excessive force on a tool. If excessive force is required, the wrong tool is being used.

8.2.2.3 Training and Documentation

The contractor and Swahili Coast Farms shall ensure that workers, prior to commencement of new assignments have received adequate training and information enabling them to understand the hazards of work and to protect their health from hazardous ambient factors that may be present. The training must cover the following area:

- Knowledge of materials, equipment and tools;
- Known hazards in the operations and how they are controlled;
- Potential risks to health;
- Precautions to prevent exposure;
- Hygiene requirements;
- Wearing and use of protective equipment and clothing; and
- Appropriate response to operation extremes, incidents and accidents

CHAPTER NINE

9.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (EMMP)

9.1 Introduction

The objective of this Environmental Management and Monitoring Plan (EMMP) is to formulate measures that will:

i. Mitigate adverse impacts on various environmental components, which have been identified during the environmental and social impact assessment and contained in this report
ii. Protect environmental resources where possible
iii. Enhance the value of environmental components where possible.

The Environmental monitoring component of the EMMP also includes a monitoring plan to enable evaluation of the effectiveness of the proposed environmental management measures, and to carry out reorientation of the plan if found necessary.

9.2 EMMP during construction phase

Potential Impact	Proposed Mitigation Measures	Monitoring Indicators	Frequency of Monitoring	Responsibility	Estimated cost (Ksh)
Sediment pollution	Develop and implement a water quality monitoring plan Establishment of support poles will be done during high tide to ensure dispersal of finer sediments, reducing turbidity Ensure collection of sediments for offshore disposal	Maintained ocean turbidity level Minimised sedimentation on sea grass beds and coral reefs.	Periodically	Proponent Sea grass farmers Contractor	20000
Impact on seaweed farming	Use silt curtains to localize turbidity to the construction area; Form a committee in collaboration with the seaweed farmers and SCF for timely interventions to protect the seaweed farms from pollution; Support Mwani women group to re-establish affected seaweed farms in suitable locations; Water quality monitoring.	Minimal interference with the seaweed farms; A working monitoring and evaluation committee; Continued normal seaweed farming business. Maintained water quality levels.	Throughout project life.	Proponent Seaweed farmers BMU	10000
Migration of fish	The location of the proposed sea farm is adjacent to and parallel to the shore minimizes interaction with the commercial fishing areas. Alerting fishermen during project	Avoided critical habitats.	Periodically	Proponent Contractor	20000

	construction stage.				
Injuries from Accidents	Basic first aid training of workers before construction begins to control accidents; Adherence to safety procedures Use of personal protective gear Provision of first aid kits on site; Employ competent personnel who can swim in the event of falls into the sea; Install safety signage boards at the project location; Recruit qualified occupational health and safety expert; Obtain insurance cover for employees and ensure appropriate compensation in the event of accident; Comply with OSHA, 2007;	Number of sensitization meetings held. List of first aid attendants Number of accidents cases reported Number of first aid kits purchased Number of safety posters produced and displayed. Workers dressed in PPEs.	Periodic checks	Proponent Project staff Contractor	10000
Alteration of normal sailing routes	Provision of alternative routes. Alerts on ocean users on change of route.	Sailors abiding by the new routes. Reduced incidences of interference with project activities.	Periodically	Proponent Contractor	10000
Influx labour	Training the community during chief barazas on how to manage culture shocks. Prepare a site-specific Labor Influx Management Plan;	Engagements of proponent representatives during barazas. List of meeting	Periodically	Proponent Project staff	10000

	Establish a liaison committee Establish a Swahili Coast Farms Grievance Redress mechanism.	attendants.			
Possible negative impact on ecotourism	Expert installation of project structures in a skilful and orderly manner. The design of the port should blend with its surroundings so that it helps to improve the scenery.	Increased visitation to see project structures.	During construction	Proponent Constructor	20000

9.3 EMP during operational phase

Potential Impact	Proposed Mitigation Measures	Monitoring Indicators	Frequency of Monitoring	Responsibility	Estimated cost (Ksh)
Change of ocean area use.	Allow fishing on the leased but unutilised project area Periodically monitored fishing in the project area Alternative route shall be established by the Proponent to Chale Island	Spotted fishermen on the denoted areas. Respect and friendship (good PR) among the project personnel and the local fishermen. Increased catch.	Periodic checks	Project Proponent Constructor	10000
Biodiversity and habitat loss	Ensure minimum disturbance on the water column and the sea bed. Carry out inventory on endangered and critical species in the area.	Biodiversity levels	Periodically	Project Proponent Constructor	10000
Pollution from oyster processing activities.	Keep the processing surfaces as clean as possible. Put in place drainage systems to remove any spillages therefore averting odours. Store the shellfish in cold and for short period of time. Seal by-products in covered, leak-proof containers; Comply with the provisions of the Marpol Convention 73/78.	Reduced odour strength and duration. Clean processing vessels and surfaces. Reduced length of storage time.	Throughout the project life.	Proponent Constructor Project staff	20000
Climate change adaptation	The engineering works to consider possible impacts of climate change such as sea level drop or rise; Comply with the Climate change Act,	Reduced interference of climate change on farm productivity. Increased tree	Throughout project lifetime.	Proponent. Contractor.	

	2016 and the National Climate Change Action Plan 2018-2022; Develop a SCF climate action plan. Support climate action programs going on in the community.	planting initiatives. Use of renewable energy by the farm. Water-tight climate action plan.			
Possible introduction of invasive species.	Ensure the oyster seeds come with necessary certifications. Monitoring changes in the culture area.	Recorded change of habitats. Certified seeds.	Periodically	Project Proponent Contractor Project staff KEMFRI	50000
Possibility of water vessel accidents.	Use floating buoys to demarcate the project site Use of illuminating buoys as warming to fishing boats and sailors at night. Clearly directing users on the new alternative routes.	No. of fishermen sensitized. Number of buoys installed. No. of accidents	Periodically	Project Proponent Project staff KMA	20000
Spread of communicable diseases such as HIV/AIDS.	Provision of education and awareness on communicable diseases to the project staff and the community. Providing condom dispensers at strategic locations. Proponent to provide free medical clinics to treat such diseases and others.	Reduced levels of infection within project area. Increased uptake of preventive measures. Reduced sick leave requests from staff.	Periodically Anytime when necessary	Project Proponent Project staff	10000
Wave and tidal destruction of project infrastructure.	Contractor to observe standards and best practices on installation works. Continuous monitoring of variations in wave and tidal levels for necessary precautionary measures. Carry out regular inspection of farm	Number of repairs done per unit time. A wave and tidal cycle inventory.	Periodically Anytime when necessary	Project Proponent Contractor	50000

