Strengthening Climate Resilience of Agricultural Livelihoods in Agro-Ecological Regions I and II in Zambia

Environmental and Social Management Plan

For the

Proposed Fish Breeding Facility under Sub Output Activity 2.4

Lwiimba Agricultural Camp, Chongwe

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1. INTRODUCTION

1.1 Scope of the Environmnetal and Social Managmnet Plan

This Environmental and Social Management Plan (ESMP) provides the framework and guidelines for management and mitigation of the site specific environmental and social impacts associated with "Fish Breeding Facility" under Sub output Number 2.4 "Introduce alternative livelihoods to strengthen resilience in target communities" , part of **Strengthening Climate Resilience of Agricultural Livelihoods in Agro-Ecological Regions I and II in Zambia**

The significance of implementing this Environmnetal and Social Mangmnet Plan arises from the need to take up measures, during the work implementation, to control and reduce the environmental and social impacts in accordance with legal requirements of the Government of Zambia, with the specific policies and Regulations and conditions stipulated in the UNDPS and GCFs Envronmnetal and Social Safeguards.

1.2 Environmental and Social Safeguards

The Fish Breeding activity will apply a complete set of UNDPS safeguards to protect against adverse impacts on the physical and social environments. All of the activities under this project sub activity from construction to operation phase works will be implemented in compliance with the UNDPS Environmental and Social Safeguards and the Zambian Environmental Laws.

1.3 Objectives of The Fish Breeding ESMP

This ESMP documents how the Environmental Management System is to be implemented during the works for the proposed fish breeding facility in Chongwe following the SCRAL project Environment and Social Management Framework https://undpgefpims.org/attachments/5858/215458/1704079/1716494/FP-UNDP-170118-5858-Annex%20VI_a_.pdf. Its main objective is to create conditions for effective environmental and social protection through the strict implementation and control of all the defined environmental and social impact mitigation measures, and to avoid negative environmental, social and gender impacts where possible.

The ESMP has the following objectives:

- Ensure compliance with applicable legal requirements.
- Avoid or minimize the environmental and social impacts resulting from the different work phases.
- Assign responsibilities to specific role players, by setting environmental management procedures.
- Promote the reduction and reuse of waste generated.
- Prevent environmental and social risks.

2. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

This Environmental and Social Management Plan (ESMP) -Table 1 represents actions to address and manage the potential negative and positive impacts associated with the proposed Fish Breeding project activity. It further, defines the standards and guidelines to be achieved in terms of environmental legislation, policy, and standards. The ESMP involves the protection, conservation and sustainable use of the various elements or components of the environment. The ESMP for the proposed project provides all the details of project activities, impacts, mitigation measures, time schedules, responsibilities and commitments proposed to minimize environmental impacts of activities, including, monitoring and evaluation and environmental audits during implementation phases of the project activity.

This ESMP also provides the framework for project activity monitoring and evaluation/audit. Mitigation measures provided in this section are aimed at making changes in any of the following ways: project materials, raw materials, project sites to mention but a few. The main objectives of this site specific ESMP are to:

- Ensure the project is compliant with applicable national environmental and social legal requirements.
- Identify the required mitigation measures that are needed in order to reduce negative impacts and enhance positive ones.
- Ensure that all mitigation measures and recommendations identified during the environmental impact assessment are incorporated into documents that are referenced and expanded if necessary, during the various phases of the project.
- Outline the mitigating/enhancing, monitoring, consultative and institutional measures required to prevent, minimize, mitigate, or compensate for adverse environmental and social impacts and/or to enhance project related beneficial impacts.
- Address human resource requirements to ensure implementation of the ESMP is possible.

To achieve the above, the ESMP will ensure that:

1. ***During project planning and design***, all mitigation measures identified are incorporated into the planning and design of the project are considered during the detailed planning and design phase.
2. ***During construction*** all constraints, restrictions and actions required to minimize construction related impacts are implemented.
3. ***During commissioning and operation***, detailed operating procedures are developed so that all constraints, restrictions, and actions required to minimize

impacts caused by commissioning and operation are developed, implemented, and monitored for all aspects of the project.

