

**ENVIRONMENTAL AND SOCIAL MANAGEMENT  
PLAN  
FOR  
THE NATIONAL AQUACULTURE RESEARCH AND  
DEVELOPMENT TRAINING CENTRE, SAGANA,  
KIRINYAGA COUNTY**

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**Proponent:**

The Centre Director  
National Aquaculture Research and Development Training Centre,  
Sagana  
Kirinyaga County, KENYA

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**Submitted To:**

The County Director of Environment

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Kirinyaga County

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<b>Proposed project: -</b>	TAAT II PROGRAM – Promotion through Dissemination of Aquaculture Technologies
<b>Location: -</b>	Sagana Fish Farm
<b>Date:</b>	June, 2022

## CERTIFICATION

The Environmental and Social Impact Assessment (ESIA)/Summary Project Report (SPR) for the proposed TAAT II Program-Promotion of Dissemination of Aquaculture Technologies in National Aquaculture Research Development and Training Centre (NARDTC), Sagana in Kirinyaga County. This SPR has been carried out according to the Environmental Management and Coordination Act, 2015, Environmental (Impact Assessment and Audit) Regulations, 2019 and the NEMA Public Legal Notice 31 on processing of EIA reports of April 31, 2019. To the best of my knowledge, all information contained in this report is accurate and a truthful representation of all findings as relating to the proposed Site Situation with respect to the TAAT II support.

### **CERTIFICATION BY EXPERTS**

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## **Abbreviations/Acronyms**

AfDB	African Development Bank
AQC	Aquaculture Compact
ATA	Agricultural Transformation Agenda
CGA	Cereal Growers Association
CGIAR	Consultative Group for International Agricultural Research
CIAT	Centro Internacional Agricultura Tropical
E&S	Environmental and Social
E&S	Environmental and Social
EA	Environmental Audit
EIA	Environmental Impact Assessment
EMCA	Environment Management and Coordination Act
ENABLE	Empowering Novel Agribusiness – Led Employment
ES	Environmental and Social
ESA	Environmental and Social Audit
ESAP	Environmental and Social Assessment Plan
ESMP	Environmental and Social Impact Assessments
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
FAW	Fall Army Worm
GAPs	Good Agricultural Practices
GCHM	Grievance Conflict Handling Mechanism
GIIP	Good International Industry Practice
GIS	Geographical Information System
GPS	Global Positioning System
HIB	High Iron Bean
ICARDA	International Centre for Agricultural Research in Dry Areas
ICRISAT	International Crops Research Institute for Semi-Arid Tropics
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
IPM	Integrated Pest Management
ISFM	Integrated Soil Fertility Management
ISS	AfDB Integrated Safeguards System
ITCZ	Inter-Tropical Convergence Zone
IYA	Impact and Growth of Youth in Agribusiness
KALRO	Kenya Agriculture and Livestock Research Organization
KIIs	Key Informant Interviews
NARDTC	National Aquaculture Research Development Training Centre
NARES	National Agricultural Research and Extension Systems
NARS	National Agricultural Research Systems

NEMA	National Environment Management Authority
OS	Operational Safeguards
PDO	Program Development Objective
PIAs	Priority Intervention Areas
PIU	Project Implementation Unit
PMU	Portfolio Management Unit
PSC	Project Steering Committee
RMCs	Regional Member Countries
SOPs	Standard Operational Procedures
SPR	Summary Project Report
TAAT	Technologies for Africa Agricultural Transformation
ToR	Terms of Reference

## **Executive Summary**

### **Project Description**

National Aquaculture Research Development and Training Centre (NARDTC), Sagana is one of the sites TAAT II Program has selected in Kenya. Sagana Centre is located about 2 km within Sagana Township in Kirinyaga County, approximately 104 Km Northeast of Nairobi City. The Centre occupies an area of approximately 59.37 hectares with 109 operational ponds of which 72 (150 m<sup>2</sup>) are research ponds, and the rest used for spawning, fingerling production and grow-out production. The farm is supplied with water from River Ragati by gravity all-year round. This Environmental and Social Management Plan (ESMP), therefore, has been prepared for TAAT II Program for NARDTC Site Kenya being phase two of the TAAT I Aquaculture Compact. TAAT Aquaculture compact (TAAT-AQC), African Development seeks to disseminate and upscale aquaculture technologies with a view to increasing aquaculture value chain actors' productivity, increase fish protein consumption and enhance sustainability across the value chain.

### **Objective of the ESMP**

The ESMP study sought to identify impacts the TAAT II Program - Aquaculture compact would have on the biophysical and social environments and investigate other causes generating the impacts on the project and propose mitigation measures. The findings were to identify and categorize impacts of the proposed project on this site, develop and propose mitigation interventions to prevent or ameliorate adverse impacts that may arise. The social aspect of the study investigated potential impacts of the proposed site on resident as well as neighboring communities, their social-cultural fabric, and livelihoods. Mitigation and intervention measures were developed to enhance positive impacts and minimize potentially negative impacts and outcomes. An environmental and social management and monitoring plan (ESMMP) for the proposed project was developed from the ESMP study.

### **Applicable Legislation**

This ESMP conforms to the spectrum of legislation and regulations that apply to Low-risk Category of projects according to NEMA classified projects in Kenya that may have deleterious and unforeseen adverse impacts. According to EMCA 1999 reviewed 2013, 2015, and The Environmental (Impact Assessment and Audit)-EIA/EA (Amendment) Regulations, 2019, the scope of activities proposed by TAAT Program II, in Kenya under aquaculture is under category of projects exempted for the full Environmental and Social Impact Assessment. According to the National Environment Management Authority (NEMA) legal notice no. 31 of April 30, 2019, the environmental management and coordination Act (no. 8 of 1999) amendment of the second schedule; the activities under the aquaculture compact are classified (2) medium risk projects (6) Agriculture related activities...(d) aquaculture not exceeding 1 ha.; (7) (c) Fish processing plants; (j) any other food-processing plants or agro-based processing plants; and (10) waste disposal including... And also, in reporting, NEMA legal notice no. 32 the environmental management and coordination Act (no. 8 of 1999) requires that every proponent undertaking a project specified in the Second Schedule of the Act as being a low-risk project or a medium risk project submits a Summary Project Report (SPR). In addition, the Aquaculture Compact falls under Category 2 of the AfDB Bank Integrated safeguards systems (ISS). Category 2 projects are likely to have less

adverse site-specific environmental and/or social impacts as experienced in Category 1 projects. Envisioned impacts are few in number, site-specific, largely reversible, and readily minimized by applying appropriate management and mitigation measures or incorporating internationally recognized design criteria and standards.

### **ESMP methodology**

The ESMP study was conducted between February 2022 and March 2022. Baseline data was collected through initial desk top review for secondary data and subsequent field visit for primary data collection. The environmental and social study documented the state of the environment, biophysical features and socio-economic facets, land use patterns, activities, and other processes that may impact the project. Key informant interviews and consultations were conducted with stakeholders considered as resource users, workers, owners, mandated regulatory authorities, and those with activities that may be impacted by the proposed project. A community consultation was held for awareness creation, information gathering, and public disclosure of the project. Questionnaires were administered at focused group level generated data on demographic parameters, resource use, and ownership, socio-economic profiles, and other aspects.

### **Baseline conditions**

Sagana is situated at the edge of a large plain at the southern foot of Mt. Kenya. The prevailing complex matrix of topography, geology, soil characteristics, and climatic set-up render the project naturally prone to erosion, contamination, and sedimentation unless a careful system is in place and well maintained. The basin experiences bimodal rainfall pattern due to the inter-tropical convergence zone (ITCZ). The long rain season is from March to May while the short rain season is from September to December. Soils were formed on volcanic rocks from Mt. Kenya. The soils are of two soil types found at Sagana, Kenya, black clay soil (eutric Vertisol) and a red clay soil (chromic Cambisol) and have the capacity to retain nutrients from pond effluent. Some areas with black cotton soils indicate that the soils have formed under restricted drainage conditions, which are the result of low rainfall and the presence of level to moderate slopes. The vegetation is mainly acacias interspersed with exotic tree plantations.

Sagana township and its periurban activities point to a rich agricultural land. The community here is mainly on irrigated rice which is the main source of income not just to the households but to women. Its women who are hawking rice in town, and others have stores where they sell from. The land is also rich in fruits and vegetables with the main market in Nairobi. Sagana township has sprout from rice economy.

### **TAAT Program**

The overall Program development objective of TAAT is to execute a bold plan to achieve rapid agricultural transformation across Africa through raising agricultural productivity in selected Priority Intervention Areas (PIAs) targeting specific agricultural commodity value chains. The PIAs include:

- achieving Self-sufficiency in Inland Fish Production.
- cassava Intensification.
- expanding Horticulture- This includes Vegetables, Sweet Potato, Banana/Plantain and Beans.



- Food Security in the Sahel – The priority **value** chains include Pearl Millet, Sorghum.
- Groundnut, Cowpea, Beef, Small Ruminant Meat and Poultry.
- increasing Africa's Wheat Production; and
- revitalizing Tree Plantations - This includes Oil Palm, Cashew, Coffee, and Cocoa.
- self-sufficiency in Rice Production.
- transforming African Savannahs into Breadbaskets- This PIA will focus on Maize, Soybean, Poultry, Yam, Dairy.

### **Program components**

TAAT will support centrally managed activities and promote key technologies in selected countries. The overall TAAT activities is proposed in 35 countries and 23 Commodity value chains albeit in three tiers<sup>1</sup> and include Program management and coordination, Program services (including policy support, capacity development and outreach, youth in agribusiness support and the services of the Clearinghouse), and core implementation activities of the agricultural commodity value chains. The Program will demonstrate the applicability of proven technologies in each PIA/value chains to engender and catalyze downstream investments from the private and public sectors as well as development partners. It will be implemented through the following components:

Component one: Creation of an enabling environment for technology adoption by farmers via a seed system, technology release and registration policies that are regionally harmonized

Under this TAAT will review national and regional policies on variety release, registration, and the seed system with an aim of harmonizing them to fast track the release of technologies across similar agro-ecological zones.

Component two: A Regional Technology Delivery Infrastructure (RTDI) or TAAT platform that is able to provide and deploy needed food production technologies and any additional adaptive research required.

Under this, RTDI will develop a menu of food production technologies and work with RMCs, as represented by NARES and the private sector, to develop a proposal to take these technologies to scale.

Component three: Deployment of appropriate food production technologies, through crop/livestock campaigns in RMCs.

TAAT will engage CGIAR/RTDI and other technology providers to develop a menu of proven food production technologies, namely: seed system or artificial insemination guidelines (technical manuals) for large scale deployment of improved varieties/breeds, disease control, improved crop/animal production methods, aquaculture, etc.

Component four: Project management

This will mainly involve day to day management of the project.

**Institutional and implementation arrangement** - IITA shall be the Executing agency for the TAAT Program. In this capacity, IITA will sign Memorandum of Understanding (MoUs) and implementation agreements with each of the Lead Centers/institutions for the various initiatives within the Program. IITA will act through a Program Management Unit (PMU) composed of staff competitively recruited with the responsibility to manage the whole Program and report to the AfDB. The CGIAR Centers responsible for

activities within each commodity value chains will act through Project Implementation Units (PIUs) composed of relatively few competitively recruited staff.

### **Public consultation meetings, key informant interview**

The consultant organized and convened meetings with stakeholders in liaison with the Centre Management and local leaders as prescribed in EMCA (amendment 2015) that for such a category at least one public consultation. Covid-19 containment guidelines were strictly adhered to, wearing mask, frequent hand washing and sanitizing, and maintaining social distance of 1.5 meters. During these forums, the consultant in close consultation with the client shared the project information in terms of its implementation, predicted impacts, and received the stakeholders concerns as well.

The Environmental and Social Management Plan has been carried out according to the AfDB's Environmental and Social Safeguards framework, Kenya's Environmental and Social policy and legal framework and is in line with the international best practices. During the Study, the following were the main positive and negative impacts of the program site;

### **Environmental and social benefits**

- Increased fisheries production in Kenya
- Increased nutritional status (proteins);
- Increased business enterprises for the aquaculture farmers and other value chain players
- Improved food security in Kenya
- Reduced malnutrition

### **Environmental and social concerns**

- Risk of accidents e.g. related to drowning of workers
- Risks of spread of COVID 19
- Risks of loss of local fish species

Furthermore, the project will need to follow requirements as specified in the AfDBs integrated safeguards system for category 3 projects, by developing and implementing this ESMP. Therefore, these are the instruments which will be used by the project to ensure that mitigation measures for the expected impacts during planning, and operation phases are enforced and managed. The cost of implementing this ESMP is included in total project cost.

### **Conclusion**

Kenya's National Environment Management Authority (NEMA) recommended that the project should carry out an ESMP which shall need to be approved by the authority being NEMA, and used during project implementation. From the site screening assessment initially done, it is concluded that the project's impacts in this site in Kenya are localized and minimal which means that they are manageable. However, there is a need for the developer to implement ESMP interventions as outlined herein.

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# 1 INTRODUCTION AND BACKGROUND INFORMATION

## 1.1 Introduction

This chapter examines project background information, nature of the project, project location, objectives, justification and SPR study methodology among others.