	infrastructure to ensure its integrity.				
Possible vandalism and theft of project infrastructure	Proponent to secure good rapport with the immediate community. Employing local stakeholders as security personnel and other casual project staff.	Number of local people working as project staff. Incident records. Number of community support initiatives.	Periodically Anytime when necessary	Project Proponent Project Staff	20000
Upsurge of workplace related infections such as norovirus, influenza and hepatitis A.	Observation of workplace ergonomics such as use tools and equipment that make work easier. Provide sanitary facilities and trash cans in boats and offshore. Regular cleaning and disinfection of work place sanitary facilities. Provide clean and antibacterial soap for hand washing at strategic points. Cases of disease symptoms should be reported immediately and handled with care. Awareness and sensitization through placing of notices with relevant message at strategic points	Number of sanitary facilities in place. Number of trainings done on awareness creation. Availability and operability of workplace tools and equipment. Reduced infections during work or among staff. No. and types of notices places	Periodically Anytime when necessary	Project Proponent Contractor Project staff	20000
Increased energy demand and carbon footprints.	Use of renewable power from installations of solar panels. Sparing power use.	Reduced power bills. Size of solar panels installed.	Periodically	Project Proponent Project Contractor Project staff	10000

				KPLC	
Wastewater generation and management	Design and construct a bio-digester to manage effluent; Apply and obtain an Effluent Discharge License from NEMA; Comply with the Marpol Convention 73/78, The EMCA Cap 387 of the Laws of Kenya and The KMA Act, 2012; Comply with the Water Quality Regulations, 2006.	Presence of wastewater treatment and disposal facility. Reduced odors in the area.	Throughout project life.	Contractor Proponent Project staff	20000
Entanglement of fish and other marine creatures by the farm infrastructure.	Proper spacing of inter-lines to allow safe passes for fish and other marine creatures. Recording cases and conditions of entangled species for corrective responses.	Number of cases of entangled marine organisms.	Periodically	Project Proponent Contractor Project staff	10000
Influx of population in the area	Local administration to monitor incoming population Development of infrastructure to support the population increase. Training the community on cultural integration.	Number of people moving in and out of the project area. Number and types of new infrastructure. Number of meetings done on cultural integration.	Periodically	Project Proponent Local Administration	5000

Occupational safety and health	Install navigational aids, marker buoys, and early warning signage along the Gazi-Chale route. Sensitize local fishermen and tour operators on the farm area. Develop and implement a safety action plan and set goals to ensure zero fatalities; Provide adequate PPE to workers and enforce on their use; Control access to the farm; Ensure regular and proper maintenance of equipment and work tools; Conduct first aid training and provide well-stocked first aid kits at different sections of the farm; Record all accidents and incidents. Ensure medical insurance cover for farm employees; Carry out occupational health and safety undertakings and comply with the OSHA, 2007.	Reduced incidences and accidents. Well trained safety staff; Well-equipped first aid equipment; Alternative sailing route.	Throughout the project life time	Proponent Contractor Project staff	20000
Increased conflicts	Develop proper measures to reduce conflicts Constitute a Conflict Resolution Committee Sensitize farmers and local community on expected cultural change	No. of cases reported Presence of Conflict-resolution committee No. of awareness meetings and publicity materials produced	Periodically	Project Proponent Local administration BMU KeFS	20000

Early pregnancies and broken marriages	Community and students' sensitization and awareness programmes Use of legal mechanisms	No. of sensitization meetings held Minutes and attendance list of the meetings No. of early pregnancies reported	Periodically	Proponent Local administration Education stakeholders Public Health	20000

9.4 EMP during decommissioning phase

Potential Impact	**Proposed Mitigation Measures**	**Timeframe**	**Responsibility**	**Estimated cost (Ksh)**
Economic decline	Prepare and issue recommendation letters to employees to seek alternative employment opportunities; Train employees on alternative livelihoods; Review potential job opportunities in other on-going contracts and recommend the employees who qualify; Comply with the labor laws by paying the employees their terminal dues.	During decommissioning	Proponent Contractor Project staff BMU	20000
Accidents during dissembling of oyster culture infrastructure	All farmers and other workers will be sensitized before the exercise on how to control accidents; Adherence and enforcement of safety procedures; All farmers and other workers will be provided and instructed to use protective attire;	During decommissioning	Project proponent Project Contractor Project staff Public Health Officer Ministry of Labour NEMA	10000

	Dissembling work will be limited to daytime only to avoid workers accidents due to poor visibility; Provision of fully equipped first aid kits on site.			
Dissembling debris and related waste	Reuse and/or recycle what is reusable and recyclable; Contract a private NEMA authorised waste handler to manage the debris/wastes; Careful collection of debris/wastes to minimize injuries; Dump the waste in authorised and gazetted sanitary landfills; Provision of protective gear to all workers involved in waste collection; Donate to the community some reusable items.	During decommissioning	Project proponent NEMA inspectors Contractor	20000

CHAPTER TEN

10.0 CONCLUSION AND RECOMMENDATION

10.1 Conclusion

The Gazi oyster farming project, once implemented as designed, will contribute to improved socioeconomic improvement of the Gazi area, source of revenue to the proponent, BMU, national and County government, and source of income to individual fisher households, in addition to the numerous ecological benefits as cited in this report that include creation of artificial reefs that will enhance the production and abundance of fish species and other marine organisms in the area. The project will ultimately open up the Gazi area; needless to mention that it is will also contribute towards the achievement of the environmental and conservation agenda as enshrined in various pieces of legislation.