4. ***During the life of the project,*** continue to enhance positive impacts and ensure mitigation for negative impacts. An important component of this monitoring, evaluation and communication of findings, and adherence to the principle of continued improvement.

The ESMP is an umbrella plan that describes the management of environmental, health and safety (EH&S) matters and that will be complemented and augmented by a number of actions.

2.1 Summary of Main Identified Impacts

The fish breeding activity has both Positive and Negative environmental, social impacts. The main environmental risks and impacts likely to emanate from proposed fish breeding activity include.

Positive Impacts

- **Creation of Employment Opportunities and Income**: - Employment opportunities more especially for the youths will be created through the construction phase of the facility.
- **Meeting the High Demand for Fish**: - Fish has been on high demand because of the general dwindling supply of fish on the market.
- **Promoting aquaculture in the district**: - The Zambian Government has taken a deliberate policy to promote aquaculture fish farming in the country as an alternative source of livelihood for the country. Embarking on fish farming will contribute to government's effort in meeting this goal

Negative Impacts

- **Soil Erosion**. During construction, soil erosion will occur from clearing of vegetation and earthworks. Improper drainage of runoff from the project site can also cause erosion, and lead to sediment loading in the water course pathways
- **Air pollution.** air and dust emissions from construction equipment at the site. Dust emissions will also result from earthworks, particularly in the dry season
- **Wildlife and Wildlife Habitat loss** due to Noise, and vibration of Moving equipment will affect the birds and people within the construction sites. Wildlife and habitat loss can also be caused due to land clearing.

- **Water pollution,** the coming of the facility will increase the number of farmers to go into fish farming. However, famers close to water bodies will affect the water equality

of the district water bodies due to sediment loads in the water course which may temporarily increase as a result of construction debris and excavation works. During the rains, soil from the earthworks may be washed into rivers/streams, consequently reducing the water quality.

- **Construction waste** from equipment oils and fuels can affect soils and water bodies at the construction site
- **High rates of HIV / AIDS:-** Due to importation of labour, in most cases, these will place the locals of the opposite sex more specially the school children are at a high risk to indulge in sex, most times unprotected sex affecting the school pupils and the communities near-by.

2.2 Overall Impact Evaluation

The identified impacts were screened using the UNDP Social and Environmental Screening Procedure to assess the potential significance of the impacts thus-**negligible, low, medium, high, and extreme.**

The main conclusions of the analysis are the following:

- Most impacts for the fish breeding facility are rather “Low” to “Moderate” which can easily be mitigated
- There is no impact of the category "High and Extreme” or mitigation not possible", which would have to be considered as a no-go for the project activity .

Table 1: Environmental and Social Management Plan (ESMP)-Proposed Chongwe Fish Breeding Facility

Environmental Aspect/Issue	Action No.	Potential Environmental Impact	Positive/ Negative Impact	Mitigation / Enhancement Measures	Responsible
Site clearance.	1.	Loss of terrestrial remnant flora including rejuvenating species	Negative. **Low Risk**	Clearing of vegetation and trees will be strictly controlled. This can be limited to what is absolutely necessary, and therefore cannot be done indiscriminately. Keeping the construction width to a minimum will substantially reduce the amount of vegetation and the number of trees that need to be removed during construction.	Contractor
	2.	Soil erosion due to land clearing	Negative. **Moderate Risk**	Bare land will be restricted to that for fish breeding area and appropriate drainage will be constructed.	Contractor
				Earthworks will be controlled during construction so that land that is not required for construction is deviated. Wherever possible, earthworks will be carried out during the dry season to prevent soil from being washed away by the rain.	Contractor
				Proper management of excavation activities and organization of soil will be facilitated to allow for use of the soils to make dykes in between ponds.	Contractor
	3.	Loss of habitat for birds, ants, insects, etc.	Negative **Low Risk**	There area is already disturbed sitting on the school premises where they have gardening and the impact on species may not be significant. However, any way to preserve some species that may be found on site will be exercised.	Contractor