## 1.2 Background Information

The Sagana Centre was started by the colonial government in 1948 as Sagana Fish Culture Farm (SFCF) later changed to Sagana Aquaculture Centre (SAC) by the Kenyan government at independence. Since independence, the Farm has played a critical role in aquaculture development in Kenya. In 1993, rehabilitation of the farm was done, under the sponsorship of a project funded by the Belgian Government. Renovation of old ponds as well as construction of new ones took place through 1996. Farm operations were partly funded by the Government of Kenya. In 2009, Sagana Fish Farm was transformed to the National Aquaculture Research Development and Training Centre (NARDTC) to spearhead the implementation of the Fish Farming Enterprise Productivity Project under the Economic Stimulus Programme (ESP) (Rahman & Gamal Nairobi - Kenya, n.d.).

KMFRI team at Sagana Centre has been involved in various activities with local and international impact. Locally, there is a continuous effort to educate investors on the development and growth of sustainable aquaculture enterprises of all scales. The Centre further engages in aquaculture capacity building and community outreach activities. Among the outreach activities currently being undertaken by the Centre include establishment and authentication of hatcheries, monitoring of quality seed production and certification, monitoring of quality feed production and certification, establishment of cottage fish feeds, development of feed and seed guidelines and standards, feed and fish quality, training of farmers and hatchery managers. At the national level, the Centre is involved in various projects, including Nile tilapia and Catfish seed and Broodstock improvement through selective breeding programs, feed formulation and production, hatchery development and operations techniques, recruitment of new species into aquaculture and development of value-added aquaculture products (Mcclanahan et al., 2015).

TAAT II may have the following activities on aquaculture:

- stabilization of ponds
- breeding and rearing of new species
- Homemade feeds generation
- Pests and disease control
- Inviting farmers and youth for training
- Capacity building on value addition
- Maintain the water source
- Maintain the landscape around the ponds
- Employ labor to maintain ponds
- Sell out fingerlings (*TAAT AQUACULTURE COMPACT – Taat-Africa, n.d.*)

## 1.3 Project objectives

The objective of the study was to:

1. Assess suitability of the NARDTC, Sagana to host TAAT II Compact and activities.
2. Introduce the key principle behind TAAT II support that only dissemination-based research activities will be supported, and
3. Carry out SPR for the proposed project in accordance with the Environmental Impact and Audit Regulations (Amendment) 2019 and submit report to NEMA for approval.

On the Summary Project Report, it includes; to carry out a socio-economic and social environmental status analysis through a base survey and prepare an Environmental and Social Management Plan (ESMP). EMCA 1999 and subsequent amendment legislation require it before a low-risk project is implemented commences, it must be preceded by a Summary Project Report with the twin objective of offering guidance and leadership in project implementation.

#### **1.4 Justification of the Project**

The Technologies for African Agricultural Transformation (TAAT) program aims to help the project countries fulfil their enormous potential in the sector by employing high-impact technologies to boost output. Fish farming faces many challenges including Low and fluctuating fish prices, Unstable fish volumes aggregated to high cost of installing aquaponics, Low and fluctuating farm incomes and declining quality and quantity of fingerlings by the farmers among others. The project is planning to engage in promoting aquaculture and its technologies to ensure better productivity to the beneficiaries through providing fingerings and improved fish-feed technologies with low-cost production and quality. There is a need for reliable and sustainable fish production. Fish farming therefore requires that every possible measure should be taken to increase production in all seasons through accessibility to adequate and quality fish as well as quality fish feeds. This is what TAAT II will achieve through a calculated support to capacity building for production, and productivity.

#### **1.5 Scope of work**

The scope of the consultancy work involved preparation of SPR for the proposed support to NARDTC improvement of fish and fingerings production and productivity.

To undertake a Summary Project Report as per the NEMA Legal Notice No 31 & 32 of 2019, and EMCA 2003, the Environmental (Impact Assessment and Audit) Regulations, the following outline was adopted:

- a. Describe the context, components, and activities of the project.
- b. Assess and report on the location of the project including the physical area that may be affected by the project.
- c. Identify the potential impact on the community around the proposed site for the projects. Assess whether the activities will displace and or cause loss of livelihood to the surrounding community.
- d. Assess and report the nature, design, and *budget of the project*.
- e. Assess and report on the economic and socio-cultural impacts of the project to the local community and the nation in general.
- f. Assess and report the activities that shall be undertaken during the implementation phases.
- g. Assess and report the materials to be used including waste to be generated especially during operationalization phase and the methods of their disposal.



- h. Identify and assess the potential adverse impacts that may result from the activities of the project on the biophysical and socio-economic environment and develop an environmental management plan for the operationalization and maintenance, including mitigation measures as per NEMA guidelines.
- i. Describe the impacts quantitatively and qualitatively, where possible in terms of environmental costs and benefits. In the Impact analysis, distinguish between positive and negative impacts. In the Impact analysis, distinguish between positive and negative impacts, long and short-term impacts; reversible and irreversible; and identify linkages among project components and the issues.
- j. Identify, assess, and recommend appropriate and practical mitigation measures to remove or minimize the adverse environmental impacts identified.
- k. Develop an action plan that ensures the health and safety of the workers and neighboring communities in the project cycle.
- l. Identify, assess, and recommend impact monitoring programs and compliance auditing programs.
- m. Fill in and submit the NEMA Project Report Form.
- n. Prepare and submit a Summary Project Report to NEMA.
- o. Provide any other information that NEMA may require.
  - i. Assist the Client to get SPR approval.

## **1.6 Methodology and Approach the of SPR**

### **• The Approach of SPR**

This SPR is based on the available baseline information and reports on the proposed project. Among the sectoral issues addressed by the SPR were model, technologies, impacts, waste management; Socio-economic, gender, and socio-cultural issues; environmental conservation, biodiversity, resource use; and occupational health and safety. The latter aspect was considered as crosscutting and therefore, was captured in pertinent sectoral issues. This SPR was prepared in accordance with “*The Environmental (Impact Assessment and Audit) Regulations, 2003*” (Legal notice 31 and 32) for preparation and submission to the National Environmental Management Authority (NEMA).

Preparatory meetings were held with key stakeholders, and technical team at various stages of the assignment. The SPR consultancy team reviewed existing relevant legislations and regulations in Kenya, and E&S documents on the proposed project. The review of literature was to compliment field survey data. During the site visits, some comprehensive field survey data of the proposed project area and its environs was collected. The field survey was based on pre-determined parameters and methodologies used in environmental and social impact assessment and details captured during the site environmental and social screening exercise. The methodologies for field surveys included observations, questionnaire filling, focus group discussions, and interviews with key informants. The social economic data collected was processed by SPSS to establish the existing and expected parameters of social economic status.

The study also examined the socio-economic, gender, and socio-cultural conditions of project beneficiaries. The overall objective of the assessment was to get the views of local residents on the positive and negative impacts of the project and suggest possible mitigation measures. The key issues, which have been addressed during the assessment, included changing social networks, economic opportunities, cultural

beliefs and practices, emerging scenarios with project and community consultation and participation.

- **Mobilization and Planning**

At the commencement of the SPR development, the consultant met with personnel from the Sagana National Aquaculture Research Development and Training Centre (NARDTC) to discuss and agree on the scope of work, confirm the consultancy team understanding on the ToR and agree on the proposed methodology. The project was screened on Environmental and Social impacts after which it was considered as low risk project. According to EMCA 1999 (amended 2019), legal notice 31, and that all projects of low risk before implementation must develop Summary Project Report. During this meeting, the consultant was briefed by the proponent.

- **Desk Review**

The consultant reviewed the relevant available documents on project activities and components. Key documents reviewed included: previous site ESMP, project E&S Documents including the just concluded Site Screening Report under the proposed TAATII.

- **Field Visit, data collection, and analysis**

The consultant conducted a field visit to the proposed project site to obtain data and public consultation with the stakeholders - community members; at least 14 respondents were consulted during these days. The consultant established the nature of the surroundings including existing infrastructure, economic and social set up of the local communities whose normal daily activities will be and/or likely to be affected by the implementation of the proposed project. During the field study, the consultant collected existing information and administered interviews with a view to predict the potential environmental impacts on day-to-day activities of the community due to the implementation of the proposed project.

The consultant thereafter interpreted and used the data collected to prepare a comprehensive environmental and social management plan (ESMP) encompassing the potential negative environmental impacts, mitigation measures and monitoring indicators. The ESMP is incorporated in the final SPR.

## **1.7 Public Consultation**

The consultant organized and convened consultation meetings with key stakeholders in the project area of influence. Covid-19 containment guidelines were strictly adhered to, wearing mask, frequent hand washing and sanitizing, and maintaining social distance of 1.5 meters. The consultancy team used the local administration leaders (e.g., local chiefs and their assistants and village elders) to reach the communities. Fourteen respondents were consulted during field visits. During these forums, the consultant in close consultation with the client shared the project information in terms of its implementation, predicted impacts, and received the stakeholders concerns as well. The social baseline survey provides several indicators to be observed as the project is being implemented.

## **1.8 Procedure for Social Baseline**

The social baseline survey was a descriptive cross-sectional longitudinal study, which

was convenient and purposefully administered. It was longitudinal because it looked at the socio-economic issues within Mwea-East presently while also forecasting on the future issues' influence/impact of the project on them and also providing recommendation on how to mitigate the foreseen negative issue that might arise due to the project's implementation process and outcome. The survey also used both qualitative and quantitative techniques of data collection methods. Questionnaires were both structured and unstructured to provide information that is more detailed; they were administered through interviewers to the 14 beneficiaries. This was done after debriefing of the beneficiaries the essence of the SPR development meeting so as the beneficiaries can understand the questions and provide accurate information. The beneficiaries in attendance were given questionnaires to fill and then the interviewers collected them. The sociologist collected 14 questionnaires, these questionnaires were later cleaned and all of them were found adequate and correctly filled. The quantitative analysis was done using the SPSS software using the thematic areas data coding, entry and cleaning was done. A univalent and bivalent analysis done plus multistage analysis to do comparison of one variable to the other (DeCoster & Claypool, 2004).

### **1.9 Content of the Summary Project Report**

The SPR was prepared by approved and registered NEMA Lead Expert who is familiar with the provisions of the Environmental Management and Coordination Act (EMCA), 1991 and other relevant regulations and laws of Kenya as indicated in the Legal frame.

The SPR has been organized into the following main Chapters:

1. Chapter 1: Introduction
2. Chapter 2: Nature of the proposed project
3. Chapter 3: Location of the proposed project
4. Chapter 4: Public participation and consultations
5. Chapter 5: Anticipated environmental and social impacts and mitigation measures
6. Chapter 6: Environmental and Social Management and Monitoring Plan (ESMMP)
7. Chapter 7: Conclusion and recommendations
8. References
9. Appendices

## 2 POLICY AND REGULATORY FRAMEWORK

### 2.1 Relevant National Policy Frameworks

Table 1: Relevant National Policies to TAAT II Activities

S/No	Policy	Scope	Applicability in TAAT II
1	<b>National Environmental Policy, 2013</b>	The policy promotes the use of environmental assessment tools, such as Environmental and Social Impact Assessment and Environmental Audits that are necessary to ensure long-term environmental quality and resource productivity for projects with the potential to cause negative impacts to the environment. The Policy also requires all sub-projects with the potential for significant environmental and social impacts undergo ESMP.	Presently, after E&S screening only Aquaculture of all compacts is doing an Environmental and Social Audit (ESA) all the others have done simple ESMPs.
2	<b>National Occupational Safety and Health Policy, 2012</b>	The main objective of this policy is to establish national occupational safety and health systems and programmes geared towards the improvement of work environment. The Policy seeks to reduce the number of work-related accidents and diseases, and to provide compensation and rehabilitation to those who may be injured at work or contract occupational diseases. The specific objectives of this policy among others are: To guide the development of laws, regulations and any other instruments on occupational safety and health; To recommend establishment and strengthening of responsible and accountable institutions for management of occupational safety and health; To recommend an enforcement and compliance mechanisms for occupational safety and health laws and regulations; To create mechanisms for cooperation between employers, workers and their representatives at workplaces in the promotion of occupational safety and health; To strengthen capacities of state and non-state actors in occupational safety and health; and To create a resource mobilization mechanism for the implementation of this Policy. Among other safety issues, the policy	Because TAAT II will have compacts whose activities will require land preparation, application of pesticides, and others may require simple construction works; this policy is applicable.