The Environmental and Social Impact Assessment undertaken under this project revealed that the anticipated economic benefits to the local community, and the county and country in general are more than the anticipated negative impacts. Further, the identified anticipated environmental and social negative impacts are only short term and localized, and will be mitigated using the mitigation measures as stipulated in Chapter 8 of this report.

10.2 Recommendations

- This project should be approved for implementation subject to the Proponent's commitment to the adherence of the mitigation measures herein. This will minimize the impacts and enhance the benefits of the project.
- The project should be subjected to annual environmental audits to ensure compliance to environmental regulations.

It is therefore the considered view of the Consultant that the project be cleared for implementation so that the project's stakeholders may enjoy the benefits associated with it.

REFERENCES

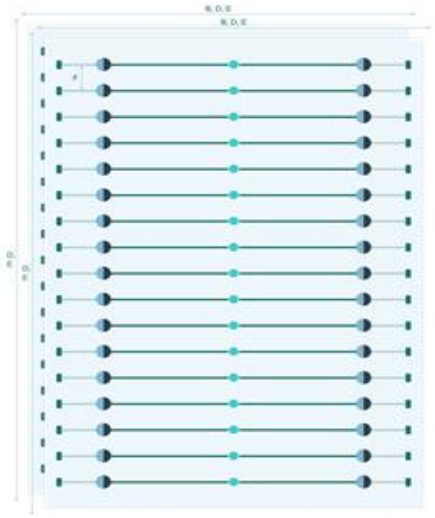
1. EMCA (Environmental Management and Coordination At (1999)
2. EMCA 1999 (amended in 2015)
3. FAO, Food and Agriculture Organization of the United Nations (2016). Fishery and Aquaculture Country Profiles: The Republic of Kenya
4. IUCN – International Union for Conservation of Nature
5. Kanyange, W.N. 2006. Data management tool to assess the status of artisanal reef fisheries: case of Diani - Chale and Gazi, Kenya. M. Sc. thesis. Vrije Universiteit Brussel, Belgium.
6. KNBS (2019): Kenya Population and Housing Census. Volume 1. Population by county and sub county
7. Samoilys M.A. & Kanyange, W.N. 2008. Natural Resource Dependence Livelihoods Development: Perceptions from Tanga, Tanzania. IUCN ESARO 2008.
8. Samoilys M.A. & Kanyange, W.N.2008. Natural Resource Dependence Livelihoods Development: Perceptions from Kiunga, Kenya. IUCN ESARO 2008.

APPENDIX

Appendix 1: Project Layout Plans

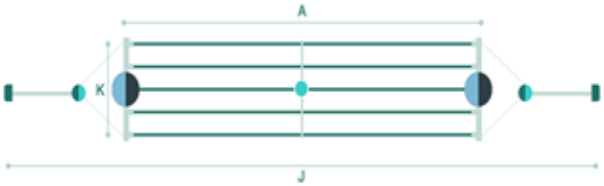
- **SWAHILI COAST FARMS**
- FARM DESIGN VIEW

B. Array length - 116 Meters
D. Minimum site area - Length:116 M Width: 247M
E. Gear area Length: 116M Width: 247M
F. Array spacing 12M

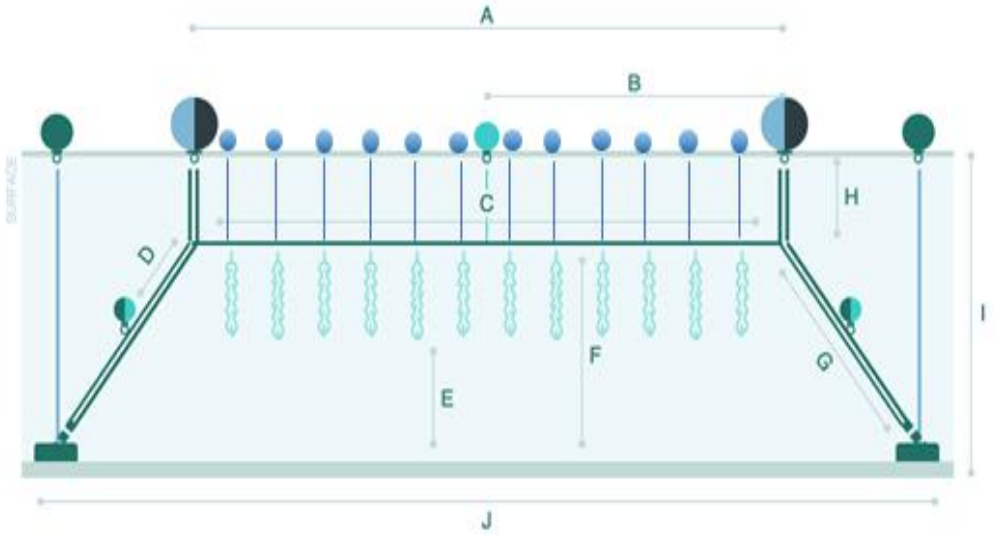


5-Line Array Design View

A. Growline footprint - 60M
B. Growline floatation buoy spacing 30M
C. Growline length 60M
D. Tension bouy distance from spreader 3M
E. Lantern clearance 5M
F. Growline clearance 8M
G. Anchor rode length 30M
H. Growline depth 1M
I. Water depth 10M
J. Array length 116M
K. Array width 3M



CROSS-SECTIONAL DIAGRAM



Appendix 2: Public Consultation meeting minutes

STAKEHOLDER MEETING TO DISCUSS THE ENVIRONMENTAL AND SOCIAL ISSUES RELATED TO THE ESTABLISHMENT OF GAZI OYSTER FARM

VENUE: BMU HALL, GAZI. **DATE**: 07/10/2022

MEMBERS PRESENT:

See the attached lists.

AGENDA

1. Introduction
2. Brief scope of the project
3. Appraisal of impacts and mitigation measures
4. Stakeholder deliberation/Feedback on issues that arose
5. Way forward
6. Adjournment

MIN 1: INTRODUCTION

The meeting began at 10.30am with opening remarks by Mr. Bakari, the proponent. He then introduced the EIA officials, neighbours and stakeholders present. The proponent further explained to the members present on the intended Oyster Farm (*Crassostrea gigas*) undertaking, motivation towards the investment as the need to bridge the market gap and give back to the society. The EIA officials took lead from the proponent in explaining the structure and need for oyster farming in detail.