	4.	Emission of dust on exposed surface	Negative. **Moderate Risk**	Sprinkling of water will be done intermittently to keep dust generation to low levels to acceptable ZEMA limits	Contractor
	5.	Impact on landscape and visual character of the area	Positive	At construction stage, this may seem a negative impact, but once construction phase is reached, the area will improve aesthetically. The design has to fit in the exiting infrastructure on site	PMU
	6.	Loss of Vegetation	Negative **Moderate Risk**	Clearing by use of herbicides will be prohibited. The District will need to properly supervise the contractor in this regard.	Contractor
Operation of heavy equipment during Construction of fish breeding facility	7.	Improper handling of machinery can endanger the safety of employees	Negative. **Low Risk**	Inspection of machinery will be conducted whenever in use and workers trained on safety requirements	Contractor
	8.	The use of heavy equipment can compact and change the texture of the soil.	Negative. **Low Risk**	Equipment will be used only in places where this will be needed	Contractor
Generation of waste	9.	Unsound management practices of waste have the potential to impact on the aesthetic value of the site and pollute land and water resources	Negative **Moderate Risk**	Waste disposal vessels will be placed on site and sensitize any worker to dispose generated waste in the vessel, which will later be transported to the designated site both during construction and Operation phases.	Contractor, Fish Breeding management Unit
	10.	Waste management during operation phase	Negative **Low Risk**	During operations, the Fish breeding management unit will be encouraged to register with the solid waste transporter who will remove waste from the Fish breeding centre for proper disposal. Where possible agricultural waste will be recycled for use I the School Garden.	Fish Breeding Management Unit
	11.	Through surface run-off and wind erosion, suspended solids may cause local contamination of surface soils as well as flora	Negative. **Low Risk**	This may not a significant impact at the project site. Drains will be constructed to ensure surface run off is managed accordingly	Contractor

Generation of noise by Construction activities	12.	The construction activities to be conducted are bound to generate noise levels to unsettle the neighborhood and school pupils	Negative. **Moderate Risk**	Construction of fish breeding facility will not be done during the night but rather during the day between 6am and 6pm.	Contractor
			Negative **Moderate Risk**	Proper maintenance of construction equipment will be done consistently to help reduce noise levels within 85 db.	Contractors
Air Pollution	13.	Generation of dust during earthworks can cause air pollution at the site	Negative. **Moderate Risk**	Particulate Matter and Dust emissions during earthworks will be minimized by sprinkling the worked areas with water or other dust suppression strategies.	Contractor
			Negative. **Moderate Risk**	Proper maintenance of construction plant and equipment will be done to reduce emissions of noxious fumes (carbon dioxide, carbon monoxide, nitrogen oxides, Sulphur oxides), as well as mitigate noise levels.	Contractor
Water Quality	14.	Effluents from the Fish breeding Facility	Negative. **Moderate Risk**	**Water Ecosystem** • Settling ponds need will be part of the Fish breeding design to retain effluent for at least 48 hours allowing the waste to sink and allowing for breakdown and hydrolysis of organic matter thus reducing eutrophication in nearby water bodies.	PMU & Contractor
	15.	Run offs of construction Materials from the construction site	Negative. **Low Risk**	During construction, the contractor will ensure that construction materials are contained to avoid significant siltation to nearby surface water bodies.	Contractor