<b>S/No</b>	<b>Policy</b>	<b>Scope</b>	<b>Applicability in TAAT II</b>
		provides the framework for mandatory use of appropriate personal protective gear, protection of workers against of occupational hazards, and workplace provisions for First Aid and emergency medical evacuation.	
<b>3</b>	<b>National Land Use Policy (NLUP) 2012</b>	The National Land Use Policy guides Kenya towards an environmentally and socially responsible use of land and land-based resources for the socio-economic transformation of the people of Kenya. Its mission is to promote the best land use practices for optimal utilization of the land resource in a productive, efficient, equitable and sustainable manner. The principal objective of the NLUP is to provide legal, administrative, institutional and technological framework for optimal utilization and productivity of land and land related resources in a sustainable and desirable manner at National, County and Sub-County and other local levels. Project beneficiaries should utilize farms and land resources in a sustainable manner in accordance with Chapter Five of the Constitution of Kenya. The Constitution, under Article 60, requires that land is used in a manner that is equitable, efficient, productive, and sustainable. In addition, Articles 66, 68 and 69 provide for regulation of land uses, sustainable exploitation, utilization, management and conservation of the environment and natural resources.	Activities of TAAT II though they will be mainly in research centres; this policy will be applicable to the extent that land use for demos and trials is a must. Therefore, resource use efficiency shall be a requirement.
<b>4</b>	<b>National Water Policy 2012</b>	The National Water Policy of Kenya was developed in 1999 as the National Policy on Water Resources Management and Development (NPWRMD, 1999), and was subsequently amended in 2012. The policy aims to achieve sustainable development and management of the water sector by providing a framework in which the desired targets/goals are set. It outlines the necessary measures to guide the entire range of actions and	As TAAT II activities come on board in the National Agricultural Extension Systems (NARES) and other CGIAR centres, caution on the water footprints of the

<b>S/No</b>	<b>Policy</b>	<b>Scope</b>	<b>Applicability in TAAT II</b>
		<p>synchronize all water-related activities and sectors.</p> <p>The policy sets out the following specific policy objectives covering the four basic areas of water resources management, water supply and sewerage development, institutional arrangement, and financing of the water sector: (a Preserve, conserve and protect all available water resources and allocate it in a sustainable, rational and economical way; (b Supply of water of good quality and in sufficient quantities to meet the various water needs including poverty alleviation, while ensuring safe disposal of wastewater and environmental protection; (c Establish an efficient and effective institutional framework to achieve a systematic development and management of water sector; and (d Develop a sound and sustainable financing system for effective water resources management, water supply and sanitation development.</p>	<p>specific compacts would be necessary because Kenya is a water deficit country.</p>
<b>5</b>	<b>National Food and Nutrition Security Policy (NFSP), 2017</b>	<p>The policy aims to meet the nutritional needs of all Kenyans through provision of a sufficient supply of food and safe water. The broad objectives of the NFSP are: (i To achieve adequate nutrition for optimum health of all Kenyans; (ii To increase the quantity and quality of food available, accessible and affordable to all Kenyans at all times; and (iii To protect vulnerable populations using innovative and cost-effective safety nets linked to long-term development.</p>	<p>After implementation of TAAT II, it is anticipated that beneficiaries' productivity will increase, and in turn help the government achieve its target of increasing the quality and quantity of food available.</p>
<b>6</b>	<b>National Social Protection Policy, 2011</b>	<p>The Kenya National Social Protection Policy is a newly adopted policy (as Sessional Paper Number 2 of 2014). It has the goal of ensuring that all Kenyans attain social and economic development as provided in Article 43 of the Constitution. The policy provides the framework for social assistance,</p>	<p>The development objective (PDO) of TAAT is to "rapidly expand access of smallholder farmers,</p>

<b>S/No</b>	<b>Policy</b>	<b>Scope</b>	<b>Applicability in TAAT II</b>
		<p>social security, and health insurance. The Policy document acknowledges poverty as a hindrance to social development and observes that subsistence economies in areas with declining soil productivity and large households are likely to compete for various land uses. Social protection policy issues include safety nets and consumption transfers to sustain livelihoods and build human capital, and protection of assets and their rehabilitation to re-establish livelihoods. DRSLP II is one of the projects that incorporates an element of social protection through modernization of agriculture and promoting a shift from subsistence farming to commercialized production and creation of livelihood resilience.</p>	<p>majority women, to high yielding agricultural technologies to improve their food production, assure food security and raise rural incomes. And therefore, TAAT PDO is in tandem with this policy.</p>
7	<b>The National Livestock Policy, 2019</b>	<p>The Policy is consistent with current government strategies including the Vision 2030 and its Medium-Term Plans (MTP's), the Big Four Agenda and the sector wide agricultural sector development strategies that have been developed to enable the achievement of national development objectives as well as the Constitution of Kenya, 2010. This policy addresses the challenges in the livestock sub-sector in the context of livestock breeding, nutrition and feeding, disease control, value addition and marketing, and research and extension. This Policy recognizes the potential of the ASALs in livestock production and proposes options for the economic exploitation of these areas. The Policy takes cognizance of the contribution of the livestock value chain including non-conventional livestock species to the country's Gross Domestic Product.</p>	<p>The nine (9) value chain Compacts are rice, maize, cassava, wheat, sorghum &amp; millet, orange-flesh sweet potato, high-iron beans, small ruminants &amp; poultry and aquaculture, and Fall Army Worm (FAW). Thus, the presence of small livestock in TAAT is indicative that this policy is applicable.</p>

## 2.2 Relevant Legal and Regulatory framework

Table 2: Relevant Legal and Regulatory framework

<b>S/No.</b>	<b>Legal/Regulatory Framework</b>	<b>Scope</b>	<b>Application</b>
1	<b>Constitution of Kenya, 2010</b>	The Constitution of Kenya is the supreme law of the Republic of Kenya that binds all persons and all State organs at all levels of government. The Constitution was promulgated on 27 September 2010 into Law. The Constitution of Kenya 2010 provides the broad framework regulating all existence and development aspects of interest to the people of Kenya, and along which all national and sectorial legislative documents are drawn. In relation to environment, Article 42 of Chapter 4, the Bill of Rights, confers to every person the right to a clean and healthy environment, which 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.	TAAT II Compact activities have impacts described as localized/site specific, easily mitigated, reversible, and cost-effective in terms of environmental and social impacts are concerned. And therefore, the legal framework is applicable.
2	<b>Environmental Management and Coordination Act (EMCA), 1999 (Amended 2015) and further legal notices Nos 30 and 31 of April 30, 2019</b>	The Environmental Management and Co-ordination Act (EMCA) Cap 487 is an Act of parliament to provide for the establishment of an appropriate legal and institutional framework for the management of the environment and for related matters. The main	The ESMPs prepared under the TAAT II after screening are governed by this legal framework.



<b>S/No.</b>	<b>Legal/Regulatory Framework</b>	<b>Scope</b>	<b>Application</b>
		<p>objective of the Act is to:</p> <ul style="list-style-type: none"> <li>• Provide guidelines for the establishment of an appropriate legal and institutional framework for the management of environment in Kenya;</li> <li>• Provide a framework legislation for over 77 statutes in Kenya that contain environmental provisions;</li> <li>• Provide guidelines for environmental impact assessment, environmental audit and monitoring, environmental quality standards and environmental protection orders.</li> </ul> <p>The Act empowers the National Environment Management Authority (NEMA) to exercise general supervision and co-ordination over all matters relating to the environment, and to be the principal instrument of government in the implementation of all policies related to the environment. The <i>Second Schedule</i> to the <i>Act</i> specifies the projects for which an EIA or environmental audit must be carried out. According to the Act, Section 58, all projects listed in the Second Schedule of the Act must submit a study report to NEMA. EMCA and the other national laws that govern environmental, health and safety issues, in relation to agricultural and civil activities, are discussed briefly in the ensuing sections. Wherever any of</p>	

<b>S/No.</b>	<b>Legal/Regulatory Framework</b>	<b>Scope</b>	<b>Application</b>
		these laws contradict each other, this Act shall prevail.	
3	<b>Environmental Management and Coordinating (Water Quality) Regulation 2006</b>	<p>The Regulations provides for sustainable management of water resources including prevention of water pollution and protection of water sources (lakes, rivers, streams,' springs, wells and other water sources). It is an offence, under Regulation No.4 (2), for any person to throw or cause to flow into or near a water resource any liquid, solid or gaseous substance or deposit any such substance in or near it, as to cause pollution. Additionally, Regulation No. 11 makes it an offence for any person to discharge or apply any poison, toxic, noxious or obstructing matter, radioactive waste or other pollutants or permit the dumping or discharge of such matter into the aquatic environment unless such discharge, poison, toxic, noxious or obstructing matter, radioactive waste or pollutant complies with the standards for effluent discharge into the environment. Regulation No. 14 (1) requires every licensed person generating and discharging effluent into the environment to carry out daily effluent discharge quality and quantity monitoring and to submit quarterly records of such monitoring to the Authority or its designated representatives.</p> <p>The regulations require that project beneficiaries use environmental conservation options in catchment areas to</p>	Perhaps, where TAAT II Compacts may require small scale irrigation...this legal framework will be applicable.

<b>S/No.</b>	<b>Legal/Regulatory Framework</b>	<b>Scope</b>	<b>Application</b>
		prevent the migration of surface run-off (that might be contaminated by agrochemicals) from crop fields to open water.	
4	<b>Environmental Management and Co-ordination (Waste Management) Regulations, 2006</b>	The regulations provide detailed requirements for the management (handling, storage, transportation, treatment, and disposal) of various waste streams including domestic waste, construction and demolition waste, hazardous and toxic waste, and pesticides and toxic substances. Regulation No.4 (1) makes it an offence for any person to dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle. Regulation 5 (1) provides categories of cleaner production methods that should be adopted by waste generators to minimize the amount of waste generated.	Potential waste from project activities includes packaging materials for agrochemicals (which may be hazardous), and construction waste resulting from the construction of the small works i.e. storage facilities.
5	<b>Environmental (Impact Assessment and Auditing) (Amended) Regulations, 2019</b>	Environmental Impact Assessment under the act is guided by the Environmental (Impact Assessment and Auditing) (amendment) Regulations, 2019, which is given under legal notice no. 32. The regulations stipulate the ways in which environment impact assessment and audits should be conducted. The project is subject to the second schedule of EMCA, 1999 section 58 (1), (4) that require an Environmental Impact study. As stipulated by the legal notice No. 32, 2019,	One of the TAAT II Compacts – Aquaculture formulated an ESA as a mitigation measure guided by the screening and this legal framework.

<b>S/No.</b>	<b>Legal/Regulatory Framework</b>	<b>Scope</b>	<b>Application</b>
		<p>Section 7 (1) <i>Every proponent undertaking a project specified in the second schedule of the Act as being low risk project, shall submit to the Authority a summary project report of the likely environment effects of the project or Section 7(3) (a) Where the Authority considers that the proposed project may have a significant adverse environmental impact, it shall recommend that the proponent should prepare and submit a comprehensive project report or Section 7(3) (b) where the Authority consider that the proposed project is not likely to have any significant adverse environmental impact, it shall exempt the proponent from submitting a comprehensive project report and issues the proponent with the approval to proceed with the project</i></p>	
6	<p><b>Agriculture Fisheries and Food Authority Act, 2013</b></p>	<p>Agriculture, Fisheries and Food Authority Act (No.13, 2013) is an Act of Parliament to provide for the consolidation of the laws on the regulation and promotion of agriculture generally, and for the establishment of Agriculture, Fisheries and Food Authority. The Act tends to protect agriculture and fisheries excluding livestock for the purpose of national food security.</p> <p>The Act provides for the following activities:</p> <ul style="list-style-type: none"> <li>• Administration of crops and fisheries in accordance with</li> </ul>	<p>The Research centres for TAAT II should adhere to sector-specific requirements during breeding, trials, testing, validation, production, processing and marketing to ensure the quality of their compacts.</p>

<b>S/No.</b>	<b>Legal/Regulatory Framework</b>	<b>Scope</b>	<b>Application</b>
		<p>provisions of this Act.</p> <ul style="list-style-type: none"> <li>• Promotion of best practices and regulate, the production, processing, and marketing of agricultural and aquatic products.</li> <li>• Collection and collation of data and maintenance of a database on agricultural and aquatic products.</li> </ul> <p>Determining research priorities in agriculture and aquaculture.</p>	
7	<b>Livestock Act, 2020</b>	<p>AN ACT of Parliament to provide for the promotion, development, regulation and capacity building of the livestock sector; the establishment of livestock agencies and for connected purposes. The objective of this Act is to —</p> <ol style="list-style-type: none"> <li>a) consolidate the laws relating to livestock and livestock products;</li> <li>b) harmonize and strengthen the laws relating to livestock development;</li> <li>c) enhance the promotion and development of livestock industry;</li> <li>d) provide for coordinated development of the livestock sector to achieve the realization of the national food and nutrition security, and food safety;</li> <li>e) provide for the establishment and coordination of the public livestock agencies;</li> </ol>	TAAT II may have the small livestock, and therefore, this legal framework is applicable.

<b>S/No.</b>	<b>Legal/Regulatory Framework</b>	<b>Scope</b>	<b>Application</b>
		<p>f) facilitate regulation of livestock industry;</p> <p>g) enhance research for livestock production and development; and</p> <p>h) facilitate the review, development and strengthening of the livestock strategies and policies relating to livestock development.</p>	
8	<b>Seeds and Plant Varieties Act, 2012</b>	An Act of Parliament to confer power to regulate transactions in seeds, including provisions for: testing and certification of seeds; establishment of an index of names of plant varieties; empowering the imposition of restriction on the introduction of new varieties; control of the importation of seeds; authorizing measures to prevent injurious cross-pollination; providing for the grant of proprietary rights to persons breeding or discovering new varieties; establishing a Tribunal to hear appeals and other proceedings; and connected purposes.	The research centres will be on varietal breeding, trials and demos; and so the framework is applicable.
9	<b>Public Health Act (Cap 242), 2012</b>	The Public Health Act provides for: the protection of human health through prevention and guarding against introduction of infectious diseases into Kenya from outside; the promotion of public health; the prevention, limitation or suppression of infectious, communicable or preventable diseases within Kenya; advising and directing local authorities in regard to	By providing for guidelines on water quality, this Act provides a useful tool for regulating the activities of scientists within the research centres under TAAT II.