MIN 2: BRIEF SCOPE OF THE PROPOSED PROJECT

Through the BMU chair, Mr. Jumaa who also acted as the chair of the meeting, the EIA experts made a presentation on the size and structure of the oyster farming undertaking. They illustrated these with well elaborated slides that had graphics on methods and appearance of the oysters. Challenges facing the oyster farming sector were also addressed.

MIN 3: APPRAISAL OF IMPACTS AND MITIGATION MEASURES

Anticipated positive and negative impacts of the proposed projects were discussed citing experiences in other countries which have implemented oyster rearing. To garner understanding and support of the project by stakeholders, all the negative impacts were accompanied with mitigation measures that shall be put in place by the proponent and contractor to ensure as minimum disturbance to the environmental, social and economic life of Gazi.

MIN 4: STAKEHOLDER DELIBERATION AND FEEDBACK ON ISSUES RAISED

Having understood the potential risks and benefits associated with the intended development the stakeholders were given a chance to raise their issues and suggestions. Stakeholders pointed out their issues and sought clarification on matters explained to them. The following is a summary of issues raised and responses made.

ISSUE: Need of the fishermen to know how the project might cause hindrance on the normal fishing and sailing activities.

ANSWER: The project area shall be demarcated clearly to avoid any hindrances to fishing and sailing at sea. However, the area shall serve as a fish aggregation centre where controlled fishing activities shall take place under supervision of the project management to avoid tampering with the project structures.

ISSUE: There is likelihood of the project implementation team using chemicals that are going to kill or make fish to migrate from the fishing areas.

ANSWER: No artificial substances shall be added. The oyster cultures shall employ purely filter feeding method. Moreover, the triploid spat shall come with an accompaniment of health certificates and clear definitions of their original environmental conditions.

ISSUE: It is expected that the project will be tampered with by ill-intentioned people in the ocean at night. How shall the management protect the project against such vandalism cases?

ANSWER: There shall be a security team in place. Also, the project shall have buoys lit around the boundary to reduce invasions. Some members of the community are also willing to counter any trespass cases they will find.

ISSUE: Some previous projects implemented in the region have come with benefits to the immediate communities. What does Swahili Coast Farms do regarding that?

ANSWER: The proponent has a community benefits scheme which includes a scholarship program to well performing students in the community, training to members of the BMUs, construction of a culvert bridge for ease of access to the BMU landing site, renting the unused BMU offices, provision of cooling services to the BMUs and the BMU kitty boost of Ksh.1 for each kilogram of oyster sold.

ISSUE: There is possibility of breach of the promises made by the proponent during implementation of the progress. How can the stakeholders hold the proponent responsible?

ANSWER: There shall be an agreement signed with the BMUs accompanying the "LETTER OF NO OBJECTION" which shall protect the community.

ISSUE: Programs coming to the community experience mass labour importation, failing to secure opportunities to local people especially the youth.

ANSWER; There shall be no outsourcing of employees from outside Gazi unless there is lack of personnel with the required expertise. Most of the workers such as divers, security, sorting and grading shall be done by the local people. Women shall be resourceful in the sorting and grading stages.

ISSUE: How long shall the project stay in the area?

ANSWER: As long as there shall be any notable negative environmental and socio-economic impacts.

MIN 5: WAY FORWARD

Following the inputs from various speakers, the residents were welcomed the project while giving the proponent points of adjustments in his business. They emphasized on the drafting and actualization of an MoU between the local community and the proponent as a binding tool.

MIN 6: ADJOURNMENT

Since there was no any other outstanding issue, the meeting was adjourned at 11.50 am with prayers from Mr. Siaba Mohammed.

Minutes Prepared by:

:……. Sign……

Minutes Confirmed by:

……..... Sign……..

