



# **SINDH LIVESTOCK AND AQUACULTURE SECTORS TRANSFORMATION PROJECT**

## **ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)**

**JANUARY, 2024**

**LIVESTOCK AND FISHERIES DEPARTMENT,  
SINDH**

**ISLAMIC REPUBLIC OF PAKISTAN**

## Contents

Executive Summary.....	8
1. Introduction.....	13
1.1. Project Background .....	13
1.2. Purpose of the ESMF .....	14
1.3. ESMF Preparation Methodology .....	14
2. Project Description .....	15
2.1. Project Development Objective .....	15
2.2. Project Components .....	15
2.3. Project Beneficiaries .....	17
2.4. Project Area.....	17
2.5. Project Implementation Arrangement.....	17
3. Environmental and Social Policies, Regulations, and Laws .....	19
3.1. Relevant National Policies and Regulations .....	19
3.2. World Bank Standards and Key Gaps with National/Provincial Framework .....	23
3.3. Obligations Under International Treaties.....	30
4. Environmental and Social Baseline .....	32
4.1. Physical Environment.....	32
4.1.1 Geography .....	32
4.1.2 Geology .....	32
4.1.3 Topography .....	32
4.1.4 Soil .....	33
4.1.5 Land Use.....	33
4.1.6 Water Resources .....	33
4.1.7 Climate.....	34
4.2. Ecological Environment.....	34
4.2.1 Ecologically Sensitive Areas.....	34
4.2.2 Biodiversity .....	35
4.3. Socioeconomic Conditions.....	38
4.3.1 Demography.....	38
4.3.2 Administrative Profile .....	39
4.3.3 Religious Minorities .....	39
4.3.4 Economy .....	39
4.3.5 Irrigation.....	39
4.3.6 Agriculture .....	40
4.3.7 Livestock and Aquaculture .....	40
4.3.8 Role of Women.....	41
4.3.9 Archaeological Sites .....	42

5.	Stakeholder Engagement, Disclosure, and Cosultations .....	43
5.1.	Summary of Stakeholder Engagement During Project Preparation .....	44
5.2.	Key Findings from Stakeholder Engagement During Project Preparation .....	44
5.3.	Summary of Project Stakeholder Needs, Methods, Tools, and Techniques for Engagement.....	49
5.3.1	Proposed Strategy to Incorporate the Views of Vulnerable Groups .....	49
6.	Grievance Redressal Mechanism .....	51
6.1.	Description of Grievance Redress Mechanism (GRM) .....	51
7.	Environmental and Social Impacts and Mitigation Measures .....	56
7.1.	Environmental and Social Positive Impacts .....	56
7.2.	Potential Environmental Impacts and Mitigation Measures.....	57
7.2.1	Technical Design and Layout Planning .....	57
7.2.2	Procurement of Pesticides and Vaccines.....	58
7.2.3	Soil Erosion and Contamination.....	59
7.2.4	Waste Generation .....	60
7.2.5	Health Care Waste Generation.....	61
7.2.6	Ambient Air Quality .....	62
7.2.7	Noise Pollution.....	63
7.2.8	Solarization of Facilities.....	64
7.2.9	Flora and Fauna (Ecological and Biodiversity) .....	64
7.3.	Potential Social Impacts and Mitigation Measures.....	68
7.3.1	Occupational Health and Safety Risks .....	68
7.3.2	Community Health and Safety.....	69
7.3.3	Security Issues.....	70
7.3.4	Gender Based Violence (GBV) .....	71
7.3.5	Forced/Child Labor.....	71
7.3.6	Targeting, Social Exclusion, and Elite Capture.....	72
7.3.7	Lack of Meaningful Community Engagement.....	73
7.3.8	Chance Findings of Important Physical and Cultural Resources .....	74
7.3.9	Exclusion Risks to Women.....	74
7.3.10	Land Acquisition and Involuntary Resettlement.....	75
7.3.11	Cold Chain Management for Vaccine Effectiveness .....	76
7.3.12	Impact of Disease Outbreak .....	76
8.	Implementation of ESMF.....	78
8.1.	Key Steps for Environmental and Social Management .....	78
8.2.	Screening Analysis – E&S Screening .....	79
8.3.	Environmental and Social Requirements in Bidding Documents .....	82
8.4.	Institutional Capacity.....	82
8.5.	Institutional Arrangements for E&S Implementation .....	83
8.6.	Contingency Emergency Response Component .....	84

8.7.	Roles and Responsibilities Entities Involved in E&S Management .....	84
8.8.	Environmental and Social Mitigation and Monitoring Plan.....	86
8.9.	Monitoring.....	107
8.10.	Reporting and Documentation.....	107
8.11.	Training and Capacity Building .....	107
8.12.	ESMF Disclosure .....	108
8.13.	Tentative ESMF Implementation Budget.....	109
Annex A – Key Wildlife Species of Conservation Concern and Their Protection Status Under the Sindh Wildlife Protection Act .....		110
Annex B – E-Waste Management Procedure.....		113
Annex C – Chance Find Procedures.....		114
Annex D – Environmental and Social Screening Checklists .....		116
Annex E – Template of ESMP .....		125
Annex F – Environmental and Social Monitoring Checklist for Producer Groups/Productive Alliances .....		127

## List of Annexes

- Annex-A: Key Wildlife Species of Conservation Concern and their Protection Status Under the Sindh Wildlife Protection Act
- Annex B: E-Waste Management Procedure
- Annex C: Chance Find Procedures
- Annex-D: Environmental and Social Screening Checklists
- Annex E: Template of ESMP
- Annex F: Environmental and Social Monitoring Checklist for PGs/PAs

## Abbreviations and acronyms

AI	Artificial Insemination
BOQ	Bill of Quantity
BP	Business Plan
CERC	Contingent Emergency Response Component
CPS	Country Partnership Strategy
CVDL	Central Veterinary Diagnostic Laboratory
DCC	District Coordination Committee
E&S	Environmental and Social
EHS	Environment, Health and Safety
EPA	Environmental Protection Agency
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
FAO	Food and Agriculture Organization
FDir	Sindh Livestock and Fisheries Department Directorate for Inland Fisheries
FMD	Foot-and-Mouth Disease
GBV	Gender Base Violence
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	geographic information system
GoP	Government of Pakistan
GoS	Government of Sindh
GRM	Grievance Redressal Mechanism
ICT	Information and Communication Technology
IEE	Initial Environmental Examination
IUCN	International Union for Conservation of Nature
LDir	Sindh Livestock and Fisheries Department Directorate for Livestock
LMP	Labor Management Plan
LSD	Lumpy Skin Disease
LSP	Local Service Provider
M&EC	Monitoring and Evaluation Consultant
MCC	Milk Collecting Center
MIS	Management Information System
MPG	Milk Producers Group
NOC	No Objection Certificate
OHS	Occupational Health and Safety
PA	Productive Alliance
PCMU	Project Coordination Management Unit
PD	Project Director
PDNA	Post-Disaster Needs Assessment
PDO	Project Development Objective

Sindh Livestock and Aquaculture Sectors Transformation Project - ESMF

PG	Producer Group
PIC	Project Implementation Consultant
PIM	Project Implementation Manual
PMU	Project Management Unit
PPE	Proper Personal Protective Equipment
PSC	Project Steering Committee
SAGP	Sindh Agriculture Growth Project
SEP	Stakeholder Engagement Plan
SEPA	Sindh Environmental Protection Agency
SEQS	Sindh Environmental Quality Standards, 2016
SIAH	Sindh Institute of Animal Health
SLAST	Sindh Livestock and Aquaculture Sectors Transformation
SME	Small and Medium Enterprise
SWMPs	Solid Waste Management Plans
TAD	Transboundary Animal Disease
VC	Value Chain
WB	World Bank
WB-ESSs	World Bank Environmental and Social Standards

## Executive Summary

The provincial Government of Sindh (GoS), through Sindh Livestock and Fisheries Department (Implementing Agency) is planning to undertake ***Sindh Livestock and Aquaculture Sectors Transformation Project (SLAST)***<sup>1</sup>. This Environmental and Social Management Framework (ESMF)<sup>2</sup> is developed to support the environmental and social due diligence provisions for activities financed by the World Bank in the proposed project. This ESMF follows the World Bank Environmental and Social Framework (ESF) as well as prevailing legislation in the country (National/Provincial), in particular Sindh Environmental Protection Act 2014. This ESMF will be used as a guideline document to prepare site specific Environmental and Social (E&S) instruments during project implementation stage.

**Project Background:** In Sindh, agriculture contributes 24 percent of provincial GDP and 70 percent of employment. The livestock and aquaculture sectors contribute over 62.68 percent of the agriculture GDP, about 14.36 percent of national GDP (Economic Survey of Pakistan 2022-23). Improving the growth of the livestock and aquaculture sectors, especially among small and medium farmers, is essential to creating a world free of poverty on a livable planet. In Sindh, about 30-35 percent of the population lives below the poverty line and the poor are found to derive 56 percent of their income from agriculture. At the same time, the prevalence of undernourishment and stunting in children under five in Sindh is 34 percent and 45.5 percent respectively and exceeds the national averages of 20 percent and 40 percent. Currently around 70 percent of milk is consumed at home resulting in seven to eight liters of milk consumed per household per day. Greater and quality fish consumption, which provides nutrients and healthy fats, can further contribute to improved nutrition, especially among the poor. On-farm and off-farm constraints are slowing down the modernization of the livestock and aquaculture sectors. Greater value addition along the agri-food value chain (VC) will, however, be needed to meet domestic and export market requirements. In Sindh, approximately 31 percent of women depend on livestock as a source of livelihood. Barriers such as social norms, lack of access to information and credit, low literacy, household and childcare duties, and restricted mobility limit women's participation in both the livestock and aquaculture sectors, resulting in women's lower productivity and income. Climate change constitutes a key threat to Pakistan's livestock and aquaculture sectors. Floods are a principal hazard in Sindh, during the September 2022 floods, it is estimated that 1.4 million heads of ruminants (3 percent of the total), 7 million heads of poultry (4 percent of total), and over 80 percent of aquaculture ponds were lost in Sindh. Introducing sustainable and climate-smart practices in livestock and aquaculture production has the potential to improve climate resilience and increase productivity, which will in turn decrease livestock's GHG emissions intensity. The SLAST project will promote climate-smart, competitive, and inclusive livestock and aquaculture sectors in Sindh.

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<sup>1</sup> Proposed Project: : Previous abbreviated name was LIVAQUA and the present proposed by the SL&FD is SLAST

<sup>2</sup> Since, the exact extent and precise location/footprints of individual interventions are yet to be decided, a framework approach has been adopted through this ESMF.