<b>S/No.</b>	<b>Legal/Regulatory Framework</b>	<b>Scope</b>	<b>Application</b>
		<p>matters affecting the public health to promote or carry out research; and conducting investigations in connection with the prevention or treatment of human diseases. This Act provides the impetus for a healthy environment, and supports regulations related to waste management, pollution, and human health.</p>	
10	<b>Climate Change Act, 2016</b>	<p>The mandate for this Act, gazetted in June 2016, resides with the Ministry of Environment and Natural Resources. The Act aims at creating a regulatory framework for enhanced Climate Action responses measures, and to provide a mechanism for low carbon climate resilient development. The Climate Change Act has five sections namely i) Climate change policy coordination and oversight, which establishes the National Climate Change Council to oversight all Climate change matters in Kenya ii) responses measures and actions, articulating specific Climate actions to be undertaken, such as ensuring mainstreaming Climate change matters into policies, plans and programmes iii) Climate Change duties and responsibilities, that assign specific duties to institutions to follow with respect to Climate Change, for example NEMA is given specific roles of monitoring Compliance with the Act in the area of greenhouse gas emission; (iv)</p>	<p>The TAAT II project should implement climate smart agriculture to limit emissions from agriculture and livestock practices that are a significant contributor to global GHG emissions. The researchers, by extension should adopt technologies, innovations, methods and practices that comply to adaptation to climate change.</p>

<b>S/No.</b>	<b>Legal/Regulatory Framework</b>	<b>Scope</b>	<b>Application</b>
		and Public participation, and financial provisions and miscellaneous.	
11	<b>Pest Control Products Act, 2012</b>	This Act (Cap. 346, 2012) requires that all chemicals used in any agricultural undertaking are registered by the Pest Control Products Board (PCPB). All pest control products sold in Kenya must bear a label showing a PCPB registration number. Under this Act, there are several pesticides whose use is banned in Kenya. The Act stipulates further that training in the use of pesticides must be carried out by PCPB accredited institutions and persons. All pesticide storage and handling arrangements must be inspected and licensed under the Act.	In accordance with these requirements, the TAAT II project should carry out training and sensitization of all beneficiaries in the use of permitted agricultural pesticides and biopesticides.
12	<b>Occupational Safety and Health Act, 2007</b>	This is an Act of Parliament to provide for the safety, health and welfare of all workers and all persons lawfully present at workplaces, and the establishment of the Directorate of Occupational Safety and Health Services and its purposes. It applies to all workplaces where any person is at work, whether temporarily or permanently.	Workers working around ponds should receive training in appropriate health and safety protocols including daily toolbox talks at the start of every work day. Appropriate PPEs shall be provided to all workers.
13	<b>Public Participation Act, 2018</b>	The Public Participation Act: provides a general framework for effective public participation; and gives effect to the constitutional principles of democracy and participation of the people under Articles 1(2), 10(2), 35, 69(1)(d), 118, 174(c) and (d),	The beneficiaries and all stakeholders shall be involved through a continuous consultation process throughout the



<b>S/No.</b>	<b>Legal/Regulatory Framework</b>	<b>Scope</b>	<b>Application</b>
		<p>184(1)(c), 196,201(a) and 232(1)(d) of the Constitution. According to the Act, the conduct of public participation shall be guided by the following principles -</p> <ul style="list-style-type: none"> <li>a. Principles. that the public, communities and organisations to be affected by a decision shall have a right to be consulted and involved in the decision-making process.</li> <li>b. provision of effective mechanisms for the involvement of the public, communities and organizations that would be affected by or be interested in a decision; participants' equitable access to the information they need to participate in a meaningful manner;</li> <li>c. that public views shall be taken into consideration in decision making; development of appropriate feedback mechanisms; and</li> <li>d. Promotion of sustainable decisions recognising the needs and interests of all participants, including decision makers.</li> </ul>	<p>project implementation in each compact.</p>
14	<b>Employment Act, 2019</b>	<p>The Act defines the fundamental rights of employees; provides basic conditions of employment of employees; regulates employment of children; and provides for matters connected with the foregoing. The Act includes provisions related to: prohibition against forced and or child Labor, discrimination in employment, sexual harassment, signed contract for Laborers,</p>	<p>The TAAT II project may develop or use a section under this Act to manage the casual labor force in any of the Compacts.</p>

<b>S/No.</b>	<b>Legal/Regulatory Framework</b>	<b>Scope</b>	<b>Application</b>
		employees' rights, duties', wages and salaries due and protection of children.	
15	<b>Labor Relations Act, 2007</b>	The Labor Relations Act consolidates the law relating to trade unions and trade disputes; provides for the registration, regulation, management and democratisation of trade unions and employers organisations or federations; and promotes sound Labor relations through the protection and promotion of freedom of association, the encouragement of effective collective bargaining and promotion of orderly and expeditious dispute settlement, conducive to social justice and economic development.	This Act protects the civil works workers and applicators pesticides.
16	<b>Work Injury Benefits Act, 2007</b>	The Act provides for compensation of employees for work-related injuries and diseases contracted during their employment and for connected purposes. Section 28, specifically, stipulates that an employee who suffers temporary total disablement due to an accident that incapacitates the employee for three days or longer is entitled to receive a periodical payment equivalent to the employees' earnings, subject to the minimum and maximum amounts fixed by the Minister from time to time, after consultation with the Council. Compensation for temporary partial disablement shall consist of a proportionate amount of the periodical payment calculated as specified earlier line.	workers at farm level especially those working on the ponds are subject to this legislation, and are entitled to compensation, access to medical aid, and insurance cover in the event of work-related injuries and ailments.

### 2.3 Relevant Environmental Institutions

Table 3: Relevant Environmental Institutions

<i>S/No.</i>	<i>Institution</i>	<i>Mandate</i>	<i>Applicability</i>
1	<b>National Environment Management Authority</b>	The responsibility of the National Environmental Management Authority (NEMA) is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment. In addition to NEMA, the Act provides for the establishment and enforcement of environmental quality standards to be set by a technical committee of NEMA known as the Standards and Enforcement Review Committee (SERC) which governs the discharge limits to the environment by the proposed project.	As the activities in TAAT II are all in agriculture impacting on natural resources; the NEMA will be an institution to walk along with.

### 2.4 Institutions with Mandate on Social Issues

The constitution provides for several institutions to address issues of vulnerable and marginalized groups including grievance and conflict handling mechanisms as provided for in this project E&S as well as in the project Implementation plans.

Table 4: Institutions with Mandate on Social Issues

<i>S/No.</i>	<i>Institution</i>	<i>Mandate</i>	<i>Applicability</i>
1	<b>National Gender Equality Commission</b>	National Gender Equality Commission is a constitutional Commission established by an Act of Parliament in August 2011, as a successor commission to the Kenya National Human Rights and Equality Commission pursuant to Article 59 of the Constitution. NGENC derives its mandate from Articles 27, 43, and Chapter Fifteen of the Constitution; and	Due to ENABLE TAAT Youth, this institution may be applicable.

		<p>section 8 of NGECA Act (Cap. 15) of 2011, with the objectives of promoting gender equality and freedom from discrimination. The overarching goal for NGECA is to contribute to the reduction of gender inequalities and the discrimination against all; women, men, persons with disabilities, the youth, children, the elderly, minorities and marginalized communities. The Agency has specific mandates including ensuring that those considered marginalized benefit from the project interventions.</p>	
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## 2.5 Conventions and Treaties

### 2.5.1 The African Convention on the Conservation of Nature and Natural Resources, 1968

Under the Convention, the contracting States undertake to adopt the measures necessary to ensure conservation, utilization, and development of soil, water, flora, and faunal resources in accordance with scientific principles and with due regard to the people's best interests.

### 2.5.2 RAMSAR Convention

The Convention was signed in 1971, and it provides a framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Contracting parties to the Convention agree to manage all their wetlands based on the concept of "wise use."

### 2.5.3 UN Convention to Combat Desertification (UNCCD)

The Convention was adopted in 1994 and is the sole legally binding international agreement linking environment and development to sustainable land management. It aims to improve the living conditions of vulnerable populations living in arid, semi-arid and dry sub-humid areas.

### 2.5.4 Convention on Biological Diversity (CBD)

The Convention promotes sustainable development that considers biodiversity. It dramatically defines steps towards conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of benefits arising from the use of genetic resources. This seeks to decrease the rate of loss of natural habitats, establish conservation areas, restore degraded areas and protect environments susceptible to human impacts.

### 2.5.5 UN Framework Convention on Climate Change (UNFCCC)

UNFCCC seeks to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. It recognizes the need to limit human action contributing to climate change and to come up with solutions to curb the negative results of climate change.

### 2.5.6 Stockholm Convention

The Stockholm Convention was entered into force in 1994 and aims to protect human health and the environment from persistent organic pollutants, that is, chemicals that remain intact/persist in the environment for a long period, known as Persistent Organic Pollutants.

### 2.5.7 AfDB Integrated Safeguards Framework

Table 5: African Development Bank Policies Relevant to Compacts

POLICY CODE	NAME OF POLICY	TRIGGERED (YES/NO)	WHY IS IT TRIGGERED?
<b>Operational Safeguards (OS1)</b>	Environmental and Social Assessment	Yes	OS1 is triggered as part of the mandatory ESAP process requiring screening of all project/program interventions. TAAT interventions will be based on the deployment of agriculture technologies leading to expansion and intensification of agriculture production across selected countries. These activities may pose environmental and social risks that can be readily managed with the application of mitigation measures elaborated in this ESMF and other safeguard instruments prepared during implementation.
<b>Operational Safeguards (OS2)</b>	Involuntary Resettlement: Land Acquisition, Population Displacement and Compensation	No	No case of land acquisition is expected during this project since interventions are all in research centres where institutional land will be used and subsequently dissemination of technologies will focus on only existing agriculture farmers and value chain actors. Similarly, no loss of assets or restrictions of access to assets, or loss of income sources are applicable to the TAAT program. OS2; is therefore not

			triggered.
<b>Operational Safeguards (OS3)</b>	Biodiversity and Ecosystems Services	Yes	Operational Safeguards 3 is triggered because TAAT involves the deployment of a wide range of agricultural technologies that will exploit natural resources and may affect biodiversity and ecosystem services including aquaculture, livestock production, among others.
<b>Operational Safeguards (OS4)</b>	Pollution Prevention and Control, Hazardous Materials and Resources Efficiency	Yes	OS 4 is triggered since the planned agricultural technologies will involve the use of improved application of fertilizers and agro-chemicals, as well as result in the production of agriculture wastes.
<b>Operational Safeguards (OS5)</b>	Labor Conditions, Health, and Safety	Yes	This is triggered because there is some form of labor even if not permanent. There is temporary labor when preparing land and also permanent employees at KARLO and Sagana

### 3 NATURE OF THE PROJECT

#### 3.1 Introduction

This chapter presents the Program's orientations and briefly describes the various Program components. The overall Program development objective of TAAT is to execute a bold plan to achieve rapid agricultural transformation across Africa through raising agricultural productivity in selected Priority Intervention Areas (PIAs) targeting specific agricultural commodity value chains. The PIAs include:

- achieving Self-sufficiency in Inland Fish Production.
- cassava Intensification.
- expanding Horticulture- This includes Vegetables, Sweet Potato, Banana/Plantain and Beans.
- Food Security in the Sahel – The priority **value** chains include Pearl Millet, Sorghum.
- Groundnut, Cowpea, Beef, Small Ruminant Meat and Poultry.
- increasing Africa's Wheat Production; and
- revitalizing Tree Plantations - This includes Oil Palm, Cashew, Coffee, and Cocoa.
- self-sufficiency in Rice Production.
- transforming African Savannas into Breadbaskets- This PIA will focus on Maize, Soybean, Poultry, Yam, Dairy (TAAT | IITA, n.d.).

#### 3.2 Program components

TAAT will support centrally managed activities and promote key technologies in selected countries. The overall TAAT activities is proposed in 35 countries and 23 Commodity value chains albeit in three tiers<sup>1</sup> and include Program management and coordination, Program services (including policy support, capacity development and outreach, youth in agribusiness support and the services of the Clearinghouse), and core implementation activities of the agricultural commodity value chains.

The Program will demonstrate the applicability of proven technologies in each PIA/value chains to engender and catalyze downstream investments from the private and public sectors as well as development partners. It will be implemented through the following components:

The following are the components of the program;

##### 3.2.1 **Component one:** Creation of an enabling environment for technology adoption by farmers via a seed system, technology release and registration policies that are regionally harmonized

Under this TAAT will review national and regional policies on variety release, registration, and the seed system with an aim of harmonizing them to fast track the release of technologies across similar agro-ecological zones. IITA and the other CGIAR implementing centres and their relevant National Agricultural Research and Extension Systems (NARES) will work using a participatory approach to: (i) disseminate proven agricultural technologies and innovations that significantly increase productivity, production and competitiveness; (ii) value chain development, and (iii) ensure inclusivity. This component will facilitate the dissemination of proven technologies and innovations to farmer organizations, youth agripreneurs and other

value chain actors. The activities will include (i) deployment of technologies (planting materials, etc.) following well-defined recommendations domains and pathways, (ii) training on use of technologies and good agricultural practices (GAPs), and (iii) linking farmers to input and output markets, facilitate access to credit and insurance service by farmer organizations to reduce production and price fluctuation risks.

The proposed technologies were screened and selected by the AfDB and independent experts based on their proven advantages and capacity to address specific constraints along the value chains. Examples of selected technologies include improved crop/livestock varieties resistant to multiple stressors including climate change, integrated soil fertility management (ISFM), integrated pest management (IPM), biological nitrogen fixation (BNF), nutrient use efficiency (NUE), and land use efficiency (LUE) technologies among others. Under this component, that is where, most of the interventions targeted in Malawi are being implemented.

### **3.2.2 Component two: A Regional Technology Delivery Infrastructure (RTDI) or TAAT platform that is able to provide and deploy needed food production technologies and any additional adaptive research required.**

Under this, RTDI will develop a menu of food production technologies and work with RMCs, as represented by NARES and the private sector, to develop a proposal to take these technologies to scale.