Appendix 3: LIST OF PARTICIPANTS FOR THE STAKEHOLDERS MEETING HELD AT GAZI BMU HALL

FOR THE GAZI OYSTER FARM STAKEHOLDER/COMMUNITY PARTICIPATION MEETING

ATTENDANCE LIST

S/NO	NAME	ORGANIZATION	GENDER	PHONE NUMBER	SIGN
1	MWINYI MAKAME	B.M.U	MALE	0711530792	
2	SHIKELI IDD IBRAHIM	GAZI YOUTH GROUP	MALE	070[illegible]5181	
3	FURAHA RAJAB	GAZI YOUTH GROUP	Female	0792823736	
4	HADIJA SALIM	BMU Member	female	0722807382	
5	[illegible]	GAZI YOUTH GROUP	Male	0706[illegible]	
6	ALI MBWANA	Gazi youth	M	0700933316	
7	FATUMA MOHAMMED	Seaweed group	F	07022244[illegible]	
8	MWANAMISI BAKARI	BMU member	F	0721135315	
9	SAUDA HAMADI	Seaweed group	F	0111771023	
10	KWEKWE HAMAD	B-M-U	F	070848[illegible]	
11	MARIAM SALIM	Seaweed group	F	0772278311	
12	[illegible]	B.M.U	Male	[illegible]	
13	Fadhili [illegible]	B.M.U	Male	[illegible]	
14	MWANAHAWA BAKARI	Seaweed group	F	0712124376	
15	Siabe Mohammed	GAZI YOUTH GROUP	Male	0790995560	
16	OMAR HAMAD	Gazi youth GR	M	070871-6575	
17	FATUMA RASHID	Seaweed group	F	0702814067	
18	SAUMU ALI	GAZI YOUTH GROUP	F	0795525050	
19	MWANAIDI SAID	BMU	F	070654094[illegible]	
20	BIASHA AMURI	GAZI YOUTH GROUP	F	07699177[illegible]	
21	SAUMU [illegible]	GAZI YOUTH GROUP	F	[illegible]	
22	BILALI ALI	GAZI YOUTH GROUP	MALE	0769593287	
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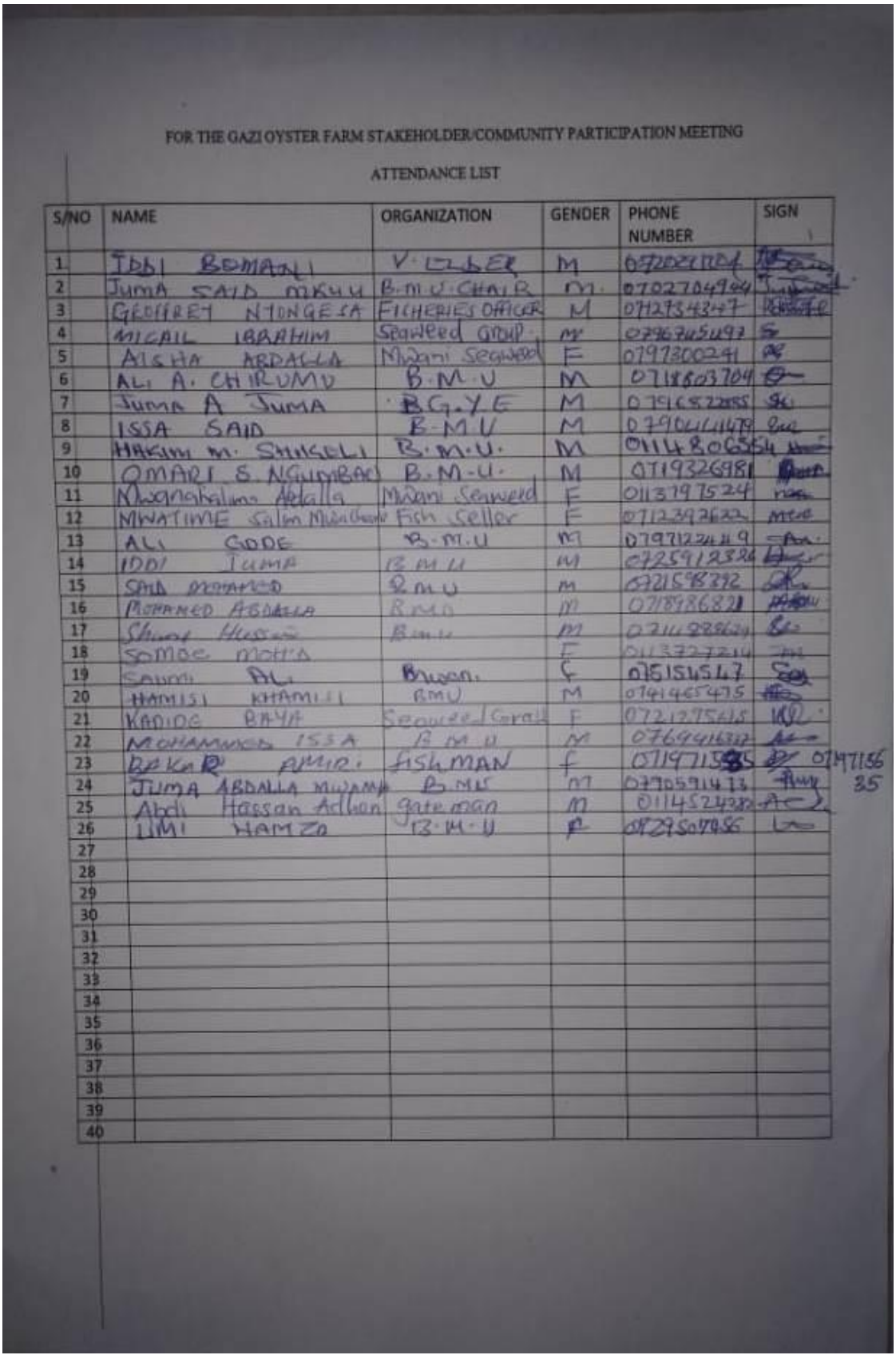