**Project Development Objective:** The proposed Project Development Objective (PDO) is to promote climate-smart, competitive, and inclusive livestock and aquaculture sectors in Sindh.

**Project Components:** The proposed Project has four components;

**Component 1: Strengthening the Enabling Environment for Sectoral Growth:** This component aims to support an inclusive, climate-resilient, and sustainable sector development through the adoption of climate-smart practices (CSP) by livestock and aquaculture producers. It will do so by (i) improving the policy, strategic, and regulatory frameworks for the sector, and improving and centralizing data collection and monitoring mechanisms for evidence-based decision making; and (ii) strengthening the delivery of essential public good knowledge, inputs, and services to livestock and aquaculture producers by the public and private sectors. This component has two subcomponents: **Subcomponent 1.1: Improvement of Sector Policies, Strategies, and Regulations and of Evidence-based Decision Making** and **Subcomponent 1.2: Strengthening the Delivery of Public Good Knowledge, Inputs, and Services**

**Component 2: Promotion of Climate-Smart Production, Value Addition, and Inclusive Access to Markets:** This component will seek to support growth-oriented farmers through a PA approach to (i) intensify and add value to their production; and (ii) establish and/or upgrade their market linkages with off-takers in a market-driven, profitable, and sustainable way. Producers and PGs will receive both TA from local service providers (LSP) and direct financial support, including support to strengthen their climate resilience and potential for climate mitigation. This component has two subcomponents: **Subcomponent 2.1: Capacity Building and Development of Horizontal and Vertical Alliances** and **Subcomponent 2.2 Improving the Market Integration of PGs for Increased Climate-Smart Production and Value Addition.**

**Component 3: Project Management, Monitoring, and Learning:** This component will support the overall management, implementation, and supervision of project interventions, capacity building, as well as monitoring, communication, dissemination, and continuous learning throughout the life of the project.

**Component 4: Contingent Emergency Response Component:** This component will allow for rapid reallocation of project proceeds in the event of a natural or man-made disaster or crisis that has caused or is likely to imminently cause a major adverse socio-economic impact.

***Environmental and Social Policies, Regulations and Laws:*** This ESMF has been prepared to address the requirements detailed in the WB ESF addressing environmental and social aspects and considerations. The Environmental and Social Standards (ESSs) relevant to the proposed Project are ***ESS-1: Assessment and Management of Environmental and Social Risks and Impacts, ESS-2: Labor and Working Conditions, ESS-3: Resource Efficiency and Pollution Prevention, ESS-4: Community Health and Safety, ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement, ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources ESS8: Cultural Heritage and ESS-10: Stakeholder Engagement and Information Disclosure.*** In addition, the ESMF addresses the requirements defined in the national and provincial regulations,

most importantly, The ***Sindh Environmental Protection Act, 2014***. In the same context a number of other relevant laws, guidelines and policies have been discussed in Chapter 3.

**Stakeholder Engagement, Disclosure and Consultations:** A detailed Stakeholder Engagement Plan (SEP) has been prepared for the project, in accordance with the World Bank ESS 10 (Stakeholder Engagement and Information Disclosure), to provide guidance on stakeholder engagement by defining approaches for public consultation and information disclosure through the project lifecycle. It outlines the ways in which the project team will communicate with stakeholders, and includes a mechanism by which stakeholders can raise concerns, provide feedback, and make grievances related to project activities. The SEP, being a live document is to be updated throughout the life of the project to ensure effective, robust and transparent stakeholder engagement. During project preparation, the team conducted extensive community consultations across 7 districts, visiting 17 villages/locations. Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) were held with 211 livestock farmers (including 85 women), and 48 aquaculture farmers, with only 3 being female. Meetings with six Milk Producer Groups (MPGs) established under SAGP were also held. Additionally, vulnerable and disadvantaged groups such as farm labor, women, the ultra-poor, and traditional fishing communities of Mohana (Mirbahar, Mallah, Mirani caste) were consulted. Institutional consultations involved various government authorities such as the Environmental Protection Agency, Livestock and Fisheries Department officials, the Wildlife Department of Sindh, Forest Department of Sindh, Sindh Fisheries and Aquaculture Research Institute (SFARI), Animal Health Hospital in Jamshoro and Khairpur, District level Agriculture, Livestock and Fisheries Officers; as well as representatives from NGOs and the private sector like the Aquaculture Farmers Association and the Sindh Rural Support Organization. Key Findings from Stakeholder Engagement During Project Preparation has been considered during the preparation of ESMF.

**Grievance Redress Mechanism:** A Grievance Redress Mechanism (GRM) is a system that allows not only grievances, but also queries, suggestions, positive feedback, and concerns of project-affected parties related to the environmental and social performance of a project to be submitted and responded to in a timely manner. The project will prepare a detailed GRM at effectiveness to receive, address and monitor complaints and community feedback. As the project makes use of varying types of labor across all components, a separate GRM specifically designed for project labor has been prepared as part of the Labor Management Procedures, in line with the requirements set out in ESS2 Labor and Working Conditions.

To address any complaints related to GBV/SEA/SH, the project will ensure that GBV related grievances received by the GRM are referred to relevant GBV service providers. Dedicated trained female staff will be appointed to receive and process GBV related complaints. Special considerations will be taken to ensure that the complainant's identity is treated as privileged information, and the option to lodge the complaint anonymously will also be provided. Additionally, all GRM response teams will be trained on GBV, SEA and SH. Detailed protocols for receiving, managing and addressing complaints related to GBV/SEA/SH will be developed in the GBV/SEA/SH Action Plan and added to the GRM.

**Potential Environmental and Social Impacts and Mitigations:** Based on the WB ESF standards, the environmental and social risk of the project is categorized as “Substantial”. The potential environmental and social risks for project, including but not limited to: soil erosion and contamination, waste generation, ambient air quality, noise pollution, procurement of pesticides and vaccines, clearing and damage to native vegetation and introduction of exotic species, hunting, poaching and accidental mortalities of wildlife, use of lethal drugs and pesticides resulting in mortality of wildlife, disease transmission from livestock to wildlife, introduction of alien invasive fish species, effects on water and land resources, occupational and community health and safety, security Issues, gender base violence (GBV), forced/child Labor, targeting social exclusion and elite capture, lack of meaningful community engagement, chance findings of important physical and cultural resources, exclusion risks to women, land acquisition and involuntary resettlement, cold chain management for vaccine effectiveness, disease outbreak. Most of the above-stated risks and impacts are temporary site-specific, reversible and manageable by adopting mitigation measures provided in this ESMF, in accordance with the mitigation hierarchy under the relevant ESSs.

**Environmental and Social Risks and Impacts Management:** The Sindh L&FD will lead the implementation of the proposed Project. The L&FD has prior experience on a World Bank funded project (Sindh Agricultural Growth Project- P128307) closed in June, 2019. The project was under safeguards policies with category B and received a satisfactory rating upon completion. Currently, however, the L&FD does not have dedicated staff or resources to manage environmental or social risks associated with the proposed project. Also, the proposed Project is being processed under ESF, on which the client needs detailed orientation and training. Hence the borrower capacity in ESF is considered low at the concept stage. The project implementation mechanism will comprise a Project Coordination Unit (PCU) at the level of the secretary L&FD, led by a Project Coordinator, and a PIU , headed by a Project Director and two Deputy Project Directors (Livestock Administrative and Aquaculture Administrative, housed in the livestock and fisheries directorates respectively). The PCU will employ a senior safeguards specialist (environmental and social) and a gender specialist, and each of the Deputy Project Directors will have an environmental specialist and social specialist on their teams, along with 10 District Field Managers. The project will reassess the capacity needs and staffing requirements of the project during project preparation.

Apart from this regular E&S setup, Project Implementation Consultant (PIC) will be hired to support the project implementation and also ensure supervision and compliance in line with the World Bank and local requirements in the field. Additionally, the effectiveness of these implementation and compliance is regularly validated and assessed by the Monitoring and Evaluation Consultants (MEC), as an independent/third party monitor.

Throughout the Project implementation stage, training and awareness raising will be provided to relevant stakeholders, such as project staff, selected contractors, and communities, to support the implementation of the environmental and social risk management mitigation measures. Third Party will be recruited to monitor compliance including compliance of E&S instruments of the project on annual basis throughout the

project duration. The third party will have E&S Specialists to carryout intermittent monitoring of the project. Contractors will be required to comply with the Project's E&S risk management documents and procedures including the ESMP, LMP, and local legislation. This provision will be specified in the Contractor's agreements. Similarly, other related aquaculture and livestock activities conducted by PGs and PAs during project implementation will ensure compliance with the E&S requirements through an Agreement with the support of PCU and PIU during project implementation.

Reports covering E&S implementation status from the field levels will be submitted to the WB on a quarterly basis. Reports from the field levels will be submitted to the PCU, where they will be aggregated and submitted to the World Bank on a quarterly basis. The PCU /PIU when becomes aware of a serious incident in connection with the project, which may have significant adverse effects on the environment, the affected communities, the public, or workers, it should notify the World Bank within 48 hours of becoming aware of such incident.

The ESMF and other E&S instruments after review and clearance from the bank will be disclosed on the official website of project, and shall also be available in World Bank repositories. Executive summaries of each instrument will be translated into Urdu and Sindhi and will also be made available. A copy of the GRM will be placed in the PMU for public access. The GRM will be translated into regional languages i.e., Urdu and Sindhi

**ESMF Implementation Budget:** The tentative cost estimates to implement ESMF is estimated as PKR **551.2 Million**. This tentative cost will be included in the overall project cost. This cost will be reviewed and firmed up periodically when the project footprints will be finalized at subproject level to ensure realism. Additional costs could be included in the subproject specific ESMPs that will become part of each bidding/BOQ documents.

## 1. Introduction

The provincial Government of Sindh (GoS), through Sindh Livestock and Fisheries Department (Implementing Agency) is planning to undertake ***Sindh Livestock and Aquaculture Sectors Transformation Project*** (SLASLT)<sup>3</sup>.

This Environmental and Social Management Framework (ESMF)<sup>4</sup> is developed to support the environmental and social due diligence provisions for activities financed by the World Bank in the proposed project. This ESMF follows the World Bank Environmental and Social Framework (ESF) as well as prevailing legislation in the country (National/Provincial), in particular Sindh Environmental Protection Act 2014. This ESMF will use as a guideline document to prepare site specific Environmental and Social (E&S) instruments during project implementation stage.

### 1.1. Project Background

In Sindh, agriculture contributes 24 percent of provincial GDP and 70 percent of employment. The livestock and aquaculture sectors contribute over 50 percent of the agriculture GDP, about 12 percent of national GDP. Despite good agro-climatic conditions, Pakistan lags its neighbors in aquaculture production.