### **3.2.3 Component three: Deployment of appropriate food production technologies, through crop/livestock campaigns in RMCs.**

TAAT will engage CGIAR/RTDI and other technology providers to develop a menu of proven food production technologies, namely: seed system or artificial insemination guidelines (technical manuals) for large scale deployment of improved varieties/breeds, disease control, improved crop/animal production methods, aquaculture, etc. RMCs, as represented by NARES, will prepare a proposed food technology outreach campaign covering one or more of the menu items, with support from the respective CTDC for submission to the Clearinghouse of the RTDI. The proposals will clearly state the target beneficiaries, location, development impact, and timelines within the RMCs. The Clearinghouse will review the proposals according to a set of agreed criteria and recommendations for funding. Oversight will also be provided for implementation by the Clearing house.

### **3.2.4 Component four: Project management**

This will mainly involve day to day management of the project.

## **3.3 Institutional and implementation arrangement**

IITA shall be the Executing agency for the TAAT Program. In this capacity, IITA will sign Memorandum of Understanding (MoUs) and implementation agreements with each of the Lead Centers/institutions for the various initiatives within the Program. IITA will act through a Program Management Unit (PMU) composed of staff competitively recruited with the responsibility to manage the whole Program and report to the AfDB.

The CGIAR Centers responsible for activities within each commodity value chains will act through Project Implementation Units (PIUs) composed of relatively few competitively recruited staff. Each of the lead institutions shall in turn also establish sub-contract agreements with respective collaborating institutions within the initiative groups or set of agricultural commodity value chains. Each contract shall clearly state the expected deliverable, timelines, and associated costs. The Kenya Agriculture and Livestock Research Organization (KALRO) Headquarters, and the KALRO



participating Centres: Katumani, Njoro, and NARL will be responsible for overseeing the activities through its researchers while the National Aquaculture Research Development and Training Centre (NARDTC), Sagana with support from the Headquarters will implement aquaculture and related compacts i.e., ENABLE TAAT Youths.

National partners will be responsible for technology campaigns within their own countries but are expected to work closely with farmer organizations, youth groups, schools, and the private sector. The national partner in Kenya are: International Institute of Tropical Agriculture (IITA), AATF, Syngenta for Fall Armyworm, Cereal Growers Association, Seed Merchants, Millers Association, Cargill, for the grain compacts, International Center for Agricultural Research in the Dry Areas (ICARDA), CIMMYT, World Fish, and Fish feed manufacturers, Aquacultural Association of Kenya, and International Potato Center (CIP), amongst others.

At the country level, the C-House team will develop and deploy mechanisms for reaching millions of farmers and other stakeholders with the proven technologies and technological packages, working with the available and most active national institutions and the ACVC leaders.

At regional levels, there will be a Coordinator based in one of the PIUs within the region. S/he will be responsible for coordinating the implementation of the project activities involving all the ACVCs, and interfacing with relevant Regional Economic Communities (RECs) and the C-House team.

### **3.4 TAAT principles and approach**

TAAT will operate along the following guidelines:

- a. It will mobilize only proven agricultural technologies related to the selected key agricultural commodity value chains.
- b. Its activities are directed toward large-scale technology dissemination. It will conduct investigations relating to site-specific adaptation of these technologies, but not engage in other field research or pilot studies.
- c. TAAT is an open membership platform, especially with regard to independent technology providers and those seeking to commercialize proven technologies and innovations. The leaders of each PIA are expected to operate in an integrated and complementary manner and allocate Program resources accordingly.
- d. TAAT will assist AfDB's RMCs and their respective ministries as they respond to the Bank's call for agricultural transformation in Africa. While the TAAT has identified potential countries for a given agricultural commodity value chain within each PIA, country participation ultimately depends on each RMC's buy-in based on their own priorities.
- e. Private sector participation is crucial to the success of TAAT and include production input manufacturers, input distributors and distribution networks, commodity buyers and exporters, and new and existing agro-processors.

The Clearinghouse is intended to identify and advance proven agricultural technologies and innovations for consideration by RMCs in the development of their

agricultural loan projects. Working with RMCs, the Clearinghouse will formulate and test these buy-in strategies and monitor and communicate their performance.

## 4 THE LOCATION OF THE PROJECT

### 4.1 Introduction

The following Chapter details on environmental, socio-economic, and biophysical characteristics of the proposed project area. It is expected that it will provide for a benchmark for continued monitoring and assessment of the impact of the proposed project on the environment and social life.

### 4.2 Proposed site location

Its name comes from Kenya's longest river, Sagana River which is also called Thagana. Sagana Centre is located about 2 km within Sagana Township in Kirinyaga County, approximately 104 Km Northeast of Nairobi City (Figure 2). It lies at latitudes  $0^{\circ} 39' 41.64''\text{S}$  and  $37^{\circ} 11' 57.35''\text{E}$  and at an altitude of 1316 m above mean sea level. The Centre occupies an area of approximately 59.37 hectares with 109 operational ponds of which 72 (150m<sup>2</sup>) are research ponds, and the rest used for spawning, fingerling production and grow-out production. The farm is supplied with water from River Ragati by gravity all-year round (Figure 1) (*Map of Sagana - Search*, n.d.).

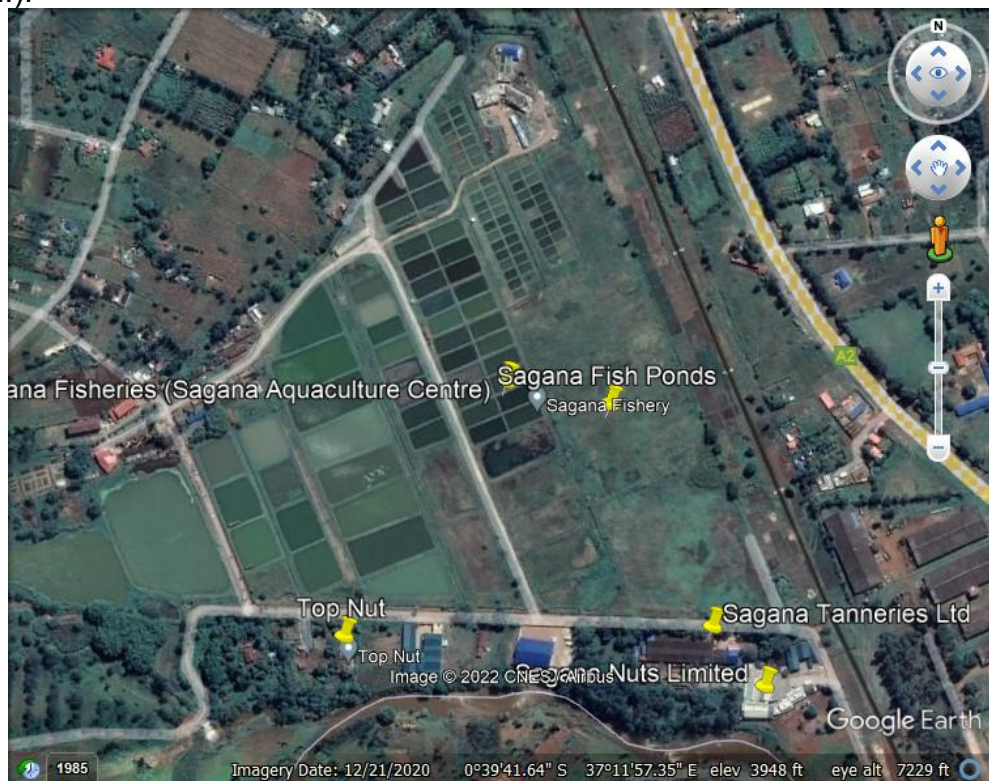


Figure 1: Location of the Sagana Fish Farm

### 4.3 NARDTC Sagana Fish Farm

The Sagana Centre was started by the colonial government in 1948 as Sagana Fish Culture Farm (SFCF) later changed to Sagana Aquaculture Centre (SAC) by the Kenyan government at independence. Since independence, the Farm has played a critical role in aquaculture development in Kenya. In 1993, rehabilitation of the farm was done, under the sponsorship of a project funded by the Belgian Government. Renovation of old ponds as well as construction of new ones took place through 1996. Farm operations were partly funded by the Government of Kenya. In 2009, Sagana Fish Farm was transformed to the National Aquaculture Research Development and Training Centre (NARDTC) to spearhead the implementation of the Fish Farming Enterprise Productivity Project under the Economic Stimulus Programme (ESP).

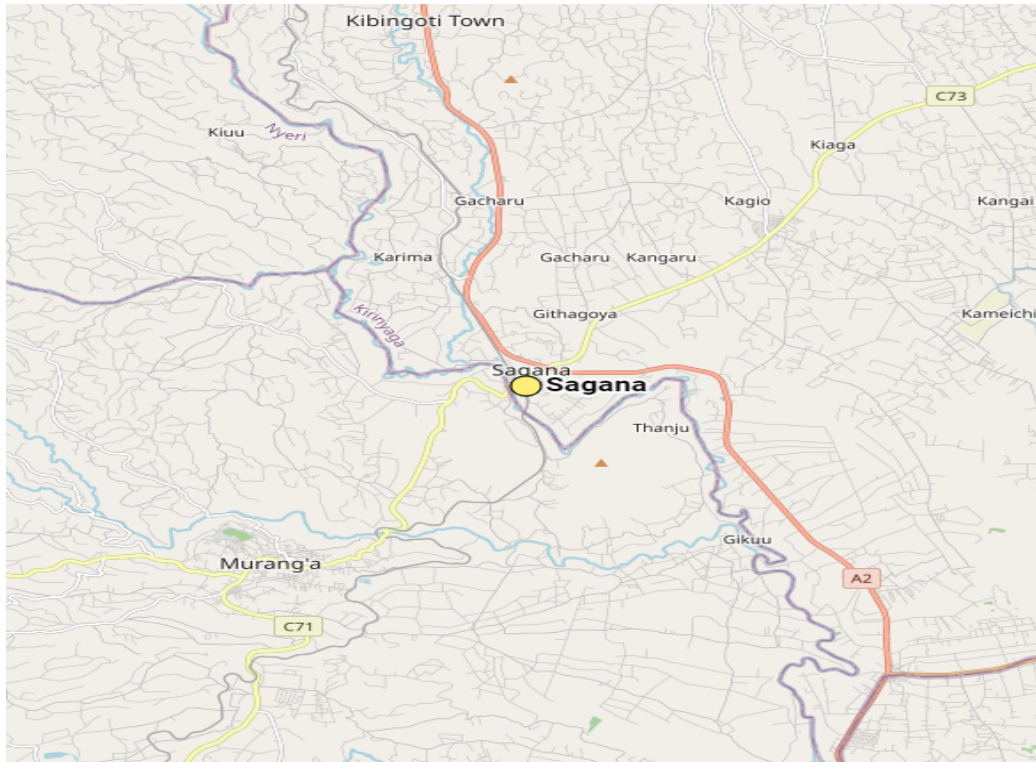


Figure 2: The Location of Sagana Town: Source: (Map of Sagana - Search, n.d.)

#### 4.4 Biophysical Features

The basin experiences bimodal rainfall pattern due to the inter-tropical convergence zone (ITCZ). The long rain season is from March to May while the short rain season is from September to December. The county has a tropical climate and an equatorial rainfall pattern. The climatic condition is influenced by the county position along the equator and its position on the windward side of Mt Kenya. The amount of rainfall declines from the high-altitude slopes of Mt. Kenya towards the semi-arid zones in the eastern part of Mwea and Sagana constituencies. The temperature ranges from a mean of 10<sup>0</sup> C in the upper zones in the night to 30<sup>0</sup>C in the lower zones during the hot season. Sagana is situated at the edge of a large plain at the southern foot of Mt. Kenya. Soils were formed on volcanic rocks from Mt. Kenya. The soils are of two **soil** types found at **Sagana**, Kenya, black clay **soil** (eutric Vertisol) and a red clay **soil** (chromic Cambisol) and have the capacity to retain nutrients from pond effluent. Some areas with black cotton soils indicate that the soils have formed under restricted drainage conditions, which are the result of low rainfall and the presence of level to moderate slopes

- **Flora**

The vegetation is mainly acacias interspersed with exotic tree plantations. The area is gentle sloping with thick layer of rich brown loamy soils. Water sources in the proposed project site include river water, borehole, and shallow wells and harvested water. During assessment, there was no sensitive/endangered flora and fauna at the proposed TAAT II site. No vegetation will be cleared to pave way for the establishment of the proposed TAAT II activities.

- **Fauna**

Wildlife animals are found mainly in the protected areas, forest, rivers, and farmlands. Monkeys are very common in farmlands and causes a lot of damage to crops. Animals around project site are mainly domestic animals such as cattle, sheep, goats, and poultry. There are no animals or resources of wildlife and tourism importance. There are a lot of birds in the county. There are few wild animals found in the rivers such as crocodile and hippopotamus. Different animal species are found in different inhabitants like such as trees, rocks, swamps, rivers, caves, and other microhabitats found in the region. These animals include mammals, birds, insects, reptiles, amphibians, and mollusks. During the assessment, there were no sensitive/endangered flora and fauna at the proposed project site.