FOR THE GAZI OYSTER FARM STAKEHOLDER/COMMUNITY PARTICIPATION MEETING

ATTENDANCE LIST

S/NO	NAME	ORGANIZATION	GENDER	PHONE NUMBER	SIGN
1	IDDI BOMANI	V. LEADER	M	0720221104	
2	JUMA SAID MKUU	B.M.U CHAIR	M	0702704964	
3	GEOFFREY NYONGESA	FISHERIES OFFICER	M	0712734347	
4	MICAIL IBRAHIM	Seaweed GROUP	M	0796745497	
5	AISHA ABDALLA	Mwani Seaweed	F	0799300241	
6	ALI A. CHIRUMU	B.M.U	M	0718603704	
7	JUMA A JUMA	B.G.Y.E	M	0791652055	
8	ISSA SAID	B.M.U	M	0790414479	
9	HASSAN M. SHIKELI	B.M.U.	M	0114806554	
10	OMARI S. NGUMBAO	B.M.U.	M	0719326981	
11	Mwanahalima Abdalla	Mwani Seaweed	F	0113797524	
12	MWATIME Salim Mwachome	Fish Seller	F	0712397622	
13	ALI GODE	B.M.U	M	0797122419	
14	IDDI JUMA	B.M.U	M	0725912326	
15	SAID MOHAMED	B.M.U	M	0721598392	
16	MOHAMED ABDALLA	B.M.U	M	0718986821	
17	Shimo Hussein	B.M.U	M	0714989624	
18	SOMOE MOHA		F	0113727214	
19	SAUMU ALI	Bwani.	F	0715145147	
20	HAMISI KHAMISI	BMU	M	0741465475	
21	KADIDE BAYA	Seaweed Group	F	0721275415	
22	MOHAMMED ISSA	B.M.U	M	0769461312	
23	BAKARI AMIR.	FISHMAN	f	0719715835	0747186 35
24	JUMA ABDALLA MWAMA	B.M.U	M	0790591473	
25	Abdi Hassan Adhan	gate man	M	0114524938	
26	UMI HAMZA	B.M.U	F	0729507856	
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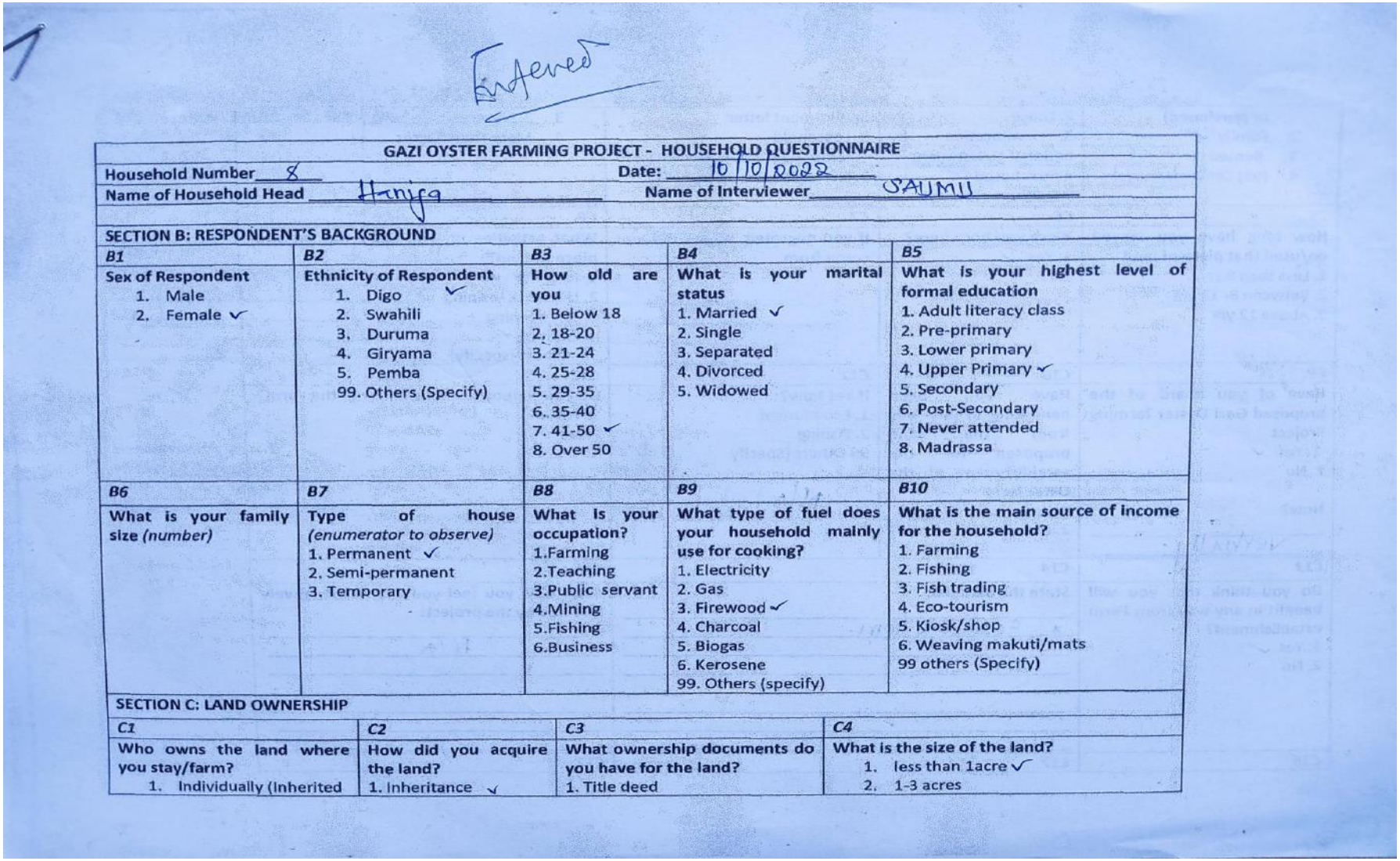
Appendix 5: Sample of completed questionnaires



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GAZI OYSTER FARMING PROJECT - HOUSEHOLD QUESTIONNAIRE

Household Number 8 Date: 10/10/2022

Name of Household Head Hanifa Name of Interviewer SAUMU

SECTION B: RESPONDENT'S BACKGROUND

B1	B2	B3	B4	B5
Sex of Respondent 1. Male 2. Female ✓	Ethnicity of Respondent 1. Digo ✓ 2. Swahili 3. Duruma 4. Giryama 5. Pemba 99. Others (Specify)	How old are you 1. Below 18 2. 18-20 3. 21-24 4. 25-28 5. 29-35 6. 35-40 7. 41-50 ✓ 8. Over 50	What is your marital status 1. Married ✓ 2. Single 3. Separated 4. Divorced 5. Widowed	What is your highest level of formal education 1. Adult literacy class 2. Pre-primary 3. Lower primary 4. Upper Primary ✓ 5. Secondary 6. Post-Secondary 7. Never attended 8. Madrassa
B6	**B7**	**B8**	**B9**	**B10**
What is your family size *(number)*	Type of house *(enumerator to observe)* 1. Permanent ✓ 2. Semi-permanent 3. Temporary	What is your occupation? 1.Farming 2.Teaching 3.Public servant 4.Mining 5.Fishing 6.Business	What type of fuel does your household mainly use for cooking? 1. Electricity 2. Gas 3. Firewood ✓ 4. Charcoal 5. Biogas 6. Kerosene 99. Others (specify)	What is the main source of income for the household? 1. Farming 2. Fishing 3. Fish trading 4. Eco-tourism 5. Kiosk/shop 6. Weaving makuti/mats 99 others (Specify)

SECTION C: LAND OWNERSHIP

C1	C2	C3	C4
Who owns the land where you stay/farm? 1. Individually (Inherited	How did you acquire the land? 1. Inheritance ✓	What ownership documents do you have for the land? 1. Title deed	What is the size of the land? 1. less than 1acre ✓ 2. 1-3 acres

or purchased) 2. Family ✓ 3. Rented 4. (99) Others (specify)	2. Lease 3. Allocation by national government 4. Purchased 99. Others (specify)	2. Allotment letter 3. Leasehold 4.Temporary occupation letter 5. None (99) Others (specify)	3. 3.1-5acres 4. More than 5acres
C5	**C6**	**C7**	**C8**
How long have you stayed on/used that piece of land 1. Less than 8 yrs 2. Between 8- 12 yrs 3. Above 12 yrs ✓	**Were you born here?** 1. Yes ✓ 2. N	**If you migrated, where did you come from**	**What activities do you carry out on your piece of land?** 1. Farming ✓ 2. Livestock keeping 3. Bee keeping 4. Poultry ✓ 99. Others (specify)
C9	**C10**	**C11**	**C12**
Have of you heard of the proposed Gazi Oyster farming Project 1. Yes ✓ 2. No **How?** Verbally.	**Have you been benefiting in any way from the land proposed for the establishment of the Oster farm** 1. Yes 2. No ✓	**If Yes how?** 1. Eco tourism 2. Fishing 99 Others (Specify N/A	**Do you support establishment of the Farm?** 1. Yes ✓ 2. No
C13	**C14**		**C15**
Do you think that you will benefit in any way from Farm establishment? 1. Yes ✓ 2. No	**State the benefits:** * Eco-system.		**State how you feel you will be negatively affected by the project:** N/A
C16	**C17**		**C17**