Improving the growth of the livestock and aquaculture sectors, especially among small and medium farmers, is essential to creating a world free of poverty on a livable planet. In Sindh, about 30-35 percent of the population lives below the poverty line and the poor are found to derive 56 percent of their income from agriculture. At the same time, the prevalence of undernourishment and stunting in children under five in Sindh is 34 percent and 45.5 percent respectively and exceeds the national averages of 20 percent and 40 percent. Currently around 70 percent of milk is consumed at home resulting in seven to eight liters of milk consumed per household per day. Greater and quality fish consumption, which provides nutrients and healthy fats, can further contribute to improved nutrition, especially among the poor. On-farm and off-farm constraints are slowing down the modernization of the livestock and aquaculture sectors. Greater value addition along the agri-food value chain (VC) will, however, be needed to meet domestic and export market requirements.

In Sindh, approximately 31 percent of women depend on livestock as a source of livelihood. Barriers such as social norms, lack of access to information and credit, low literacy, household and childcare duties, and restricted mobility limit women's participation in both the livestock and aquaculture sectors, resulting in women's lower productivity and income.

Climate change constitutes a key threat to Pakistan's livestock and aquaculture sectors. Floods are a principal hazard in Sindh, during the September 2022 floods, it is estimated that 1.4 million heads of ruminants (3 percent of the total), 7 million heads of poultry (4 percent of total), and over 80 percent of aquaculture ponds were lost in Sindh. Introducing sustainable and climate-smart practices in livestock and aquaculture production has the

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<sup>3</sup> Proposed Project

<sup>4</sup> Since, the exact extent and precise location/footprints of individual interventions are yet to be decided, a framework approach has been adopted through this ESMF.

potential to improve climate resilience and increase productivity, which will in turn decrease livestock's GHG emissions intensity. The SLAST project will promote climate-smart, competitive, and inclusive livestock and aquaculture sectors in Sindh.

## **1.2. Purpose of the ESMF**

The objective of the ESMF is to assess and mitigate potential negative environmental and social risks and impacts of the Project consistent with the Environmental and Social Standards (ESSs) of the World Bank ESF and national requirements. More specifically, the ESMF aims to (a) assess the potential environmental and social risks and impacts of the proposed Project and propose mitigation measures; (b) establish procedures for the environmental and social screening, review, approval, and implementation of activities; (c) specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social issues related to the activities; (d) identify the staffing requirements, as well as the training and capacity building needed to successfully implement the provisions of the ESMF; (e) address mechanisms for public consultation and disclosure of project documents as well as redress of possible grievances; and (f) establish the budget requirements for implementation of the ESMF.

This ESMF should be read together with other plans prepared for the project, including the Stakeholder Engagement Plan (SEP), the Environmental and Social Commitment Plan (ESCP) and Labor Management Plan (LMP).

## **1.3. ESMF Preparation Methodology**

- Review of project details and description to understand project activities likely to impact socio-economic environment.
- Review of relevant legislations, policies, standards and guidelines to determine the policy, legal and institutional environment for the Project based on World Bank ESF, national and provisional level.
- Review of secondary literature to understand project area, sample safeguards guard documents to guide this assessment; and different published development reports for taking stock of environmental and socioeconomic baseline conditions.
- Conducting consultation with project stakeholders.
- Scoping, screening and impact assessment while developing interaction between project activities and key environmental aspects to screen out the significance of adverse environmental, biological and social impact and proposing generic mitigation measures.
- Procedures for environmental and social management, to manage and monitor the environmental and social aspects of the project.
- Estimation of budget to ensure the effective implementation of all the mitigation measures/ actions proposed in the ESMF.

## 2. Project Description

This chapter describes the salient features of the Project including development objectives, components and implementation arrangement.

### 2.1. Project Development Objective

The proposed Project Development Objective (PDO) is to promote climate-smart, competitive, and inclusive livestock and aquaculture sectors in Sindh.

### 2.2. Project Components

The project scope consists of four components, the brief description of each component is given below:

#### **Component 1: Strengthening the Enabling Environment for Sectoral Growth**

This component aims to support an inclusive, climate-resilient, and sustainable sector development through the adoption of climate-smart practices (CSP) by livestock and aquaculture producers. It will do so by (i) improving the policy, strategic, and regulatory frameworks for the sector, and improving and centralizing data collection and monitoring mechanisms for evidence-based decision making; and (ii) strengthening the delivery of essential public good knowledge, inputs, and services to livestock and aquaculture producers by the public and private sectors. The component's contribution to climate adaptation and mitigation is elaborated in the project's Climate Change Technical Note.

**Subcomponent 1.1: Improvement of Sector Policies, Strategies, and Regulations and of Evidence-based Decision Making** will provide technical assistance to the Sindh Livestock and Fisheries Department (L&FD) for the formulation and adoption of sector policies and action plans, as well as the establishment of inclusive policy dialogue and monitoring mechanisms. It will also support (i) the formulation or update of specific sector strategies and regulations (i.e., breeding strategies, animal health strategies and regulations, disease surveillance and control plans, ecosystem-based approach implementation and environmental impact reduction strategies, aquaculture post-harvest strategy, and so on); and (ii) the preparation of contingency plans against priority diseases, as well as for climatic emergencies.

This sub-component will also strengthen the capacity of institutions in the livestock and aquaculture sectors to collect and centralize data for sector-wide data analysis, monitoring, and evidence-based decision making. This will include in particular (i) strengthening disease reporting systems; (ii) creating databases and performance recording systems for breeding stock; (iii) establishing georeferenced sector databases and dashboards, which allow to apply integrated zone management plans and to identify climate risks and vulnerabilities, (iv) creating a data and knowledge sharing system; and (v) strengthening the L&FD's capacity for data analysis.

**Subcomponent 1.2: Strengthening the Delivery of Public Good Knowledge, Inputs, and Services** will support public and private institutions providing key public good knowledge, inputs, and services to livestock and aquaculture producers, such as (i) animal health services; (ii) breeding and genetic improvement services; (iii) extension and advisory

services (e.g., Farmers Field Schools, Pond Schools, village demonstration units); (iv) research and development and technology transfers; and (v) certification and quality control services. This support will entail investments in public infrastructure (i.e., livestock and aquaculture public institutions), equipment (e.g., laboratory equipment, climate smart equipment), inputs (i.e., vaccines for vaccination campaigns), and capacity building of staff (e.g., on improved equipment utilization). Special large-scale operations such as vaccination campaigns against transboundary animal diseases (TAD) and the distribution of improved genetic material, as well as awareness campaigns will also be supported. The delegation of essential services to private sector service providers (e.g., vaccination campaigns, surveillance) will be encouraged under the leadership of public institutions.

## **Component 2: Promotion of Climate-Smart Production, Value Addition, and Inclusive Access to Markets**

This component will seek to support growth-oriented farmers through a PA approach to (i) intensify and add value to their production; and (ii) establish and/or upgrade their market linkages with off-takers in a market-driven, profitable, and sustainable way. Producers and PGs will receive both TA from local service providers (LSP) and direct financial support, including support to strengthen their climate resilience and potential for climate mitigation. The component's contribution to climate adaptation and mitigation is elaborated in the project's Climate Change Technical Note.

The project will focus on four subsectors with the greatest potential for climate-smart, competitive, and inclusive development, namely dairy, red meat from large ruminants, red meat from small ruminants, and aquaculture. To mitigate the risks of elite capture and to promote inclusion, this component will focus its support on SMPs. Project activities are designed to best suit the needs of SMPs by providing dedicated support to the mobilization and market integration of PGs. Additional measures to mitigate the risk of elite capture are included, such as selection criteria and control mechanisms.

**Subcomponent 2.1: Capacity Building and Development of Horizontal and Vertical Alliances** aims to (i) strengthen the technical and business capacities of growth-oriented SMPs; and (ii) establish/upgrade market linkages between these producers organized in PGs and buyers following a PA approach. This subcomponent will finance goods and services needed to build the capacity of SMPs, establish PAs, and develop business plans (BP) as part of PAs.

**Subcomponent 2.2 Improving the Market Integration of PGs for Increased Climate-Smart Production and Value Addition** aims to (a) increase productivity and production in a climate-smart way; and (b) improve market integration and value addition. Increased value addition is expected to lead to reduced food loss and waste (FLW), which, combined with productivity increases, will lead to reduced GHG emissions intensity. This subcomponent will provide matching grants for investments in TA, productive assets, and inputs.

Financial support will be awarded based on a competitive process. Applicants will have to meet a set of eligibility criteria to present their BP, which will then be assessed based on additional relevant prioritization criteria. Financial support to PGs will be provided only for investments needed to meet the market specifications agreed upon with the buyer as part



of the PA. In addition, the design of the matching grant financing mechanism will include dedicated measures to mitigate the risk of crowding out commercial financing, especially from micro-finance providers. TA will systematically be provided to support the implementation of BPs, notably to build entrepreneurship capacities and promote the proper adoption of climate-smart technologies and value-addition practices thereby maximizing the sustainability of investments.

### **Component 3: Project Management, Monitoring, and Learning**

This component will support the overall management, implementation, and supervision of project interventions, capacity building, as well as monitoring, communication, dissemination, and continuous learning throughout the life of the project.

### **Component 4: Contingent Emergency Response Component**

This component will allow for rapid reallocation of project proceeds in the event of a natural or man-made disaster or crisis that has caused or is likely to imminently cause a major adverse socio-economic impact.

## **2.3. Project Beneficiaries**

The project's main beneficiaries are small and medium livestock and aquaculture producers and their households. The project will directly benefit over 940,000 farm families. Under component 1, it is estimated that strengthened livestock services will increase their outreach from the current 25-30 percent of livestock rearing households to 55 percent, which represents over 900,000 households and 4.5 million beneficiaries, distributed all over the Sindh Province.<sup>5</sup> Component 2 will target approximately 25,000 growth-oriented SMPs organized in about 1,000 PGs for improved market aggregation and market access. The project will also undertake dedicated sensitization and implementation support tailored to female farmers' needs to ensure their participation in the project. Three other groups are expected to benefit from the project including relevant government institutions, domestic private sector companies and livestock and aquaculture processors and other off-takers.

## **2.4. Project Area**

The project will cover all districts in the Sindh province using a phased approach. Districts that have benefited from interventions of the Sindh Agriculture Growth Project (SAGP) and are benefiting from the Sindh Water and Agriculture Transformation Project (SWAT) will be targeted first, as producers in these districts have the greatest potential to adopt CSPs, increase their productivity, and access markets. The targeting of Component 2 beneficiaries will be demand-driven and will cover the whole province.