#### **4.5 Socio-economic Characteristics**

The area is served by energy from KPC, though some residence has installed private solar panel and generator for power backup in case of power blackout. Most of the sanitation blocks are ablution blocks equipped with septic tank. From assessment, there were no ecosystems of historical/ecological/archeological importance that are threatened by the procurement and operation of the proposed aquaculture. The proposed project site blends well with the neighborhood. There were no adverse land-use activities such as waste disposal particularly solid and wastewater in close proximity to the proposed project site. Sagana township and its periurban activities point to a rich agricultural land. The community here is mainly on irrigated rice which is the main source of income not just to the households but to women. Its women who are hawking rice in town, and others have stores where they sell from. The land is also rich in fruits and vegetables with the main market in Nairobi. Sagana township has sprout from rice economy. The establishment of the proposed project will not affect any cultural heritages such as temples, pagodas and known graveyards.

#### **4.6 Demography**

Mwea East Sub - County has a population of approximately, 11,839 people (PHC, 2009), whose main economic activities are agriculture both crop and animal husbandry, both large and small-scale farming. They are also engaged in business, and some are employed. It also houses the famous Sagana river, which is the main water source in the region. It is a cosmopolitan area with a variety of Kenyan ethnic groups living there. Total beneficiaries of the proposed project is 4300. This includes the vulnerable beneficiaries who are; the poor of the poor, orphans, physically challenged, single mothers, women-led households, HIV/AIDs affected/infected all about 980.

## **5 PUBLIC CONSULTATION AND PARTICIPATION**

### **5.1 Introduction**

Stakeholder consultation is a must in African Development Bank supported projects for ownership. Community participation and consultation were undertaken among people living around Sagana Fish Farm and area of influence as an integral part of the ESMP study. These meetings enabled interested and affected parties to contribute their concerns (views and opinions on the proposed development) which might have been overlooked during the scoping exercise.

Members of the public are supposed to participate and get involved in decision-making concerning development projects because they affect them. Reference is made to Section 17 of the Environmental (Impact Assessment and Audit) Regulations, 2003, which states that the Proponent shall in consultation with the authority, seek the views of persons who may be affected by the projects. In addition, under the principles of public participation bill 2018 in provision of effective public participation. Public, communities, and organizations have a right to be consulted and be involved in the decision-making process. The role of public consultation and involvement in SPR process is to assure the quality, comprehensiveness and effectiveness of the assessment and ensure that the public views are adequately taken into consideration in decision-making process.

### **5.2 Objective of Public Participation**

This public participation was conducted to assure the quality, comprehensiveness and effectiveness of the assessment and ensure that the public views are adequately taken into consideration in decisionmaking process.

### **5.3 Methodology/Approaches**

Different methods were used for public participation so to try as much as possible to get all the positive and negative concerns from members of the public. The methods used include the following administering of questionnaires, interviews, Focus Group discussions, community meetings such as chiefs Baraza's, a formal meeting for the government departments responsible of public works and use of mails where necessary for clarification. Since the community participation were conducted during the Covid-19 pandemic period the participants were invited through short messages and all the Ministry of health guidelines on Covid-19 were adhered to such as wearing of masks, hand washing, use of hand sanitizers, maintaining of social distance of 1.5metres from person to person.

Meeting(s) with Regional KALRO Centres (Njoro and Katumani) and National Aquaculture Research Development and Training Centre (NARDTC), Sagana were comprehensively done. For the NARDTC, Sagana, various stakeholders were met in different dates. Some of the stakeholders who either assisted in or drew technological benefits from NARDTC were in different geographical regions (i.e ENABLE Emuhaya and Kibwezi Youth Groups (Table 7: List of NARDTC, Sagana Stakeholders).

Each of the stakeholders were given a chance to air their views. These comments, observations and fears were captured and integrated into this final report as E&S Challenges (Table 6: Stakeholder Comments).

The main stakeholders who were consulted were those directly involved in the implementation of the Program and the environmental and social screening.

They are:

- ❖ County representatives of the Ministry of Agriculture, Livestock, Fisheries, and Cooperatives (MoALF&C);
- ❖ Researchers responsible for the implementation of TAAT II demo and trial farms in the field.
- ❖ Those responsible for implementing the TAAT program in Kenya.

These stakeholders were consulted through individual interviews and focus group discussions) (Appendices 1-3 minutes). These consultations also made it possible to collect more detailed information on: the presentation of the areas concerned by the Program; the environmental and social issues related to the different components of the Program, and the shortcomings observed in the implementation of TAAT 1.

*Table 6: Stakeholder Comments*

Comments, observations, and Fears by Stakeholders (face-to-face meetings) – various dates	Responses
a) Release of funds for compact activities has been irregular	Noted. It will be communicated. In TAAT II this will be addressed.
b) The TAAT/IITA compacts are acting as silos, they are not coordinated to talk to each other.	Will be communicated in the design of the project
c) Project funding does not cover all activities in aquaculture breeding i.e., funds cover demos and trials but not release of breeds. This is the gap that must be supported for the breeds/fingerlings to reach farmers out there.	This is being addressed in TAAT II
d) Aquaculture breeders were not taken through OS of the AfDB before commencement of the compact activities.	Will be included in the budget. To be addressed in TAAT II.
e) PPEs in aquaculture – even when PPEs were in the design of the project; the issue was never taught nor supported.	Will be adhered to in TAATA II.

<p>f) Compact implementers have not been brought together in a workshop to share information and ideas. They need to be capacity build directly.</p> <p>g) Besides implementation, compacts need regular supervision. This is not currently happening.</p> <p>h) NARDTC requires more open days in order for the surrounding farmers to come and learn. Can this be supported?</p>	<p>It for the Centre, to budget all activities under outreach in TAAT II.</p>
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Table 7: List of NARDTC, Sagana Stakeholders

No.	Name of stakeholder	Position	Station/Compact	Contact	Date of Interview
1	Nashon Joel	Member	West Kenya Youth Group-ENABLE -TAAT (Emuhaya)		December 09, 2021
2	Getrine Melisa	Committee member	"		December 09, 2021
3	Dan Khasakhala	member	"		December 09, 2021
4	Amianda Alex	Member	"		December 09, 2021
5	Floice Okwisa	Member	"		December 09, 2021
6	Rebecca Minayo	Member	"		December 09, 2021
7	Omuka Moses	Member	"		December 09, 2021
8	Patience Muhonja	Member	"		December 09, 2021
9	Timothy Kote	Member	"		December 09, 2021
10	Ms. Lorraine Mutinda	ENABLE Emuhaya Youth Group –	TAAT/IITA Youth Coordinator, KASARANI	Phone +254 705873395 Email: <a href="mailto:L.Mutinda@cgiar.org">L.Mutinda@cgiar.org</a>	December 09, 2021



11	William Ogak	Aquaculture Trainer	NARDTC, Sagana	Phone +254 721 839 648	December 02, 17, 2021 and April 05, 2022
12	Mr. Munyiri	Aquaculture Trainer	NARDTC, Sagana		April 05, 2022
13	Tom Ojuok	CD, NARDTC, Sagana	NARDTC, Sagana	Phone: +254 729 384 851	April 05, 2022
14	Elizabeth Muema	Liaison Officer, ENABLE TAAT Compact; Team Leader Kibwezi Entrepreneurs Youth Group (KEYG)	Kibwezi, ENABLE TAAT	+254 707 859 015 email: <a href="mailto:E.muema@cgiar.org">E.muema@cgiar.org</a>	December 16, 2021

#### 5.4 Community and future Stakeholder Engagement

The project is located in a government and in area far away from communities living nearby. However, there will be time to time community participation and stakeholder engagement throughout the project cycle to ensure that the community and stakeholders are kept informed during implementation and during operational phase of the project.

#### 5.5 Project Support

From the consultations, it was evident that the project is fully supported by the concerned stakeholders. The project management should embrace the spirit of engagement throughout the implementation and operation periods. This will provide an opportunity for addressing arising matters/ issues while at the same time ensuring sustainability of the project.

## **6 IDENTIFICATION OF ENVIRONMENTAL AND SOCIAL IMPACTS OF THE SITE**

### **6.1 Introduction**

Assessment of impacts depends on the nature and magnitude of the activities being undertaken, as well as the type of environmental control measures that are envisaged as part of the project proposal. The impacts that are expected to arise from a project could either be termed as positive or negative, direct, or indirect, short-term or long-term, temporary or permanent depending on their nature, area of coverage and their duration in the environment. Impacts have been identified and discussed in all phases of the proposed project. These are drilling and construction, operational and decommissioning. Most impact and mitigation measures have already been proactively addressed in the project design and public participation. The impacts were determined based on ground-truthing observations, stakeholder engagements, professional judgment, technical realities based on the project design and socio-economic baseline.

### **6.2 Positive Impacts during all phases of the project Implementation**

#### **6.2.1 Positive Environmental Impacts**

- **Fish Protein more efficient to produce than other farmed proteins**

When looking from an energy efficiency point of view, and thus carbon emissions point of view, producing protein from aquaculture is much more efficient than many other forms of protein production.

#### **6.2.2 Positive Social Impacts**

- i. Stimulation of skills transfer: Due to the nature of operations, the proponent will have to implement a training programme for all staff. Training programs will be advanced, and staff will permanently benefit from these training programs. Many of the training programs will target specifically semi-skilled local workers.
- ii. Stimulation of economic development (e.g. supply of materials and goods project maintenance new businesses, employment, housing, better markets and access to public services)
- iii. Sustained supply of fish feeds will ensure that prices are stabilized in the local market and in any case, consumers may benefit in the long term from reduced fish prices
- iv. Job creation: new jobs will be created. It is estimated that new jobs will ensure livelihood for people (young and old) in the local area.
- v. Aquaculture is also an industry that is highly accommodating of female labor.
- vi. Increased fish suppliers. With the establishment of the aquaponics besides other aquaculture systems, more farmers will be encouraged to rear fish due to the ready source of fingerlings to the market hence directly increasing the local income base.
- vii. More competitive conditions that could lower costs of consumer goods; readily available market
- viii. Creation of new long-term employment opportunities outside the plant facility: selling fish
- ix. General enhancement of the health conditions and quality of life in the project area. With better prices comes better income to beneficiaries of the aquaponics project.
- x. Improved food security in Kenya
- xi. Provision of high protein food source for local populations.

#### **6.2.3 Anticipated Negative Impacts**

### **6.2.3.1 Negative Environmental Impacts**

- **Wastes and Pollution**

Wastes including empty container wastes, lab wastes in form of glass and cotton will form the main sources of pollutant. Potential sources of pollution may include:

- a) Improper disposal from the site of liquid and solid wastes.
- b) Glass waste from lab products; and
- c) Pieces of waste papers among other materials.

All personnel working on the project will be trained prior to starting operations. Specific training should be focused on solid and liquid wastes management.

#### **Mitigation Measures**

- a) Workers on pesticides/chemical application to be trained on safe use of pesticides.
- b) Formulate and train on the site waste management plan (WMP).
- c) Any form of glassy waste maybe ground as walling finishing material.
- d) Make a refuse pit where all papers may be collected to and burnt frequently.

- **Occupational health safety (OHS)**

All projects always present an element of danger because human beings are involved. Operating workers are likely to encounter accidental injuries including poisoning from the chemicals applied for sexing of fingerlings and dropping in the open fishponds. Such injuries can also result from accidental injuries from hand tools among others. It is therefore, recommended that the occupational health and safety of the workforce will have to be monitored by the respective site sections. Safety procedures need to be followed including use of personal protective equipment (PPE) provided and their use enforced for risks of accidents and incidents can be substantially reduced.

#### **Mitigation Measures**

- Put labels and warning signs on areas and surfaces posing risk of injury or accidents
- Provide all workers with full protective gear (PPEs)
- Train and provide First-aid Kit to the workers
- Establish and maintain Incident and Accident Registers on site for recording of injuries or any OHS incidence
- Prepare a contingency / emergency management and preparedness plan.
- Ensure availability of Emergency contacts for police, ambulance, gender-based violence (GBV) referrals, etc.
- Communicate Emergency plans repeatedly and in a manner easily understood.
- Train workers on administering first aid.
- At least perimeter fence each pond with a net.

- **Nutrient Build-up**

Open water aquaculture as is in NARDTC results in nutrient build-up. Nutrients build up in the environment surrounding the fish because there is nothing to prevent dead fish, food that isn't eaten and feces entering the water column. These additional nutrients cause algal blooms as the tiny plants make use of all the additional nutrients. Additionally, having a large number of fish kept closely together in a small pond area means that any diseases or parasites are likely to spread much more quickly.

#### **Mitigation Measures**

- Drain fishponds more frequently at least every six months.
- Keep optimal fish populations per metre square based on fish species i.e. catfish because of their cannibalism nature require more space and in addition exclusively from other species.
- Sample the water for testing of the nutrient levels and build-up frequently, and at entry and exit points in case of draining system..
- Release waste water into a marshy land with water reeds to help in purification of the water before it is released into the main river.
- Use of antibiotics should be sparingly to avoid other complications downstream.

- **Fish Predators**

Pond aquaculture is prone to bird predators. These reduce the fish populations and of course profitability.

#### **Mitigation Measures**

- Employ guards to scare such birds from the ponds.
- In case of small water surfaces, use nets to cover the surface.

- **Acidification of soils**

If ponds are abandoned, unless treated crop use may be a challenge. Soils may to degraded and salty.

#### **Mitigation Measures**

- Rehabilitate such ponds by planting some water plants to stabilize the salty levels.
- Undertake soil sampling before and after rehabilitation to ascertain suitability of such lands for other usage.

- **Pollution of drinking water**

From Ragati River, the water is redirected to River Tana. There is therefore a risk of water contamination when fish ponds are drained regularly.

#### **Mitigation Measure**

- Treat the water before discharging into the main water body.
- Frequent water sampling to be done at the entry of the marshy area and after the marshy area to ensure the water is clean for domestic use.