			Negative. **Low Risk**	The Contractors will ensure that construction debri is disposed of at an approved dumping site and not thrown into the swamps or rivers	Contractor
			Negative **Low Risk**	The site is away from surface water bodies(rivers, streams). However, appropriate erosion control measures, which include caring for the vegetation around the area will be enforced to reduce sediment loads into pathways that lead to nearby water bodies.	Contractor
HIV & AIDS risks	16.	Due to importation of labour, in most cases, these tend to relate with the locals of the opposite sex and indulge in sex, most times unprotected sex	Negative **Moderate Risk**	As a mitigation measure, the developer will ensure as much local labour as possible is engaged to handle various work activities. An awareness campaign will be initiated to sensitize the employees on the risks of STDs/HIV/AIDS.	Contractor , MoA
Employment creation	17.	Provision of employment contributes to raising the socio-economic well-being of the people thereby contributing to reducing poverty levels.	Positive	Local employment will be encouraged to employ youths from the neighboring communities for this impact, as much as possible, especially the unskilled and semi-skilled.	Contractor
Local Business Enhancement	18.	The business environment of the project area will improve as framers will have easy access of fingerling for fish production hence increasing the livelihood of the local farmers in Chongwe	Positive	Local employment will encourage local business in the area. The centre will support fish farming in the district.	Contractor

Contracting of service and goods suppliers	19.	A number of service suppliers will be contracted to supply services and goods such as building materials during construction , and production of fish in the district during operation phase	Positive	Contractors will be encouraged to get building materials locally to boost the local economy.	Contractor,

3. ENVIRONMENTAL & SOCIAL MONITORING PLAN

Environmental monitoring is the continuous assessment of project operation in relation to agreed schedules. It is an integral part of good management by the proprietor during the project cycle of the proposed Fish breeding facility.

The main objective of ESMP monitoring plan is to provide continuous feedback on preparation, construction, and operation phases, and to identify actual or potential successes or problems as early as possible, to facilitate timely adjustments to project operation. The creation or strengthening of monitoring activities under this project activity should not be seen as a temporary requirement, but an institution-building component of the project which should permanently improve overall management practice for the Fish Breeding management Unit that will be established.

Environmental monitoring ensures that the impacts have been accurately predicted and that appropriate mitigation measures are being implemented as planned and that they have the expected effects. Identification of environmental impacts associated with the operations of the fuel station indicates a need to implement a specific environmental monitoring plan. The monitoring process of the facility will begin with frequent supervision of operation by the ESS Committee, District Fisheries department, and MoA. With support from the Project ESS Specialist. The environmental objectives of these activities are to ensure mitigation measures outlined are being properly implemented and that environmental measures are being respected.

The objective of a monitoring system is to assist project management through:

- Defining requirements and procedures for environmental monitoring, including equipment needs, frequencies of monitoring, parameters, analytical services required, data management and presentation etc.
- Identifying targets and objectives for project life cycle activities.
- Maintaining easily retrievable records of project construction and operation activities which can be used for evaluation.
- Identifying problems encountered by the project and defining procedures for environmental control, in the event of pollution or similar incidents requiring action and,
- Providing readily available analyses for decision-making.

The key components of the proposed environmental and social monitoring plan are presented in Table 2 on the overleaf.

Table 2: Environmental and Social Monitoring Plan-Proposed Chongwe Fish Breeding Facility

Environmental Aspect/Issue		Frequency of Monitoring	Time Frame	Performance Indicator	Person Responsible
Site clearance.	Loss of terrestrial remnant flora including rejuvenating species	Every day during construction Phase	Short Time, Construction Phase	No of trees and Extent of vegetation preserved on site	Contractor, Camp Extension Officer, ESS Committee
	Soil erosion due to land clearing	Every day during construction Phase	Short Time, Construction Phase	Drainage constructed	Project Manager
	Loss of habitat for birds, ants, insects, etc.	Every day during construction Phase	Short Time, Construction Phase	Medicinal tree preserved if available	Contractor, Camp Extension Officer, ESS Committee
	Emission of dust on exposed surface	Every day during construction Phase	Short Time, Construction Phase	No of complaints about dust from the site received during construction	Contractor, Camp Extension Officer, ESS Committee
	Loss of Vegetation	Every day during construction Phase	Long term , post construction phase	Type of vegetation preserved I the area	Contractor, Camp Extension Officer, ESS Committee
		Weekly inspection of designs	Long term	Property checked before allowed to construct	Contractor, Camp Extension Officer, ESS Committee
Operation of heavy equipment during construction of Fish breeding facility	Improper handling of machinery can endanger the safety of employees	Every day during construction and operation phase	short term	Number of injury incidences	Contractor, Camp Extension Officer, ESS Committee
	The use of heavy equipment can compact and change the texture of the soil.	Every day during construction phase	short term	Access of Heavy equipment to the site	Project Manager
Spread of HIV/AIDS	Due to importation of labour, in most cases, these tend to relate with the locals of the opposite sex and indulge in	Weekly	short Term	No of sensitization meetings done	Chongwe, MoA, ESS Committee