## **2.5. Project Implementation Arrangement**

Overall responsibility for project implementation, including management of environmental and social risks, will be delegated to L&FD of the Government of Sindh. Implementation of the project will take place over six years to allow a realistic timeframe for implementation.

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<sup>5</sup> Over 900,000 households will be reached through strengthened veterinary services and mass vaccination campaigns, and over 10,000 of them will benefit from additional improved artificial insemination services.

The governance structure for the project will include a Project Steering Committee (PSC)<sup>6</sup> and a Project Technical Committee (PTC)<sup>7</sup>.

The project's implementation mechanism will comprise a Project Coordination Unit (PCU) at the level of the Secretary L&FD, and a Project Implementation Unit (PIU) based in L&FD. The PCU will have the overall responsibility of coordinating all aspects of the project. The main functions of the PCU will be to (i) coordinate, supervise, and monitor project's activities, notably in terms of fiduciary and environmental and social (E&S) management; and (iii) PC will supervise and monitor BPs and whereas, PD will be directly responsible for the screening and selection of BPs under Subcomponent 2.2 to ensure the market-driven and competitive nature of such selection. The PCU will include a senior safeguards specialist, and a gender specialist. The LDir and FDir will comprise the PIU, with a Deputy Project Director in each directorate. The two Deputy Project Directors will each be supported by an environmental specialist, social specialist, and 10 district field managers. The PIU will be responsible for the implementation of the project activities.

The project will be supported by Project Implementation Consultants (PICs) and Monitoring and Evaluation Consultants (M&ECs). Using resources allocated under Component 2 the PICs will provide: (i) support for design and supervision of construction works, and (ii) technical assistance and international expertise to strengthen the project's implementation mechanisms and build the capacity of the PCU and L&FD Directorates. The M&ECs will assist in: (i) monitoring and evaluating the project's physical progress and its impacts; and (ii) supervising the implementation of environmental and social management plans (ESMP).

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<sup>6</sup> The PSC will be composed of members from all concerned Departments and stakeholders and will serve as the advisory body of the project on its direction, scope, budget, timeline, and methods.

<sup>7</sup> The PTC will be composed of technical staff (specialists) from L&FD and members of all relevant technical stakeholders and will be responsible for monitoring project implementation.

### 3. Environmental and Social Policies, Regulations, and Laws

This section deals with the current legal and administrative framework required to prepare the ESMF of the proposed Project. Applicable WB Environmental and Social Standards (ESSs) and guidelines and Environmental and Social (E&S) Policies, laws, regulations laid out by the GoP, GoS have been duly discussed and the Project proponent will be required to adhere to these regulations throughout the course of the proposed Project.

#### 3.1. Relevant National Policies and Regulations

This section briefly describes the national and provincial laws and policies, relevant to the project and stipulates the various requirements that have been or will be complied with during the planning and implementation stages of the project. The summary of major relevant policies, acts and legislation are briefly described in Table 1.

**Table 1 National and Provincial Policies Legal Framework and Laws**

National & Provincial Policies, Rules and Regulations	Description	Project Relevance
Pakistan Climate Change Act 2017	To monitor implementation of the international agreements relating to climate change, approve and monitor implementation of comprehensive adaptation and mitigation policies, strategies, plans, programs, projects and other measures formulated by the authority to meet Pakistan's international obligations, monitor the implementation of National Adaptation Plan and its constituent provincial and local adaptation action plans, approves guidelines for the protection and conservation of renewable and nonrenewable resources, species, habitats and biodiversity adversely affected or threatened by climate change.	The emissions from the proposed project are not likely to be significant. However, the proposed project will respect the provision of this act and ensure efficient use of resources through implementation of measures provided in this ESMF.
National Disaster Management Act, 2010	The Act was passed in backdrop of 2010 Floods in Pakistan and strengthens Disaster Management system in the country. Most pertinent sections of this Act include section 6 that explains the functions of local authorities in terms of disaster management, and section 9 that explains how the sources of funding the government use finance the new disaster management projects.	This Act is relevant. Floods are a principal hazard in Sindh. Therefore, the project design will consider the flooding aspect, particularly for the civil works (rehabilitation and reconstruction of infrastructure such as office building, hatcheries, laboratories etc.) activities, where applicable.
Sindh Sanitation Policy, 2017	Provides a broad framework and policy guidance to the Sindh Government to enhance and support sanitation coverage in the country through the formulation of their sanitation strategies, plans, and programs, at all respective levels for improving the quality of life of the people of Pakistan and the physical environment necessary for a healthy life. The policy envisions creating an open defecation free environment with safe disposal of liquid and solid waste promoting health and hygiene practices in the country.	This policy is relevant as during the reconstruction and rehabilitation of health facilities and health services during operation will require mitigation of waste (solid/liquid) through proper disposal.

Sindh Livestock and Aquaculture Sectors Transformation Project - ESMF

National & Provincial Policies, Rules and Regulations	Description	Project Relevance
Sindh Environment Protection Act, 2014	A comprehensive legislation which provides legislative framework for protection, conservation, rehabilitation and improvement of the environment. It contains concrete action plans and programs for the prevention of pollution and promotes sustainable development.	The proposed Project is located in Sindh province, therefore, SEPA is primarily responsible for the enforcement of provisions. The proposed Project will comply with the requirements of Sindh Environmental Protection Act, 2014.
Sindh Environmental Protection Agency (Environmental Assessment) Regulations, 2021	Defines the categories for different projects, where the type of study/ assessment required (checklist, IEE, EIA) against each category of project is defined to fulfill local legal requirements pertaining to the environment.	The provisions of these regulations are applicable for environmental screening of the project, which implies which type of environmental study is required for the proposed project. The proposed Project will comply with the requirements of this regulations during the implementation stage where required.
Sindh Fisheries Ordinance, 1980	The Sindh Fisheries Ordinance, 1980 provides rules and regulations for marketing, handling, transportation, processing and storage of fish and shrimp for commercial purposes and sale of fish used for domestic and inter-provincial trade in the Province of Sindh. Contravention of this Ordinance is punishable by imprisonment up to six months or by a fine of PRs 10000, or both. A provision has also been included for a total ban on the use of destructive fishing gear, and for a closed season for shrimp during June and July.	The project will ensure the compliance with the requirements of this ordinance during the implementation of project.
Sindh Livestock Breeding Act, 2016	The Sindh Livestock Breeding Act, 2016, provides regulation of livestock breeding services, to improve genetic potential of breeds and protect indigenous breeds of livestock in the Sindh and to deal with ancillary matters.	The project will support two main types of activities aiming at improving their genetic potential: (i) strengthening the breeding and selection mechanisms to accelerate genetic progress, and (ii) supporting the dissemination of this genetic progress to rural farmers through improved outreach of AI services and distribution of improved bulls. Therefore, the Project will respect the requirements of this act during the implementation of project.
Sindh Solid Waste Management Act, 2021	The Sindh Solid Waste Management Act, 2021 for collection and disposal of all solid waste, to arrange effective delivery of sanitation services, to provide pollution free environment and to deal with other relevant matters.	These Rules are applicable to the proposed project, and the risk and non-risk wastes generated during the implementation of the project need to be handled and disposed of in accordance with these Rules. This ESMF will respect the provision of this rules.
Sindh Cultural Heritage	The cultural heritage laws of Pakistan are uniformly applicable to all categories of sites regardless of their	The project activities planned under the project are not anticipated to

Sindh Livestock and Aquaculture Sectors Transformation Project - ESMF

National & Provincial Policies, Rules and Regulations	Description	Project Relevance
(Preservation) Act, 1994	state of preservation and classification as monuments of national or world heritage.	directly impact any cultural heritage site. The project investments include civil works related excavation, therefore ESMF will include chance find procedures and screening checklist which will guide handling of cultural heritage discovered during commencement of Project.
Sindh Wildlife Protection, Preservation, Conservation and Management Act, 2020	<p>The Sindh Wildlife Protection, Preservation, Conservation and Management Act was approved in August 2020. The Act was passed to make provisions for protection, conservation, preservation, and sustainable use of wildlife for establishment, management and maintenance of protected areas in the Province of Sindh.</p> <p>The Act introduces the establishment of a Council for the Conservation of Wildlife, and other measures which guarantee and protect the rights and ensure safety of wildlife in the province of Sindh.</p>	This Act is not applicable, as direct impacts on the biodiversity and natural resources is not anticipated as reconstruction and rehabilitation activities will be carried out in the built environment. This ESMF ensures that no activity shall be carried out in the natural or critical habitat and avoid the intentional or accidental introduction of invasive alien species to avoid any risks of destroying native species.
The Sindh Occupational Safety and Health Act, 2017	The act makes provisions for occupational safety and health conditions at all workplaces in the province for the protection of workers during work.	The proposed Project is expected to involve direct workers, contracted workers and primary supplies. The project may create some labor related risks and impacts, which include lack of compliance with relevant laws and regulations, unsafe working conditions, OHS risks, and GBV/SEA/SH risks. Necessary mitigation measures have been provided in this ESMF to manage these risks. Moreover, a separate LMP has been prepared as a part of this Project.
The Sindh Occupational Health and Safety Rules 2019	Defines the need to make provisions for occupational safety and health conditions at all workplaces for the protection of persons at work against risk of injury arising out of the activities at work places and for the promotion of safe, healthy, and decent working environment adapted to the physical, physiological, and psychological needs of all persons at work and to provide for all matters connected therewith or ancillary thereto.	
Sindh Minimum Wages Act, 2015 (Sindh Act No. VIII of 2016)	To provide the regulation of minimum rates of wages and various allowances for different categories of workers employed in certain industrial and commercial undertakings and establishments.	This Act is applicable to the project to ensure that the minimum wages and allowances are given to the project labor (skill and unskilled employed for the reconstruction and rehabilitation activities and other staff involved during implementation of the proposed project.
The Sindh Prohibition of Employment of Children Act, 2017	Prohibition of Child Employment Act (PCEA) 2017 disallow child labor in Sindh. The PCEA defines a child as a person who has not completed his/her fourteenth years of age, and an adolescent means a person who has completed fourteenth year of age but has not completed eighteenth years of his age. No child shall be employed or permitted to work in any establishment including construction, but an adolescent can be employed or permitted to work under strict guidelines provided in the PCEA and rules. An adolescent shall not be employed in any	The relevance of this act to the project is to prohibit child employment as per conditions mentioned in this Act.