- **Introduction of Invasive Species**

River Ragati, feeds into the Sagana Fish Farm ponds. Unless caution is taken while draining and replenishing ponds with water; invasive species may be introduced that may interfere with the current genetic pool or even introduce pests and diseases.

#### **Mitigation Measure**

- Assign senior technicians to man the draining of fishponds and replenishing of water.
- At the entry canal from Ragati River, put a net to serve away any invasive species.

#### **6.2.4 Negative Social Impacts**

- **Social-Health Risk – Spread of COVID-19 amongst workers**

The World Health Organization declared COVID-19 a global pandemic after assessing both its alarming levels of spread and severity, and the alarming levels of inaction. During project operationalization, new workers will be required who be coming from various places in the country which are COVID-19 hot spots; and interaction of workers with the project host community will happen as workers find accommodation close to work site, and/or return to their homes after work. The potential for the spread of any infectious disease like COVID-19 by projects is high.

The Government of Kenya has also lifted some of the initial movement controls and allowed the resumption of business, with certain industry specific guidelines being enforced. The duty of care has now been transferred to individual citizens and enterprises. Recognizing the potential risk this may present, it is difficult to clearly outline exhaustive mitigation measures under the mitigation impacts. As such, there is need for the client and the workers to develop and adopt COVID-19 Standard Operating Procedure (SOPs) in line with the African Development Bank (AfDB) protocol, Ministry of Health Directives, and site-specific project conditions. These SOPs need to be communicated to all workers and enforced to the latter without fail. In addition to the requirement of the SOPs, the following mitigation measures shall also be adopted:

#### **Mitigation Measures**

- The proponent will develop SOPs for managing the spread of Covid-19 during project execution and submit them for the approval by the County Department of health. The SOPs shall be in line with the African Development Bank protocol on COVID-19, Ministry of Health guidelines and site-specific project conditions;
- Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including workers and visitors;
- Avoid concentration of more than 15 workers at one location / site. Where there are two or more people gathered, maintain social distancing of at least 1.5 meters.
- All workers and visitors accessing project area every day or attending meetings shall be subjected to rapid Covid-19 screening which may include temperature check and other vital ;
- The project shall put in place means to support rapid testing of suspected workers for covid-19;
- Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites.
- Ensure routine sanitization of shared social facilities and other communal places routinely

- **Risk of increased spread of COVID-19**

During project execution, large numbers of workers will be required to assemble together at work places, in meetings. The suppliers of material and services are also expected to come in from various places in the country, which may be COVID-19 hot spots. The interaction of workers with the project host community will happen as workers return to their homes after works. The potential for the spread of any infectious disease like COVID-19 by projects is high. There is also the risk that the project may experience large numbers of its workforce becoming ill and will need to consider how they will receive treatment, and whether this will impact on local healthcare services including the project host community.

**Mitigation**

- a) The Proponent will put in place measures to prevent and manage the spread of the COVID-19.
- b) Provide relevant PPE especially face masks for all project personnel and ensure that they use them appropriately.
- c) The project shall put in place means to support rapid testing of suspected workers for COVID-19.
- d) Avoid concentrating more than 15 persons or workers at one location. Where more than one person is gathered, maintain social distancing at least 1.5 meters. All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid COVID-19 screening which may include temperature check-ups and other vital signs.
- e) Install handwashing facilities with adequate running water and soap or sanitizing facilities at entrance to work sites.
- f) Ensure routine sanitization of shared social facilities and other communal places routinely

## **7 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN**

### **7.1 Introduction**

The environmental and social management and monitoring plans (ESMMP) for the proposed project provide all the details of project activities, impacts, mitigation measures, time schedules, costs, responsibilities, and commitments proposed to minimize environmental impacts of activities, including, monitoring and evaluation and environmental audits during implementation, and decommissioning phases of the project. The formulated monitoring plan will ensure environmental and social mitigation measures contained in the Environmental and Social Management Plan (ESMP) are implemented. The ESMP and detailed specific plans will constitute part of guidelines and will be embedded for holistic project management. Monitoring checklists will be prepared to ensure that set standards, targets, monitorable indicators, and verifiable indicators are met. The Table below summarizes the ESMMP.

Table 8: Environmental and Social Management Plan

<i>No</i>	<i>Impact (Environmental/Social)</i>	<i>scope of impact</i>	<i>identified impact</i>	<i>Mitigation measure(s)</i>	<i>Frequency</i>	<i>Responsible person</i>	<i>Proposed cost of mitigation (USD)</i>
1	Liquid waste disposal	local	-Pollution of soil and water. -River water contamination from aquaculture activities;	-For a hatchery and any other activity generating wastewater; develop a waste management plan -Construct effluent management system at the proposed fish handling sites.	6 months	-Sagana fish farm Research Officer	
2	Decreased Water Quality	downstream users	-Pollution from Aquaculture activities.	-dispose of Aquaculture water on hydroponic crops but ensure water runoff is minimized.	quarterly	-Sagana Researcher / -County Director of NEMA	



<i>No</i>	<i>Impact (Environmental/Social)</i>	<i>scope of impact</i>	<i>identified impact</i>	<i>Mitigation measure(s)</i>	<i>Frequency</i>	<i>Responsible person</i>	<i>Proposed cost of mitigation (USD)</i>
				- if the Aquaculture are installed near natural water ways, then let NEMA monitor water quality.			
3	Soil erosion	local	-Land surrounding -Siltation of waterways; and nearby water reservoirs	-Minimize removal of vegetation and grass surrounding the greenhouses . -Minimize earthworks and displacement of soil in the green house. -Monitor areas of exposed soil during periods of	annually	-Sagana fish farm Research Officer	

<i>No</i>	<i>Impact (Environmental/Social)</i>	<i>scope of impact</i>	<i>identified impact</i>	<i>Mitigation measure(s)</i>	<i>Frequency</i>	<i>Responsible person</i>	<i>Proposed cost of mitigation (USD)</i>
				heavy rainfall. -Erosion control and restoration plan - waste management plan			
4	Accidents around ponds	local	-Impacts on human health and public safety. - accidents as a result of handling the system.	-procure Personal Protective Equipment (PPE). - The Project will require all supervisors to implement an Environmental, Health and Safety (EHS) plan which will outline procedures for avoiding health and safety	always	Sagana Researcher	

<i>No</i>	<i>Impact (Environmental/Social)</i>	<i>scope of impact</i>	<i>identified impact</i>	<i>Mitigation measure(s)</i>	<i>Frequency</i>	<i>Responsible person</i>	<i>Proposed cost of mitigation (USD)</i>
				<p>incidents and for emergency. - This will be achieved by making it a component of contractual agreement. -workers will be required to wear suitable Personal Protective Equipment (PPE) including hard hats, high-visibility vests, safety boots and gloves and life vests as appropriate in accordance with the EHS plan.</p>			

<i>No</i>	<i>Impact (Environmental/Social)</i>	<i>scope of impact</i>	<i>identified impact</i>	<i>Mitigation measure(s)</i>	<i>Frequency</i>	<i>Responsible person</i>	<i>Proposed cost of mitigation (USD)</i>
				-Enforce use of PPEs at all times for all staff and laborers and ensure supervision of the same to minimize accidents.			

Table 9: Environmental and Social Monitoring Plan

No	Impact (Environmental/Social)	scope of impact	identified impact	Mitigation measure(s)	Verifiable indicators	Responsible person	Monitoring frequency	Means of verification	Proposed cost of mitigation (USD)
1	Liquid waste disposal	local	<ul style="list-style-type: none"> <li>- Pollution of soil and water.</li> <li>-River water contamination from aquaculture activities ;</li> </ul>	<ul style="list-style-type: none"> <li>-For a hatchery and any other activity generating wastewater; develop a waste management plan</li> <li>- Construct effluent management</li> </ul>	<ul style="list-style-type: none"> <li>-Waste management plan.</li> <li>-effluent system done</li> </ul>	<ul style="list-style-type: none"> <li>- Sagan a fish farm Research Officer</li> </ul>	Quarterly	Reports	

<i>No</i>	<i>Impact (Environmental/Social)</i>	<i>scope of impact</i>	<i>identified impact</i>	<i>Mitigation measure(s)</i>	<i>Verifiable indicators</i>	<i>Responsible person</i>	<i>Monitoring frequency</i>	<i>Means of verification</i>	<i>Proposed cost of mitigation (USD)</i>
				system at the proposed fish handling sites.					
2	Decreased Water Quality	downstream users	-Pollution from Aquaculture activities.	-dispose of Aquaculture water on hydroponic crops but ensure water runoff is minimized. - if the Aquaculture are installed	-water conservation measures laid down. -install water quality monitoring devices on strategic points	- County Director of NEMA	Quarterly	-reports. -Email to NEMA. -Other means of correspondence.	

No	Impact (Environmental/Social)	scope of impact	identified impact	Mitigation measure(s)	Verifiable indicators	Responsible person	Monitoring frequency	Means of verification	Proposed cost of mitigation (USD)
				near natural water ways, then let NEMA monitor water quality.					
3	Soil erosion	local	-Land surro-Siltation of waterways; and nearby water reservoirs	- Minimize removal of vegetation and grass - surrounding the greenhouses. - Minimize	- prepare site specific ESMP. -adopt zero tillage in the green houses.	- Sagan a fish farm Research Officer	Annually	Reports, minutes of meetings, visitors' book to show M&E activities	

<i>No</i>	<i>Impact (Environmental/Social)</i>	<i>scope of impact</i>	<i>identified impact</i>	<i>Mitigation measure(s)</i>	<i>Verifiable indicators</i>	<i>Responsible person</i>	<i>Monitoring frequency</i>	<i>Means of verification</i>	<i>Proposed cost of mitigation (USD)</i>
				<p>           e            earthworks and displacement of soil in the greenhouse.            -Monitor areas of exposed soil during periods of heavy rainfall.            -Erosion control and restoration plan            - waste manage         </p>					



<i>No</i>	<i>Impact (Environmental/Social)</i>	<i>scope of impact</i>	<i>identified impact</i>	<i>Mitigation measure(s)</i>	<i>Verifiable indicators</i>	<i>Responsible person</i>	<i>Monitoring frequency</i>	<i>Means of verification</i>	<i>Proposed cost of mitigation (USD)</i>
				ment plan					
4	Accidents around ponds	local	-Impacts on human health and public safety. - accidents as a result of handling the system.	-procure Personal Protective Equipment (PPE). - The Project will require all beneficiaries to implement an Environmental, Health and Safety (EHS)	No of participants who put on PPEs while in the project. -Existence First Aid Kits with participants. -Presence of Accident/Incident Register	Sagan a Researcher	Always	-Presence of PPEs. -existence of first aid kits. -no of accident cases reported.	

<i>No</i>	<i>Impact (Environmental/Social)</i>	<i>scope of impact</i>	<i>identified impact</i>	<i>Mitigation measure(s)</i>	<i>Verifiable indicators</i>	<i>Responsible person</i>	<i>Monitoring frequency</i>	<i>Means of verification</i>	<i>Proposed cost of mitigation (USD)</i>
				<p>plan which will outline procedures for avoiding health and safety incidents and for emergency.</p> <p>-Enforce use of PPEs at all times for all staff and laborers and ensure supervision of the</p>					

<i>No</i>	<i>Impact (Environmental/Social)</i>	<i>scope of impact</i>	<i>identified impact</i>	<i>Mitigation measure(s)</i>	<i>Verifiable indicators</i>	<i>Responsible person</i>	<i>Monitoring frequency</i>	<i>Means of verification</i>	<i>Proposed cost of mitigation (USD)</i>
				same to minimize accidents					

## 7.2 ESMP Disclosures

Openness and transparency are key principles of the AfDB policy. 'Openness' reflects the Bank willingness and availability to engage with stakeholders, and the provision of effective platforms and instruments for such engagement. This Aquaculture ESMP will not only be disclosed in-country but also in the AfDB website.

## 7.3 Cost Estimates for ESMP Implementation

The costing for ESMP implementation is twofold-one for implementing the mitigation measures and the other for the independent M&E activity.

## 7.4 Implementation Schedule

**Table 10: Activity Implementation Schedule**

Activity	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
capacity building												
support Centre Demos												
Dissemination of technologies												

## **8. GRIEVANCE REDRESS MECHANISM**

### **8.1 Introduction**

The Grievance redress mechanism allows affected parties to submit grievances and seek redress for any matters that might be directly attributed to decisions of the project management or the implementation team.

A Grievance Redress Mechanism (GRM) is a system by which queries or clarifications about a project are responded to, problems that arise out of implementation are resolved and most importantly – for presentation and resolution of grievances including complaints. The project should have a grievance redress mechanism committee to oversee the receiving and handling complaints/grievances that may emerge during project implementation at both the community and project levels. In case the project grievance redress mechanism committee is unable to handle the grievance raised, they should escalate the grievances to the head office grievance team. All grievances received will be recorded and acknowledged and mechanism on how the grievance was handled reported and the resolution reached reported back to the complainant. This is to ensure public satisfaction on project deliverables.

### **8.2 AfDB Grievance Redress Mechanism Approach**

The following parties are eligible to submit grievances to the AfDB Grievance and Redress Mechanism if they can demonstrate that their rights or interests have been or are likely to be adversely affected by projects supported by the AfDB and decisions thereof on activities:

- (a) Two or more persons, such as AfDB activity participants, a community of persons, an organization, association, society or other grouping of individuals.
- (b) Qualified representative of the affected parties.
- (c) Representatives of the host country's national or county government or of other governments involved in an AfDB activity.
- (d) Other entities that can establish legitimate rights or interests.