Environmental Aspect/Issue		Frequency of Monitoring	Time Frame	Performance Indicator	Person Responsible
	sex, most times unprotected sex				
Generation of waste	Unsound management practices of waste have the potential to impact on the aesthetic value of the site and pollute land and water resources	Every day and throughout the project life	Long Term	Indiscriminate disposal avoided and waste collected for disposal to designated site	Contractor
Surface runoff		Every day during preparation phase	Long Term	drains constructed around the Fish Breeding Facility	Contractor
Groundwater	Water Quality sue to seepages	Monthly sampling of borehole water	Mid Term	Meets LWASCO standards or same as baseline values	Contractor
Generation of noise by various activities	The construction activities to be conducted are bound to generate noise levels to unsettle the neighborhood and school pupils	Throughout the project cycle	Long term	Noise levels lower than 85dB	Contractor
Employment creation	Provision of employment contributes to raising the socio-economic well-being of the people thereby contributing to reducing poverty levels.	N/A	Mid term	No of local persons employed	Contractor
Local Business Enhancement	The business environment of the project area will improve as framers will have easy access of fingerling for fish production hence increasing	N/A	Long term	Increased no of shops	Contractor

Environmental Aspect/Issue		Frequency of Monitoring	Time Frame	Performance Indicator	Person Responsible
	the livelihood of the local farmers in Chongwe				
Promoting aquaculture:	Fish farming will contribute to government's effort to promoting alternative source of income for farmers	N/A	Long Term	Increased alternative livelihood	MoA
Contracting of service and goods suppliers	A number of service suppliers will be contracted to supply services and goods such as building materials during construction , and production of fish in the district during operation phase	N/A	Mid term	M/A	Contractor

4. CONCLUSION

The proposed development of opening up a Fish Breeding Facility on a 1 Hectare plot at Margrete Mwachiyeya School, Lwiimba Agricultural Camo in Rural Chongwe District ,recognizes the importance of integrating the Environmental Social Safeguards before actual development takes effect. The proposed site, for the Fish Breeding Facility is currently a brown field(Already disturbed land) sitting on a government school premises and suitable for such developments. The proposed fish breeding facility will help in promoting aquaculture in the rural district of Chongwe. The Zambian Government has taken a deliberate policy to promote aquaculture fish farming in the country as an alternative source of livelihood for the country, therefore embarking on fish farming contributes under the SCRALA project will compliments government's effort to meet this goal.

For this Fish Breeding Facility, the major negative impacts that have been identified relates to Loss of Aquatic Ecosystems due to Sewage Disposal thus-fishponds Effluents and high prevalence of HIV/AIDS for school pupils. Nonetheless, with thorough implementation of the appropriate mitigation measures discussed in ESMP, it can be safe to conclude that the proposed site is suitable for use as a Fish breeding Centre for Chongwe Farmers. Special care will be implemented to ensure that contamination of the water resources through direct discharge of effluents from the facility into the water body is reduced. Wastewater from the fishponds will not directly discharged into the aquatic environment that may pollute the water resources. The measures that related to the risk to effluent discharge have been deemed adequate and implementable, consistent with the provisions in the Water Resource Management Act. Just to emphasize the point on solid waste management, there is already an existing solid waste collection in the under Chongwe Municipal Council, which has been deemed appropriate to extend the same service to the proposed project area. While the risks of HIV / AIDs will be managed through robust sensitizations at the school and neighboring communities, while enforcing the implementation of other mitigation measures by the contractor on site.