Sindh Livestock and Aquaculture Sectors Transformation Project - ESMF

National & Provincial Policies, Rules and Regulations	Description	Project Relevance
	hazardous work included in the schedule to the PCEA.	
The Protection Against Harassment of Women at the Workplace Act, 2010	The Act provides legal protection to women against harassment at the workplace. It focuses on sexual harassment experienced at the workplace by employees and facilitates the transformation of the work environment, so that it is free of sexual harassment, intimidation, and abuse. The law makes it a special crime to use force against a woman, or even threaten to use force, if the intention is to "disturb her modesty"	The efforts will be made to ensure that the women are not harassed during their involvement as workers or during visit of health care facility.
The Sindh Local Government (Amendment) Act, 2021	Under the Sindh Local Government Act 2013 (SLGA), Chapter VI, land use planning; implementation of building by-laws; management of environmental and health hazards; food adulteration; provision and maintenance of water supply schemes and public sources of drinking water; and mobilization of communities for the upgrade of local infrastructure (transportation, landscaping, and removal of encroachments) are the responsibilities of municipal corporations/committees. The 2021 amendment served to define municipal corporations and committees, along with establishing a relationship between elected councils and provincial departments working in administrative boundaries.	This act is applicable and the proposed Project will respect the provision of this act during implementation stage.
Sindh Hospital Waste Management Rules, 2014	HWM Rules 2014 envisage every hospital be responsible for both risk and non-risk waste's management, including the generation, handling, storage and disposal of all forms of waste, in accordance to Sindh environmental protection Act 2014.	This is applicable to the proposed project, and the risk and non-risk wastes generated during the implementation of the project need to be handled and disposed of in accordance with this rules. The rules describe the process for waste management including the generation, handling, storage and disposal of all forms of waste.
Sindh Empowerment of Persons with Disabilities Act 2018	Sindh Empowerment of Persons with Disabilities act 2018 provides legal protection to disable persons in terms of Equality and non-discrimination of 'Persons with Disabilities', right to privacy, Ease of access and mobility, Protection from torture or cruel, inhuman or degrading treatment, Freedom from Exploitation, violence and Abuse, Equity in health and rehabilitation services, Skills Development and Equity in Employment and in any other disability discrimination.	The relevance of this act to the project is to protect the rights of disabled persons by providing special services for them during the implementation of project.

### 3.2. World Bank Standards and Key Gaps with National/Provincial Framework

The project will follow the World Bank Environmental and Social Standards (ESSs), as well as the World Bank Group Environmental, Health and Safety Guidelines. Overall environmental and social risk classification of the project is assessed to be Substantial. The identified gaps between ESSs and national and provincial laws for E&S management and how these gaps are addressed in the ESMF are provided in Table 2. Where gaps exist between national laws vis-a-vis ESF, the most stringent requirements will prevail and will be followed during the implementation of proposed project.

**Table 2 Relevant World Bank ESS and Key Gaps with National Framework**

Environmental and Social Standard	Description	Relevance to the Project	Identification of Gaps in the context of local laws
ESS1 – Assessment and Management of Environmental and Social Risks and Impacts	This standard sets out the Client's responsibilities for assessing, managing, and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank through IPF, in order to achieve environmental and social outcomes consistent with the ESF.	Relevant. Overall, the project will have positive environmental and social impacts. The adverse environmental and social risk and impacts <sup>8</sup> are anticipated due to proposed reconstruction/ rehabilitation activities and inappropriate practices are observed during provision of the health services and can potentially cause health and safety hazards for the health service providers as well as for the livestock and the nearby community. The ESMF related site-specific instrument will be implemented throughout the project to comply with ESS1.	The criteria mentioned in the Acts for classifying environmental and social risk is different than in the ESF. Sindh Environmental Protection Act, 2014 and SEPA (Review of IEE and EIA) Regulations, 2014 mainly focus on environmental assessment and management through Environmental Impact Assessment (EIA) and Initial Environmental Examination (IEE). The different methods and tools (ESIA, environmental and social audit, commutative impact assessment, ESMP, ESMF, regional and sectoral ESIA, SESA etc.) for environmental and social impact assessments, referenced in the ESF, are not part of the National and Provincial legislation. The ESF highlight to consider the environmental and social risks and impacts associated with primary suppliers and disadvantaged or vulnerable groups while the local relevant laws do not.

<sup>8</sup> The environmental risks of the project associated with soil and water contamination likely to occur due to inappropriate disposal of wastes (including solid, packaging material, construction waste, vaccines/ syringes waste and waste from mobile dispensaries services and aquaculture activities), procurement of pesticides and fertilizers, introduction of invasive species, water pollution. Other risks associated with the Project are related to the targeting and selection of beneficiaries, inequitable distribution of project benefits, exclusion of disadvantaged and vulnerable groups, security and safety concerns, risk of expired medicines/vaccines, elite capture, GBV, forced labor, use of child labor, economic and/or physical displacement that can impact livelihoods etc.

Environmental and Social Standard	Description	Relevance to the Project	Identification of Gaps in the context of local laws
ESS2 – Labor and Working Conditions	<p>ESS2 recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote sound worker-management relationships and enhance the development benefits of a project by treating workers fairly and providing safe working conditions. This standard applies to project workers, including full-time, part-time, temporary, seasonal, and migrant workers.</p>	<p>Relevant. The proposed Project is expected to involve direct workers, contracted workers and primary supplies. The project may create some labor related risks and impacts, which include lack of compliance with relevant laws and regulations, unsafe working conditions, OHS risks, and GBV/SEA/SH risks. A standalone Labor Management Procedures (LMP) has been prepared as per the requirements of ESS2. The LMP will be noted in the legal agreement and in the Environmental and Social Commitment Plan (ESCP). Necessary mitigation measures are included in this ESMF apart from observing the WBG EHSG.</p>	<p>National and Provincial laws address most of the requirements of the ESS-2. However, the implementation of these laws and the management of certain issues addressed under ESS-2, such as OHS, GBV/SEA and Violence Against Children (VAC), prohibition of children in hazardous work and child labor and fair treatment, non-discrimination and equal opportunity, are not done effectively as detailed coverage of certain requirements is partial.</p>
ESS3 – Resource Efficiency and Pollution Prevention and Management	<p>ESS3 establishes the requirements for resource efficiency and pollution management and prevention during the entire project lifecycle. The objectives of this standard are to enhance the sustainable use of resources, including energy, water, and raw materials. It also aims to promote favorable conditions for human health and the environment by minimizing pollution from project activities, and or minimize generation of waste.</p>	<p>Relevant. The adverse environmental and social risk and impacts are anticipated due to proposed project activities. It is expected that there would be an increased number of beneficiaries visiting and availing the services offered by project. This may result in the increased use of resources such as water, electricity, and fuel for generators (alternate energy source).</p> <p>Awareness session for efficient use of electricity, water and other resources and waste management will be included in the project. Accordingly, necessary mitigation measures and waste management plan are included in this ESMF.</p>	<p>Local laws address most of the requirements of the ESS-3, particularly on pollution prevention</p>
ESS4 – Community Health and Safety	<p>This standard recognizes that project activities, equipment, and infrastructure can increase community</p>	<p>As the Project will involve significant contact between Project workers and beneficiary communities (through</p>	<p>Local laws address most of the requirements of the ESS-4. However, detailed coverage has not been</p>



Environmental and Social Standard	Description	Relevance to the Project	Identification of Gaps in the context of local laws
	<p>exposure to adverse risks and impacts. The objectives of ESS4 are to avoid or mitigate these adverse impacts on project-affected communities.</p>	<p>mass awareness campaigns, farmer field schools, pond schools, village demonstration units), there is a possible risk of such contact leading to an increase in the rate of communicable diseases, GBV, SEA, and SH. The improper use and / or disposal of syringes used for vaccines, and that of pesticides, fertilizers and feed for livestock and fish, may also pose a risk to the community who may be inadvertently exposed, and to informal waste/sanitation workers that are prevalent in the region. Planned civil works may also cause disturbances to local communities during reconstruction and rehabilitation activities.</p>	<p>provided in the local laws (national and provincial) in comparison to ESS-4.</p>
<p>ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement</p>	<p>This standard recognizes that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons. Project-related land acquisition or restrictions on land use may cause physical displacement (relocation, loss of residential land or loss of shelter), economic displacement (loss of land, assets or access to assets, leading to loss of income sources or other means of livelihood), or both. The term “involuntary resettlement” refers to these impacts. Resettlement is considered involuntary when affected persons or communities do not have the right to refuse land acquisition or restrictions on land use that result in displacement.</p>	<p>Relevant. At this stage as there is no private land acquisition or involuntary resettlement anticipated as a result of this Project. Construction of district veterinary complexes may require government land. Additionally, Voluntary Land Donation may be required for setting up of facilities for producer groups alliances for livestock and aquaculture activities. The exact locations for the above are not known at this stage, therefore this standard is deemed relevant and will be further assessed during project preparation stage.</p>	<p>LAA 1894                      There is no requirement for screening and scoping of project.                      No specific requirements for meaningful consultations with affected persons, other stakeholders and vulnerable groups.                      No specific requirements for participation of displaced persons in planning, implementation and monitoring of resettlement programs.                      Does not require establishment of a GRM.                      Silent about compensations related to restoration and improvement of livelihoods. Generally, it covers cash compensation policy for the acquisition of land and built-up property, and damage to other assets such as crops, trees, and infrastructure.                      Does not provide additional support to the displaced poor or vulnerable</p>

Environmental and Social Standard	Description	Relevance to the Project	Identification of Gaps in the context of local laws
ESS6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources	<p>This standard recognizes biodiversity conservation and protection, and sustainable management of living natural resources. It gives importance to maintaining the core ecological functions of habitats and wildlife and promotes the sustainable management of primary production and harvesting of living natural resources. The objectives of this standard are to protect and conserve biodiversity and habitats, and avoid adverse impacts on biodiversity and habitats as a result of project activities.</p>	<p>Relevant: The reconstruction and rehabilitation activities will be carried out in the built environment, therefore no direct impact on biodiversity is anticipated due to civil works. However, adverse impacts are anticipated if aquaculture activities planned in natural or critical habitats. The project will also support dissemination of genetic material for animals, fish and fodder which could lead to risks associated with intentional or accidental invasive species.</p>	<p>groups and clear procedures for negotiated settlement. Does not include provisions for compensation of displaced persons without titles or recognizable rights to land. Does not require preparation of Resettlement Plans / Framework. Does not require for compensation or entitlements to be paid before physical or economic displacement. No provision for monitoring of resettlement activities.</p>
		<p>Adverse impact on freshwater lakes and rivers in the project area is also anticipated due to water pollution and waste generation from aquaculture activities.</p>	
		<p>This ESMF ensures that no activity shall be carried out in the natural or critical habitat and avoid the intentional or accidental introduction of invasive alien species to avoid any</p>	