Are there any critical habitats (corals, sea grass) in the proposed project site?	Are there any archeological sites in the proposed project site?	State the environmental/ecological benefits of the project
1. Yes 2. No ✓	1. Yes 2. No ✓	* Increasement of fish and other sea creatures.
C18 **State the environmental/ecological disadvantages of the project** N/A		

Respondent's Details:

Name: Hanifa

ID: 10226203

Signature: [signature]

Date: 10/10/2022

Entered

GAZI OYSTER FARMING PROJECT - HOUSEHOLD QUESTIONNAIRE

Household Number 9 **Date:** 9/10/2022

Name of Household Head Mlisho Shaban **Name of Interviewer** Saumu

SECTION B: RESPONDENT'S BACKGROUND

B1	*B2*	*B3*	*B4*	*B5*
Sex of Respondent 1. Male ✓ 2. Female	**Ethnicity of Respondent** 1. Digo ✓ 2. Swahili 3. Duruma 4. Giryama 5. Pemba 99. Others (Specify)	**How old are you** 1. Below 18 2. 18-20 3. 21-24 4. 25-28 ✓ 5. 29-35 6. 35-40 7. 41-50 8. Over 50	**What is your marital status** 1. Married 2. Single ✓ 3. Separated 4. Divorced 5. Widowed	**What is your highest level of formal education** 1. Adult literacy class 2. Pre-primary 3. Lower primary 4. Upper Primary ✓ 5. Secondary 6. Post-Secondary 7. Never attended 8. Madrassa
B6	***B7***	***B8***	***B9***	***B10***
What is your family size *(number)* 4	**Type of house** *(enumerator to observe)* 1. Permanent ✓ 2. Semi-permanent 3. Temporary	**What is your occupation?** 1.Farming 2.Teaching 3.Public servant 4.Mining 5.Fishing ✓ 6.Business	**What type of fuel does your household mainly use for cooking?** 1. Electricity 2. Gas 3. Firewood ✓ 4. Charcoal 5. Biogas 6. Kerosene 99. Others (specify)	**What is the main source of income for the household?** 1. Farming 2. Fishing ✓ 3. Fish trading ✓ 4. Eco-tourism 5. Kiosk/shop 6. Weaving makuti/mats 99 others (Specify)

SECTION C: LAND OWNERSHIP

C1	*C2*	*C3*	*C4*
Who owns the land where you stay/farm? 1. Individually (Inherited	**How did you acquire the land?** 1. Inheritance ✓	**What ownership documents do you have for the land?** 1. Title deed	**What is the size of the land?** 1. less than 1acre ✓ 2. 1-3 acres

or purchased) 2. Family ✓ 3. Rented 4. (99) Others (specify)	2. Lease 3. Allocation by national government 4. Purchased 99. Others (specify)	2. Allotment letter 3. Leasehold 4.Temporary occupation letter 5. None (99) Others (specify)	3. 3.1-5acres 4. More than 5acres
C5	**C6**	**C7**	**C8**
How long have you stayed on/used that piece of land 1. Less than 8 yrs 2. Between 8- 12 yrs 3. Above 12 yrs ✓	**Were you born here?** 1. Yes ✓ 2. N	**If you migrated, where did you come from**	**What activities do you carry out on your piece of land?** 1. Farming 2. Livestock keeping 3. Bee keeping 4. Poultry 99. Others (specify) N/A
C9	**C10**	**C11**	**C12**
Have of you heard of the proposed Gazi Oyster farming Project 1. Yes ✓ 2. No **How?** Verbally	**Have you been benefiting in any way from the land proposed for the establishment of the Oster farm** 1. Yes ✓ 2. No	**If Yes how?** 1. Eco tourism 2. Fishing ✓ 99 Others (Specify	**Do you support establishment of the Farm?** 1. Yes ✓ 2. No
C13	**C14**		**C15**
Do you think that you will benefit in any way from Farm establishment? 1. Yes ✓ 2. No	**State the benefits:** * fishing		**State how you feel you will be negatively affected by the project:** N/A
C16	**C17**		**C17**