### **8.3 GRM at project level**

The project affected persons (PAPs) or communities will raise their grievances about actual or perceived project impacts in order to find a satisfactory solution. This is an especially important aspect in a project because it enhances accountability and transparency. These grievances, influenced by their physical, situational (e.g., employment), and/or social losses, can surface at different stages of the project cycle. Some grievances registered during the project design and planning stage will be captured and may yet come up during project implementation. In order to ensure that such grievances are addressed, key stakeholders in the communities and county governments shall be consulted through an established Grievance Redress Committee (GRC) at project level - NARDTC, Sagana, Kenya.

### **8.4 Appointing members of Grievance Redress Committees (GRC)**

The Grievance Redress Committees, GRC, shall be mandated to deal with all types of grievances arising at the community and Centre levels due to the aquaculture project. This committee shall be constituted as soon as project funding is released to the Centre; and its members shall comprise qualified, experienced, and competent personnel who are able to interact and gain the trust of the local community and staff members. A representative from the small businesses located within the affected area; – A representative of a voluntary organization, NGOs; – A representative of the AfDB/Project; – A representative appointed by the Community head, Area Chief, A representative of the staff, etc.

### **8.5 Procedures, complaints channels and time frame for GRM**

All grievances should be sent to the PMU through the implementation structures' secretariat. A grievance shall contain the following information: (a) Name(s); (b) Title, function, address and other contact information; (c) Role in relation to the contested activity, including in relation to the eligibility criteria; (d) Grievance, containing a reference to the project or the contested decision, stating all the relevant facts, including the harm suffered by or threat to the affected parties and description of how the parties have been or are likely to be materially and adversely affected by the impact, activity act or omission, and what rights or interests of the parties were directly affected; when requesting a compliance review, an explanation of how the project activity's policies, procedures or contractual documents were violated; (e) An indication if there has been any previous communication between the affected parties and the project management; (f) Proposed resolution; Interim Adaptation Benefits Mechanism and Executive Committee; (g) Other information supporting the grievance, such as evidence, documents or visual materials, including relevant correspondence with the project management; (h) Signature(s).

### **8.6 The AfDB's Independent Review Mechanism (IRM)**

The IRM's mandate is to provide people adversely affected by a project financed by the African Development Bank (AfDB) with an independent mechanism through which they can request the AfDB to comply with its own policies and procedures. The IRM intervenes when people or communities affected submit a complaint. In this way, the IRM can be considered as a recourse instrument for project affected people who have previously been unable to resolve their problems with the AfDB's Management.

## 9 CONCLUSION AND RECOMMENDATIONS

### 9.1 Conclusion

In accordance with EMCA and the Environmental (Impact and Audit) Regulations (Amendment 2019), legal notice 31, the findings of the SPR carried out for this project indicate that possible minimal environmental impacts generated during operationalization of the proposed project are mainly reversible, site specific and cost-effective; and therefore, can be addressed effectively by the proponent through the mitigation measures indicated in the matrix above. As per the above analysis of the aspects of both positive and negative environmental impacts of the project's development, there are **NO SIGNIFICANT NEGATIVE IMPACTS** that could pose adverse effects to the extent of barring the proposed project from being implemented. However, the identified potential negative impacts of the proposed project could be managed with the suggested environmental and social management plan. Having considered the data collected, analyzed, and collated information that is available, it is the experts' considered opinion that:

- The project does not pose any serious environmental concerns, other than those of a minor scale that accompany most development activities.
- The positive impacts of the project outweigh the negative ones, which will be adequately contained by following the prescribed environmental and social impact management plans.
- As such, the project could be allowed to commence without being subjected to full ESMP (is a low-risk project) and activities be managed within the provided ESMP and sound environmental management practices that are internationally recognized.
- The study has been done in total compliance to not only national regulatory framework but also according to the AfDB ISS requirements and guidelines.

### 9.2 Recommendations

- (i) Ensure that worker's occupational health and safety standards are maintained through capacity building, proper training, providing protective clothing and equipment/kits.
- (ii) Annual environmental audits should be carried out on the project in order to ensure compliance of the project with the mitigation measures outlined in the Environmental Management and Monitoring Plan (ESMMP),
- (iii) Servicing of the equipment should be done as per the manufacturer specification.
- (iv) There is need for management and workers' awareness creation on the environmental and social management issues and sustainable project maintenance.

## REFERENCES

- DeCoster, J., & Claypool, H. (2004). Data analysis in SPSS. Retrieved May, 15, 2010. *Map of Sagana - Search*. (n.d.). Retrieved April 20, 2022, from <https://www.bing.com/search?q=Map+of+Sagana&cvid=e8b27b5ded204adfb01e990561ac602e&aqs=edge..69i57j69i64.10955j0j1&pglt=41&FORM=ANNTA1&PC=U531>
- Mcclanahan, T., Allison, E. H., & Cinner, J. E. (2015). Managing fisheries for human and food security. *Fish and Fisheries*, 16(1), 78–103. <https://doi.org/10.1111/faf.12045>
- Rahman, A., & Gamal Nairobi -Kenya, E. (n.d.). *Aquaculture in Kenya Status-Challenges-outlook*.
- TAAT | IITA. (n.d.). Retrieved December 28, 2021, from <https://dev.iita.org/tag/taat/>
- TAAT AQUACULTURE COMPACT – Taat-Africa. (n.d.). Retrieved January 29, 2022, from <https://taat-africa.org/aquaculture/>
- TAAT FAW Compact Archives | IITA. (n.d.). Retrieved December 28, 2021, from <https://www.iita.org/tag/taat-faw-compact/>



## APPENDICES

(Screening Checklist, Public participation evidences, design drawings, Site plan layouts and Land take documents among others)

Appendix 1: Minutes of Aquaculture meeting held in Sagana Fish Farm Centre

### **MINUTESS OF MEETING BETWEEN TAAT PROJECT COORDINATORS AND THE CONSULTANT COMMISSIONED BY TAAT ON ENVIRONMENTAL AND SOCIAL SCREENING ON TAAT COMPACT ACTIVITIES ON 2/12/2021 AT SAGANA FISH FARM**

#### INTRODUCTION

The meeting was started by giving a brief on the Compact impacts of the project. The project has a new Director who was not present.

The farm was introduced by the British government in the year 1948.

#### Types of fish grown

1. Warm water fish
2. Ornamental fish for beauty and fancy.

The aim of the farm was to rear warm water fish in a controlled environment for example fish ponds. Types of the fish reared on the farm are; Tilapia, Cat fish, Labeo, common Carp, Black bass.

The aim of rearing the Warm water fish was the provision of, self-employment, medicinal purposes and also for industrial purpose.

Ornamental fish are also grown on the farm are; Gold fish, Koi Carp, Yellow Comet, Black Moli.

#### **THE FARM**

The farm covers 146 acres of land and hosts 3 departments.

1. The Kenya Fishing School
2. National Agriculture Development Centre
3. Kenya Marine and Fisheries Research Institute

Fish farming is done through different culture systems namely;

1. Pond system - The farm has 150 fish ponds of different sizes.

Types of ponds; concrete ponds, liners ponds and earthen ponds.

2. Cage fish system
3. Hapa net fish culture. Done with a net system to hold small fish species.
4. Aquarium fish culture.
5. Hatchery – some fish do not reproduce under captivity e.g. Cat fish. Aquaponic technology. New technology of keeping fish without the soil under a green house.

#### **System supported by TAAT**

Only the aquaponics fish system is supported by TAAT. Its basis is innovation and technology transfer.

The project started in 2017 and is currently in phase 2, currently being done in 55 schools Country wide. The purpose is to reach out to a bigger community. This is an initiative from the government for youth development and to curb unemployment among the youth. The project emphasizes on secondary schools but now colleges are also coming in.

**How many staff members are trained on aquaponics technology?**

There are four staff members including the director, Eight (8) new staff under probation and one (1) skilled casual

**GENDER RATIO**

The first four are all men.

Recruits – 2 female, 6 male

**Do you get records of schools coming in the farm?**

Since there is also revenue collection, the farm is able to get records which also includes the sex of the people visiting the farm. Example on this day, there were male – 57, and female – 44.

Tallying is done by the end of every month to get average participation per month.

Formal requests are done by schools to visit the farm and also indicate what they want to see and learn.

**Rates**

The entry rates are:

College and famers – kshs 100.

High schools - kshs 50.

For practical's on artificial propagation the charges are kshs 1200/- per practical.

**Challenges**

1. Lack of technological know-how in the management of the technology.
2. Insecurity within the institutions. Cases of vandalism and theft.
3. For security, there are no mechanisms yet captured or set up for insurance.
4. There is still a gap in terms of occupational health and safety.
5. In terms of gender mainstreaming, the majority is still men while women are few.
6. Delay in funds disbursement which leads to under supply of things like feeds to schools.
7. They chose to do cat fish in all sites in schools. The challenge here is the source of the fingerlings for the cat fish.
8. Level of production for Cat Fish is high because reproduction has to be induced.
9. Raw materials for feeds are expensive hence production is still for subsistence.

**NB: Reason for choosing cat fish is because it is a hardy fish**

10. Delay in the procurement proses.

**Fingerling sources**

- Technology department

- Famers who have undergone authentication.

11. Covid – 19 also slowed things tremendously.

**Q. Is there a challenge in the transportation of the fingerlings?**

Transport is not an issue. Always presence of the driver, and two specialists, who alternate with different trips transporting the fingerlings.

The only issue is that, transport is a shared resource in the farm, hence some activities remain pending. The department has a driver but does not have its own vehicle hence share with other department.

12. Fish feeds:

Fish feeds are generally expensive. The profit margin of fish farming is still hard to calculate.

- Currently there are no policies to give an alternative for a cheap feed or even a government subsidy in buying the fish feeds in Kenya.

13. There is still a deficiency in the supply of fish in Kenya. Fish farming is open for willing farmers to rare fish in Kenya. So far project has farmers in: Bomet – 3, Nakuru – 1, Kajiado – 2, Narok – 1, Kakamega 2.

The aquaculture business development center currently is operating in; Kisii, Migori, Homabay,, Kajiado, Nyeri, Embu, Tharaka Nithi, Kirinyaga and Meru.

**Q. Does the project have a website?**

The project does not have its own website but ride on a website of one of the departments on the farm. They have a desk guy to oversee on the website.

**Q. Do you have a quality control system in the production and supply of fish and fish fingerlings?**

- Monitoring is done on a daily basis due to the presence of a lab in the farm.
- During drought, only a few ponds are used due to low levels of water.
- During rainy season, there is normally flooding. Flooding occurs when water at entry point is more than the spill way can accommodate. River Ragati is the main source of water while the outlet oof excess and waste water is directed in to River Tana.
- Regulation of water in the ponds is constant.
- Harvest is done regularly and at times complete harvest and removal of all fish in the ponds.

**PROJECT UNDER TAAT**

The project that is supported by TAAT in the farm is the one for AQUAPONICS.

The aim of the project support is to empower the youth on food security since they don't own land. This is also in line with the **Eat More Fish Campaign**, which has not been done since the outbreak of Covid-19 in Kenya.

**SCHOOLS SELECTION CRETARIA**

The selection is normally done through an M.O.U between the school and the project. In order to qualify

The school must have:

- i. Water should be available.
- ii. Land to establish the pond.
- iii. Management structure should be present
- iv. Security.

The Sagana center stands with the Governments economic stimulus through FAO, ABDP, EFAD.

The first phase supports 10 schools.

9 boys school and 1 girls school.it also supports 2 children's home in Narok and Embu.

The project phases out after first harvest which is normally 6 months, but continues support for 1 year.

In the project, Moi girls Vokoli is considered as the projects model school. Their harvest and proceeds are the highest. Alliance is harvesting for the fourth time now.

NB: The project can also give support to primary boarding schools and also community groups but in the pond culture system not Aquaponics.

### **MONITORING AND EVALUATION**

Monitoring and evaluation is normally done and there is a monitoring platform that is active.

In this platform, all progress, incidents and accidents are reported.

**NB:** So far the only incidents reported are those of theft and vandalism. It was noted that this only occurred during the outbreak of Covid – 19 in the country.

All reports are shared with other departments and head office when they get in.

The reports get in once in every month.

The Government is also re-introducing the 4K Clubs so as the schools can embrace the project.

### **ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT, ENVIRONMENTAL IMPACT ASSESSMENT, AND ENVIRONMENTAL AUDITS.**

The aquaponics project does do impacts assessment and have reports with NEMA and also WARMA.

NB: In Aquaponics, cleaning is normally done to remove excess algae and the water is normally reused. Aquaponics system is the most cleanest in terms of fish farming.

### **OBSERVATION**

In the Sagana fish farm, some of the houses in the farm are roofed with asbestos.

### **RECOMMENDATIONS**

- I. There is need for more fish propagators due to shortage of fish fingerlings supply.
- II. Transport is a shared resource hence some activities remain pending due to lack of transport.
- III. Funding is inadequate for planned activities. NB: funds normally have a timeline.
- IV. Inadequate funds for more exposure and trainings thus more funds need to be allocated.

- V. Remove the asbestos roofs and replace appropriately with Corrugated Iron Sheets.
- VI. So far, only 3 have been trained. I.e. from the management of schools from 3 schools only. This is due to lack of funds.
- VII. Unga feeds are the only fish feed manufacturer. Sigma feeds were phased out due to poor quality feeds. The prices for raw materials need to be regulated in order to reduce the prices of fish feeds because so far fish feeds are expensive.
- VIII. In aquaponics, high value crops like; arrow roots, water melons and beetroots are recommended.