Environmental and Social Standard	Description	Relevance to the Project	Identification of Gaps in the context of local laws
ESS8 – Cultural Heritage	ESS8 recognizes the importance of cultural heritage as a valuable source of scientific and historical information, as an economic and social asset for development, and as an integral part of people's cultural identity. This standard sets out measures to protect cultural heritage throughout the lifecycle of the project.	risks of destroying native species. It also ensures conservation of biodiversity in project area especially species of conservation concern.  The project activities planned under the project are not anticipated to directly impact any cultural heritage site. The project investments include civil works related excavation, therefore ESMF will include chance find procedures and screening checklist which will guide handling of cultural heritage discovered during commencement of Project.	The provincial legislation is silent regarding the Development of Physical Cultural Resource Management Plan. There is no provision related to tangible and intangible cultural properties. The provincial legislation is silent about the disclosure of information regarding cultural heritage due to the safety or integrity of the cultural heritage or would endanger sources of sensitive information from public disclosure.
ESS10 – Stakeholder Engagement and Disclosure	This standard recognizes the importance of open and transparent engagement between the Client and project stakeholders as an essential element of good international practice. The objectives of ESS10 are to establish a systematic approach to stakeholder engagement that will build and maintain constructive relationships, assess the level of stakeholder interest and support for the project, and to enable stakeholders' views to be taken into account in project design and E&S performance. It also provides guidance on promoting and providing means for effective and inclusive stakeholder engagement throughout the life of the project.	Relevant. Effective stakeholder engagement and information disclosure are crucial to the functioning of any project. As per ESS10 guidance, a separate Stakeholder Engagement Plan (SEP) will be prepared by the implementing agency. The SEP will focus on identification of and engagement with directly affected parties, other interested parties and vulnerable groups. The SEP will provide guidance for Project implementers on how to meaningfully engage with these groups through the Project lifecycle. The SEP will also include a grievance redress mechanism (GRM) to receive and facilitate the resolution of concerns and grievances including SEA/SH incidents.	Local laws address most of the requirements of the ESS-10. However, major identified gaps are as below:  There is no provision for the preparation of Stakeholder Engagement Plan/Framework. Stakeholder identification and analysis in public sector development projects is not done effectively, especially the involvement of third party. There is no proper mechanism to record and handling of grievances as provided in ESS-10.

The relevant policies to project other than ESSs are described in Table 3.

Table 3 Applicability of World Bank Policies

Sr. No.	WB Safeguard Policies Triggered by the Subproject	Triggered		Explanation
		Yes	No	
1.	The World Bank OP 7.50 Projects on International Waterways	[√]	[]	The policy is applicable to the project as some of the Project's activities are likely to involve the use of water from the Indus River, which is considered an international waterway as defined in paragraph 1 of the Policy. The Project involves the upgrading of existing aquaculture systems to increase productivity and production in a climate-smart way, as well as, in some cases, the development of new aquaculture ponds, which will take water from irrigation water channels, fed indirectly by the Indus River through primary, secondary, or tertiary canals and farm channels. This support is expected to reach approximately 100 producer groups. The impacts of modernizing or developing such existing aquaculture systems for this limited number of producer groups would be minimal on the quantity and quality of water in the international waterway and these aquaculture schemes would also not be adversely affected by

Sr. No.	WB Safeguard Policies Triggered by the Subproject	Triggered		Explanation
		Yes	No	
				other riparian's possible water use. Therefore, as per advise from LEGEN, exception to the notification requirement under paragraph 7 (a) of the Policy is obtained and that riparian notification is not required.
2.	The World Bank OP 7.60 Projects in Disputed Areas	[ ]	[√]	NA

### 3.3. Obligations Under International Treaties

Pakistan is signatory to several multilateral environmental and social agreements. The proposed Project is obliged to respect the applicable agreements, which are provided in the following sections.

#### Environmental Obligations

- Paris Agreement, 2015.
- Stockholm Convention on Persistent Organic Pollutants, 2004.
- Vienna Convention, 1985.
- Convention on Conservation of Migratory Species of Wild Animals, 1979.
- UNESCO Convention on the Protection of the World’s Cultural and Natural Heritage, 1972.
- Convention on Biological Diversity (CBD), 1994.
- United Nations Framework Convention on Climate Change (UNFCCC), 1992.
- Kyoto Protocol, 1992.
- The Rio Declaration, 1992.
- Montreal Protocol 1987.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1975.

#### Social Obligations

- Convention for Safeguarding the Intangible Cultural Heritage, 2003.
- Convention on the Rights of the Child, 1989.
- Convention on the Elimination of all Forms of Discrimination against Women, 1979.
- International Covenant on Civil and Political Rights, 1966.
- International Covenant on Economic, Social and Cultural Rights, 1956.
- International Labor Organization (ILO) Conventions – Ratified by Pakistan<sup>9</sup>
- C138 - Minimum Age Convention, 1973 (No. 138).
- C111 - Discrimination (Employment and Occupation) Convention, 1958 (No. 111).
- C107 - Indigenous and Tribal Populations Convention, 1957 (No. 107).
- C029 - Forced Labor Convention, 1930 (No. 29).

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<sup>9</sup> The Pakistan has ratified 36 ILO’s conventions (At present, 31 are enforced) including its eight Core Conventions covering four areas, namely; child labor, forced labor, discrimination, right of freedom of association and to bargain collectively - (All ILO Conventions are available at ILO’s website at <https://www.ilo.org/global/lang--en/index.htm>)

- C001 – Hours of Work (Industry) Convention, 1919 (No. 1)

## 4. Environmental and Social Baseline

This chapter provides an overview of the baseline environmental and socioeconomic conditions the project areas. This baseline has been prepared based upon the secondary literature resources.

### 4.1. Physical Environment

#### 4.1.1 Geography

Geographically Sindh is the third largest province of Pakistan, stretching about 579 km from north to south and 442 km (extreme) or 281 km (average) from east to west, with an area of 140,915 square kilometers (54,408 square miles) of Pakistani territory. Sindh is bounded by the Thar Desert to the east, the Kirthar Mountains to the west, and the Arabian Sea in the south. In the center is a fertile plain around the Indus River<sup>10</sup>.

#### 4.1.2 Geology

The prevailing geologic conditions in the region are the results of extensive inundation, depositions, coastal movements, and erosions over a long period of time in the geological ages. The geology of the region is closely related to the formation process of Himalayan ranges resulting in intense deformation with complex folding, high angle strike-slip faults and crust thickening expressed in a series of thrust faults. The important tectonic changes which have had so much influence in the region are feebly visible, particularly in the Indus Plain, and it is only by considering the geology on a broader regional scale, as well as in site-specific detail, that the effects can be appreciated. Most parts of Sindh are covered either by recent alluvium or wind-borne sand. The principal features of geological significance are to be found in the hilly portions of the province, towards the west of the Indus. Outlying extensions of this hilly tract occur east of the Indus as well, near Sukkur, Hyderabad and Jerruck. The isolated hills of Nagarparkar on the northern border of the Rann of Kutch belong to quite a different system both geographically and geologically<sup>11</sup>.

#### 4.1.3 Topography

Topographically, Sindh can be divided into four distinct parts: (a) Kirthar range on the west; (b) a central alluvial plain bisected by the Indus River; (c) a desert belt in the east; and (d) the Indus delta in the South. These are briefly described below.

- a) Kirthar Range is consisting of three parallel tiers of ridges that run in the north south direction and vary in width from 20 to 50 km. The Kirthar range has little soil and is mostly dry and barren.
- b) Central Alluvial Plain is comprising the valley of the Indus River. This plain is about 580 kilometers long and about 51,800 square km in area and gradually slopes downward from north to south. It is a vast plain, around 100 meters high above sea level. According to the past tradition, it has been divided into three distinct zones: i)

<sup>10</sup> <https://slmdc.com.pk/content/geography.html>

<sup>11</sup> *Sindh Water and Agriculture Transformation (SWAT) Project, ESMF, 2022*



Lar or Southern Sindh comprising the area south of Hyderabad; ii). Wichalo or Central Sindh, the area, lying immediately around Hyderabad; and iii) Siro, or Northern Sindh, comprising the area beyond Naushahero Feroze and Sehwan.

- c) Eastern Desert Belt including low dunes and flats in the north, the Achhrro Thar (white and desert) to the south and the Thar Desert in the south-east. There is a small hilly tract known as the Karunjhar hills. The Aravalli series belongs to the Archaean system, which constitutes the oldest rocks of the earth's crust.
- d) Indus Delta is consisting of the distributaries of the Indus River, which starts spreading out near Thatta across the deltaic flood plain in the sea. The even surface is marked by a network of flowing and abandoned channels. A coastal strip, 10 to 40 km wide, is flooded at high tide and contains some mangrove swamps.

#### **4.1.4 Soil**

The soil in the plains of Sindh is plastic clay that has been deposited by the Indus. Combined with water it develops into a rich mould and without water it degenerates into a desert. Nearly the entire Indus valley has soil which is extremely friable and easily disintegrated by the flow of water. Resultantly, the water always contains a large amount of suspended silt.

Salinity is one of the major soil problems confronting agriculture in Sindh. The problem is generally considered to be the result of the canal irrigation system, but countrywide soil surveys have established that most of the existing saline/saline sodic soils are not related to the present irrigation system, and their formation is the consequence of the gradual redistribution of salts already present in the soil.

#### **4.1.5 Land Use**

Agriculture, followed by forestry, is the main land use in most parts of Sindh. Although more than 50 percent of the total geographical area is cultivable, only about 26 percent of it is actually located in the central plain. The land inside the Indus embankments is almost equally employed by agriculture and forestry, while that outside the embankments is more extensively utilized for agriculture in the form of sparsely distributed irrigated plantations<sup>12</sup>.

#### **4.1.6 Water Resources**

The primary source of water available to Sindh is the Indus River and its tributaries. The river provides water for irrigation, domestic use and industrial purposes. Water from Indus River is regulated through three Barrages; Guddu barrage, Sukkur barrage and Kotri barrage. The province also has significant groundwater resources, which are mainly used for domestic and industrial purposes although ground water is generally brackish, except near the canals and the Indus. The groundwater is extracted from wells and tube wells, particularly in the arid regions of the province. The province also has several lakes and reservoirs that contribute to the water supply, particularly for domestic and industrial purposes. The major lakes include the Keenjhar Lake, Manchar Lake, Haleji Lake, and the

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<sup>12</sup> Sindh Water and Agriculture Transformation (SWAT) Project, ESMF, 2022

Hadero Lake. Canal water is the primary source of water supply in the project area. Majority of canal water is used for irrigation purposes, then domestic and then industrial purpose. In most areas of Sindh, groundwater needs to be mixed with canal water before it can be effectively utilized for agricultural purposes.<sup>13</sup>

The available groundwater resource in Sindh is about 5-million-acre foot (MAF) and has ample potential for irrigation however, the use of groundwater is comparatively lesser (4.3 billion cubic meter) than surface water because of two primary reasons: firstly, most of the area is lying on saline or brackish water; secondly, canal command areas are being provided with surface irrigation supplies. The river Indus, having an influent behavior, loses water to the underlying aquifer, as it lies on a slight ridge, which slopes away in a lateral direction up to Larkana District.<sup>14</sup> A part of the flow drains towards the desert in the east, whereas the other flows towards the Kirthar Hills. During the harvest season of winter crops, the flow in the river below Sukkur Barrage becomes negligible, so the river starts receiving groundwater, especially from the left bank.