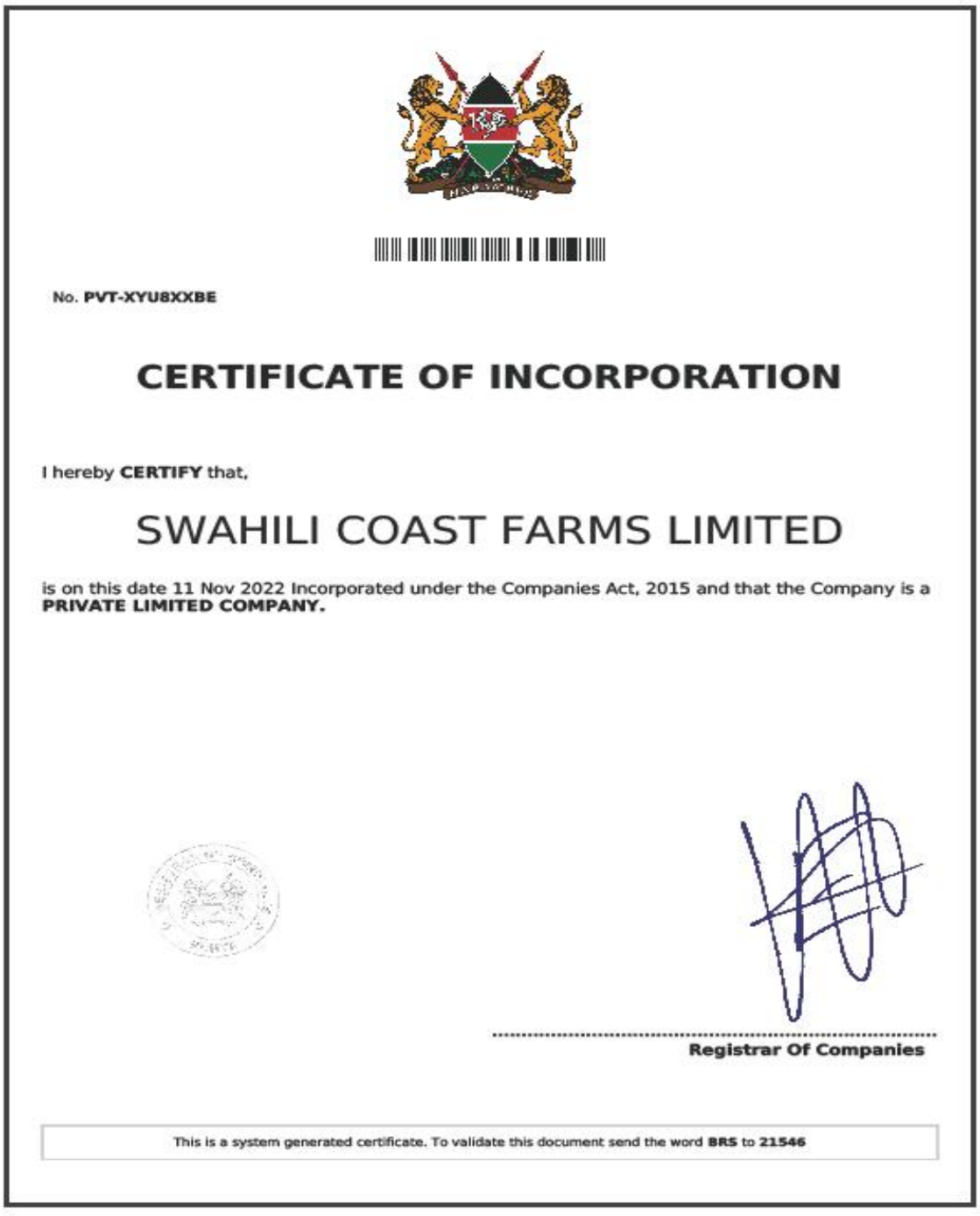
Are there any critical habitats (corals, sea grass) in the proposed project site? 1. Yes 2. No ✓	Are there any archeological sites in the proposed project site? 1. Yes 2. No ✓	State the environmental/ecological benefits of the project N/A * Increasement of fish.
C18		
State the environmental/ecological disadvantages of the project N/A		

Respondent's Details:

Name: Mlisho Shaban **ID:** 32249049

Signature: [signature] **Date:** 9/10/2022.

Appendix 4: Proponent's Registration Certificate



No. **PVT-XYU8XXBE**

CERTIFICATE OF INCORPORATION

I hereby **CERTIFY** that,

SWAHILI COAST FARMS LIMITED

is on this date 11 Nov 2022 Incorporated under the Companies Act, 2015 and that the Company is a **PRIVATE LIMITED COMPANY.**

Registrar Of Companies

This is a system generated certificate. To validate this document send the word **BRS** to **21546**

Appendix 5: Proponent's KRA PIN Certificate

KENYA REVENUE AUTHORITY

www.kra.go.ke

PIN Certificate

For General Tax Questions
Contact KRA Call Centre
Tel: +254 (020) 4999 999
Cell: +254(0711)099 999
Email: callcentre@kra.go.ke

Certificate Date : 11/11/2022

Personal Identification Number
P052165716U

This is to certify that taxpayer shown herein has been registered with Revenue Authority

Taxpayer Information

Taxpayer Name	SWAHILI COAST FARMS LIMITED
Email Address	swahilicoastfarms@gmail.com

Registered Address

L.R. Number : NA	**Building :** AKILA TWO ESTATE
Street/Road : MBAGATHI WAY	**City/Town :** NA
County : Nairobi	**District :** Langata District
Tax Area : Madaraka	**Station :** South of Nairobi
P. O. Box : 30670	**Postal Code :** 00100

Tax Obligation(s) Registration Details

Sr. No.	Tax Obligation(s)	Effective From Date	Effective Till Date	Status
1	Income Tax - Company	11/11/2022	N.A.	Active

The above PIN must appear on all your tax invoices and correspondences with Revenue Authority. Your accounting end month is December unless a change has been approved by the Commissioner-Domestic Taxes Department. The status of Tax Obligation(s) with 'Dormant' status will automatically change to 'Active' on date mentioned in "Effective Till Date" or any transaction done during the period. This certificate shall remain in force till further updated.

Disclaimer : This is a system generated certificate and does not require signature.

Appendix 7: Letter of 'No' from Gazi BMU

LETTER OF NO OBJECTION

DATE:

To whom it may concern,

Hereby letter shows refer to No Objection For **Swahili Coast Farms Limited** if they set up their project on the proposed location and set up an onshore facility on Gazi landing site. Gazi BMU representing the fishermen and Gazi Chief representing the community are satisfied with the benefits the project brings and look forward to a cordial relationship. This letter is issued as per request.

Sincerely,
Gazi BMU Chairman
Signature

GAZI B.M.U
P.O. Box 5
VIA MOMBASA-KENYA

Appendix 8: Lead Expert's Practicing License

FORM 7 (s.16(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/EISPL/18980

Application Reference No: NEMA/EIA/EL/24988

M/S **JOSEPH TUNJE**
(individual or firm) of address
P.O. Box 185 - 80108 MOMBASA

is licensed to practice in the capacity of a (lead Expert/Associate Expert/Firm of Experts) **Lead Expert General**

registration number 1290

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

Issued Date: 2/9/2023 Expiry Date: 12/31/2023

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001:2015 Certified