#### 4.1.7 Climate

Sindh is divided into three climatic regions: Siro (the upper region, centred on Jacobabad), Wicholo (the middle region, centred on Hyderabad), and Lar (the lower region, centred on Karachi). The thermal equator passes through upper Sindh, where the air is generally very dry. Central Sindh's temperatures are generally lower than those of upper Sindh but higher than those of lower Sindh<sup>15</sup>. Dry hot days and cool nights are typical during the summer. Central Sindh's maximum temperature typically reaches 43–44 °C (109–111 °F). Lower Sindh has a damper and humid maritime climate affected by the southwestern winds in summer and northeastern winds in winter, with lower rainfall than Central Sindh. Lower Sindh's maximum temperature reaches about 35–38 °C (95–100 °F). In the Kirthar range at 1,800 m (5,900 ft) and higher at Gorakh Hill and other peaks in Dadu District, temperatures near freezing have been recorded and brief snowfall is received in the winters.

Compared to other provinces, Sindh is especially vulnerable to climate change given its terrain and topography. Floods are a principal hazard in Sindh as demonstrated by the devastating floods in 2010, 2011, 2012 and 2013 and in September 2022. Flash floods triggered by heavy rains caused widespread destruction across vast areas of Sindh. Due to the lack of resilient infrastructure, these natural calamities have also impacted lives, and livelihoods and disrupted access and connectivity between districts and rural communities.

## 4.2. Ecological Environment

### 4.2.1 Ecologically Sensitive Areas

Pakistan has a total of 431 Protected Areas out of which 50 are situated in Sindh, consisting of 01 National Park, 33 Wildlife Sanctuaries and 16 Game Reserves. Regarding waterbodies Sindh province has the Indus River (with Guddu barrage, Sukkur Barrage and Kotri

<sup>13</sup> *Sindh Water Policy, 2023*

<sup>14</sup> Talib, M. A., Tang, Z., Shahab, A., Siddique, J., Faheem, M., & Fatima, M. (2019). Hydrogeochemical Characterization and Suitability Assessment of Groundwater: A Case Study in Central Sindh, Pakistan. *International journal of environmental research and public health*, 16(5), 886. <https://doi.org/10.3390/ijerph16050886>

<sup>15</sup> *Sindh Climate Change Policy, 2022*

Barrage), freshwater and brackish water lakes (Nara Wetland Complex, Karoonjhar Dam, Runn of Kutch, Indus Delta, Nurruri Lagoon, Pateji Lake and Shakoore Dhand), and a network of irrigation and drainage canals (like Ghotki feeder canal, Raineer Canal, Nara Canal, Khairpur West and East Feeder Canals, Rhoori Canal, Right Bank Out Drain Canal, and Left Bank Out Drain Canal)<sup>16</sup>. Out of the total wetlands in Sindh ten have been declared as Ramsar Sites. Most of these wetlands, particularly the Indus Delta and coastal wetlands face issues like reduced flow of freshwater, pollution, deforestation, encroachment, illegal hunting, poaching, and fishing. Table 4 enlists Ramsar sites in Sindh province.

**Table 4 Ramsar Sites in Sindh Province**

Sr. No.	Wetlands	Location	Area (ha)
1	Deh Akro Wetland Complex	Shaheed Benazirabad	20243
2	Drigh Lake	Larkana	164
3	Haleji Lake	Thatta	1,704
4	Hub Dam	Karachi	27,000
5	Indus Delta	Thatta and Badin	472,800
6	Indus Dolphin Reserve	Sukkur Barrage to Guddu Barrage	125,000
7	Jabho Lagoon	Sujawal	706
8	Keenjhar Lake	Thatta	13,468
9	Nurri Lagoon	Badin	2,540
10	Rann of Kutch	Badin / Tharparkar	566,375

## 4.2.2 Biodiversity

### Flora

Four major forest types fall in Sindh Province; 1). Littoral and Swamp forests; 2). Tropical thorn forests; 3). Riverine forests, and; 4). Irrigated Plantations. Distribution, area and key flora of these forests are given in the Table 5 below.

**Table 5 Forest Type Wise Key Flora<sup>17</sup>**

Sr. No.	Forest type	Location	Total Area (ha)	Key Flora
1.	Littoral and Swamp forests	Karachi, Thatta, Badin, Sujawal districts	600,000	<i>Avicennia marina</i> , <i>Rhizophora mucronate</i> , <i>Ceriops tagal</i>
2.	Tropical thorn forests	Almost all districts of Sindh	42,167	<i>Prosopis cineraria</i> (Jhand), <i>Capparis decidua</i> (Karir, Karil), <i>Zizyphus mauritiana</i> (Ber), <i>Tamarix aphylla</i> (Farash), <i>Salvadora oleoides</i> (Pilu, wan), <i>Euphorbia</i> (Thor), <i>Nannorrhops ritchiana</i> (Mazri)
3.	Riverine forests	Along the banks of Indus River and its tributaries in Thatta, Hyderabad, Dadu,	241,198	<i>Saccharum bengalense</i> , <i>Saccharum spontaneum</i> , <i>Tamarix dioica</i> , <i>Tamarix indica</i> , <i>Populus</i>

<sup>16</sup> Ghalib, S.A. et al. (2018) 'Review of the distribution, status and conservation of the wildlife of Sindh', Canadian Journal of Pure and Applied Sciences, 12(2), pp. 4519-4533.

<sup>17</sup> Source: Siddiqui 1997; WWF-Pakistan 2008; Javed 2019; Sindh Forest Department 2023

Sr. No.	Forest type	Location	Total Area (ha)	Key Flora
		Larkana, Naushero Feroze, Nawabshah, Khairpur, Sukkur, Shikarpur, Ghotki and Jacobabad Districts.		<i>euphratica</i> , <i>Acacia nilotica</i> , <i>Prosopis cineraria</i> , <i>Cynodon dactylon</i> , <i>Prosopis cineraria</i> , <i>Salvadora persica</i> , <i>S. oleoides</i> , <i>Capparis decidua</i> , <i>Acacia senegal</i> , <i>A. jacquemontii</i> .
4.	Irrigated Plantations	Jacobabad, Shikarpur, Larkana, Sukkur, Khairpur, Hyderabad districts	82,195	<i>Acacia nilotica</i> (Babul), <i>Eucalyptus</i> spp. <i>Dalbergia sisoo</i> (Talhi or Shisham), <i>Salmalia malabarica</i> (Simal) and <i>Conocarpus</i>

Due to several climatic and anthropogenic causes the natural forest ecosystems and their native flora are under extreme pressure. Though some areas have been afforested/ reforested through plantation, generally there is deforestation and forest degradation in natural forests of Sindh Province. During the period 2016-2020 the total deforestation and forest degradation were reported as 26,976 ha (6,744 ha/ year) and 15,712 ha (3928 ha/ year) respectively (MoCC and WWF-Pakistan, 2022). Five of the local plant/ tree species have been identified as species of conservation concern, that need to be protected and conserved (Table 6).

**Table 6 Plant Species of Conservation Concern<sup>18</sup>**

Sr. No.	Common Name	Scientific Name	Conservation status
1.	Gugul	<i>Commiphora wightii</i>	Critically endangered
2.	True Mangrove/ Timer	<i>Rhizophora mucronata</i>	Decreasing
3.	French grass/ Hazar Dani	<i>Euphorbia prostrata</i>	Least concern (decreasing)
4.	Indian poplar, Euphrates poplar/ Bhan, Bahan	<i>Populus euphratica</i>	Least concern (decreasing)/ Fast decreasing in Pakistan
5.	White Mangrove/ Timer	<i>Avicennia marina</i>	Least concern (decreasing)

## Fauna

Pakistan has rich biodiversity with 195 species of mammals (06 endemic), 668 species of birds (25 endemic), 177 species of reptiles (13 endemic) and 22 species of amphibians (09 endemic) (Government of Pakistan 2019). Out of these 82 species of mammals 420 species of birds, 103 species of reptiles and 07 species of amphibians are found in Sindh<sup>19</sup>.

Key species of the mammals found in Sindh Province are: Sind Wild Goat (*Capra aegagrus*), Urial (*Ovis vignei*), Chinkara (*Gazella bennettii*), Hog Deer (*Axis porcinus*), Hyaena (*Hyaena hyaena*), Wolf (*Canis lupus*), Leopard, (*Panthera pardus*), Caracal (*Felis caracal*), Honey Badger (*Mellivora capensis*), Pangolin (*Manis crassicaudata*), Fishing Cat (*Prionailurus viverrinus*), Desert Fox (*Vulpes vulpes*), Indus Dolphin (*Platanista minor*), Humpbacked or

<sup>18</sup> Source: Pakistan National Biodiversity Strategy Action Plan, MoCC 2017; Biodiversity Management Plan, MNFSR 2021

<sup>19</sup> Ghalib, S.A. et al. (2018) 'Review of the distribution, status and conservation of the wildlife of Sindh', Canadian Journal of Pure and Applied Sciences, 12(2), pp. 4519-4533.

Plumbeous Dolphin (*Sousa plumbea*) and Bottlenosed Dolphin (*Tursiops truncatus*) (Ghalib et al., 2018). Key species of birds are: Indian Peafowl (*Pavo cristatus*), Sarus Crane (*Grus antigone*), Houbara Bustard (*Chlamydotis undulata*), Marbled Teal (*Marmaronetta angustirostris*), Grey Partridge (*Francolinus pondicerianus*), Chakur (*Alectoris chukar*) and Shaheen Falcon (*Falco peregrinus*) (Ghalib et al., 2018; MNFSR, 2021)

Key species of Reptiles of Sindh are: Marsh Crocodile (*Crocodylus palustris*), Green Turtle (*Chelonia mydas*), Olive Ridley Turtle (*Lepidochelys olivacea*), Indian Python (*Python molurus*), Desert Monitor (*Varanus griseus*) and Spinytailed Lizard (*Saara hardwickii*). These species are under threat except Marsh Crocodile which is quite common in its habitat (Ghalib et al., 2018; MNFSR, 2021).

Key wildlife species of conservation concern and their protection status under the Sindh Wildlife Protection Act are provided in Annex-A.

### Fish Fauna

Sindh province has the richest fish diversity of the country. The province has 400 commercially important species of the marine fish, 200 species of fresh water fish and 13 species of shrimp (GoP, 2019). Key fish species include Dwarf snakehead (*Channa gachua*), Spotted snakehead (*Channa punctata*), Giant snakehead (*Channa marulius*), Stripped snakehead (*Channa striata*) Indus baril (*Barilius modestus*), Indus garua (*Clupisoma naziri*), Rita catfish (*Rita rita*), Giant catfish (*Arius thalassinus*), Spadenose shark (*Scolidon laticaudus*), Sind sardinella (*Sardinella sindensis*), Goldstripe sardinella (*Sardinella gibbosa*) and Toil shade (*Tenualosa toli*), Palla fish (*Tenualosa ilisha*), , Rohu (*Labeo rohita*), Thela/theri Fish (*Catla catla*), Dahi (*Labeo calabasu*), Indian river shad (*Gudusia chapra*), Dwarf gourami (*Colisa lalia*), Banded gourami (*Colisa fasciata*), Chanda nama, Butter Catfish (*Ompok bimaculatus*), Pabdah Catfish (*Ompok pabda*), Freshwater Shark/Malli (*Wallago attu*), Singari (*Macrones aor*) and Marakho (*Catla buechanani*) (SFD, 2019; WWF-Pakistan, 2008; WWF-Pakistan 2011; MoCC 2017, MNFSR 2021).

According to the Pakistan National Biodiversity Strategy Action Plan, MoCC 2017 the government of Pakistan has declared a total of 16 fish species of special conservation concern out of which 13 are found in Sindh Province (Table 7).

**Table 7 Fish Species of Conservation Concern<sup>20</sup>**

Sr. No.	Common Name	Scientific Name	Distribution
1	Golden Mahasheer	<i>Tor putitora</i>	AJK, KP, Punjab, Balochistan
2	Butter Catfish	<i>Ompok bimaculatus</i>	KP, Punjab, Sindh
3	Pabdah Catfish	<i>Ompok pabda</i>	AJK, KP, Balochistan, Punjab, Sindh
4	Freshwater Shark/Malli	<i>Wallago attu</i>	AJK, Balochistan, KP, Sindh, Punjab
5	Gangetic Ailia	<i>Ailia coila</i>	Punjab, Sindh
6	Humped Featherback	<i>Chitala chitala</i>	Punjab, Sindh
7	Gangetic Goonch	<i>Bagarius bagarius</i>	Punjab, Sindh

<sup>20</sup> Source: Pakistan National Biodiversity Strategy Action Plan, MoCC 2017; MNFSR 2021

Sr. No.	Common Name	Scientific Name	Distribution
8	Himalayan Snow Trout	<i>Schizothorax plagiostomus</i>	AJK, GB, KP, Punjab, Balochistan
10	Zebrafish	<i>Danio rerio</i>	KP, Punjab, Sindh
11	Bengala Barb	<i>Megarasbora elonga</i>	KP, Punjab, Sindh
12	Whiptail Catfish	<i>Sisor abdophorus</i>	Punjab, Sindh
13	Gangetic Leaf fish	<i>Nandus nandus</i>	Punjab, Sindh
14	Chameleon Fish	<i>Badis badis</i>	Punjab, Sindh
15	Gangetic Mud Eel	<i>Monopterusuchia</i>	Punjab, Sindh
16	One-stripe Spiny Eel	<i>Macrognathus aculeatus</i>	Punjab, Sindh

Allien exotic warm water fish species introduced in the Pakistan including Sindh province for the purpose of sports hunting, yield enhancement and biological control of aquatic weeds and mosquitoes (Table 8). These species due to potent reproductive potential and feeding competitions pose threats to native fish fauna (Rafique & Khan, 2012). In some case these species are reported to escape in to the natural water bodies (Rivers and Lakes) including canals. Moreover, due to use of unsustainable and illegal fishing practices (application of electric current, use of chemicals, dynamites etc.), reduced freshwater flow in rivers (safe environmental flow) and pollution fish production in natural water bodies has reduced drastically. These have further led to negative impacts on livelihoods of fishermen communities especially the fishermen Communities who are mainly dependent on fishery resources for their livelihoods.

**Table 8 Alien Exotic Fish Species Introduced in Sindh**

Sr. No.	Common Name	Scientific Name
1	Grass carp	<i>Ctenopharyngodon idella</i>
2	Bighead carp	<i>Hypophthalmichthys nobilis</i>
3	Silver carp	<i>Hypophthalmichthys molitrix</i>
4	Common carp	<i>Cyprinus carpio</i>
5	Gold fish	<i>Carassius auratus</i>
6	Tilapia	<i>Oreochromis aureus</i> ,
7	Tilapia	<i>Oreochromis mossambicus</i> ,
8	Tilapia	<i>Oreochromis niloticus</i>

### 4.3. Socioeconomic Conditions

#### 4.3.1 Demography

The total population of Sindh Province is recorded as 47,854,510 in Census-2017 as compared to 30,439,893 in Census-1998. The population has increased by 57.21% since Census-1998, with an average annual growth rate of 2.41% during the intercensal period of

1998-2017. The rural population of Sindh Province is 23,021,876, which is 48.11% of total population, whereas the urban population is 24,832,634, with a share of 51.89% of total population of Sindh. Average household size in Sindh is 5.58 persons<sup>21</sup>.

#### **4.3.2 Administrative Profile**

Administratively, Sindh consists of six divisions: Karachi, Hyderabad, Sukkur, Mirpurkhas, Larkana, Shaheed Benazir Abad. Each division comprises districts, of which there are a total of 29. These districts are further subdivided into 138 talukas. Karachi, the provincial capital of Sindh, is the largest city in Pakistan and the main contributor to the national Gross Domestic Product (GDP). The province is the most urbanized and industrialized in the country, with a mixed economy ranging from heavy industry and finance to commercial agriculture. It is also strategically located on the coast and carries 95 percent of Pakistan's external trade. Whereas financial and industrial sectors of the province are concentrated in the provincial capital of Karachi, the main agricultural base is found along the Indus River. The agriculture sector's share in total employment is 35.8 percent.

#### **4.3.3 Religious Minorities**

The majority of the population of the Sindh province is Muslim. Although, 90.34% of the total population declares Islam as their faith, the province has still relatively higher proportion of minorities living in it. The largest community amongst minorities is Hindu, which constitute 6.99% of the total population followed by Scheduled Castes i.e., 1.74% of total population reported in Census-2017.<sup>22</sup>

#### **4.3.4 Economy**

Sindh is one of the richest provinces of Pakistan. Its share in the national gross domestic product (GDP) is estimated at around 30% while its share in the population is around 23%. Pakistan's economy has recently grown at approximately 4.7% per year; Sindh enjoys a similar growth rate and contributes to national growth. The GDP per capita for Sindh is PKR 159,678, above average for the country. A rapidly growing population will affect Sindh's ability to expand the labor force and improve economic performance.<sup>23</sup>

#### **4.3.5 Irrigation**

Sindh is mainly a dry region and is relatively more arid than the upcountry areas. Irrigation is therefore critical for agriculture in the province, as the contribution of rain towards crop water requirements is negligible. About 75 percent of the agricultural land of Sindh is cultivated through a controlled irrigation system. The three major barrages on the Indus River in Sindh divert approximately 48 million acre-feet (MAF or 59.0 billion cubic meters-BCM) of water annually to the 14 main canal commands in the province. There are 13 existing surface drainage systems in Sindh, which serve a total area of over 6.2 million acres (2.5 million hectares). In addition, there are two sub-surface drainage systems, which serve an area of 0.10 million acres (0.04 million ha), which is 2 percent of the irrigated

<sup>21</sup> *Development Statistics of Sindh 2019, Sindh Bureau of Statistics*

<sup>22</sup> [http://www.healthpolicyplus.com/ns/pubs/7194-8353\\_SindhPakistanRAPIDBooklet.pdf](http://www.healthpolicyplus.com/ns/pubs/7194-8353_SindhPakistanRAPIDBooklet.pdf)

area. However, the Sindh drainage system is neither contiguous nor integrated, and waterlogging is widespread due to high surface water delivery.

#### 4.3.6 Agriculture

The total land area in Sindh is 14.1 million hectares (ha). The cultivated area (includes net area sown and fallow) is 5.18 million ha, forest area is 1.03 million ha, culturable waste 1.60 million ha (\*Culturable Land includes land available for cultivation. Out of the total cultivated area, the net area sown is 2.38 million ha, whereas fallow land is 2.80 million ha, which is the highest in the country. Shortage of water, water logging and salinity are primary reasons for land being fallow.<sup>24</sup>

Major crops grown in Sindh are rice, cotton, wheat, and sugarcane. Wheat occupies the largest cropped area (2,693,000 acres), followed by rice (2,047,000 acres) and cotton (1,512,000 acres)<sup>25</sup>. Minor crops that are grown include bananas, mangoes, citrus, vegetables and oilseeds. Livestock rearing is also an important livelihood strategy for many farming communities in Sindh.

Overall, the average farm size in Sindh is small. The Agriculture Census 2010 gives a district-wise breakdown of land holding sizes in different brackets. Based on the data in the Census, 82 percent of farms fall into the brackets of up to 12.5 acres with overall farm area under this category only 37 percent. Medium and large landholdings are limited, but their overall farm area is more.

#### 4.3.7 Livestock and Aquaculture

Livestock and Aquaculture are among the most important sectors of Sindh province. The livestock sector in Sindh accounts for more than 50% of the provincial agriculture GDP and 14.36% of the national GDP. The total livestock and poultry population in Sindh is 32.168 million and 14.136 million respectively<sup>26</sup>. Sindh Province alone hosts approximately 20 percent of the national cattle and buffalo population, and 19 percent of small ruminants. At global level Pakistan has significant position with respect livestock and animal products; 1). the third largest milk producer, 2). the third largest producer of small ruminants' meat, 3), the 11th largest poultry producer, and; 4). has the world's fifth largest cattle and buffalo herd<sup>27</sup>.

Similarly, the province has the largest share in aquaculture farms having approximately 7,010 farms (210 government-owned and 5,000 private farms), comprising about 71% of Pakistan's total aquaculture farms<sup>28</sup>. A total of 103,418.70 km<sup>2</sup> is suitable of inland aquaculture activities (with 33,515.20 km<sup>2</sup> moderately suitable, 69,751.30 km<sup>2</sup> suitable and 152.2 km<sup>2</sup> highly suitable).

<sup>24</sup> Land Utilization Statistics 2013-2014, PBS

<sup>25</sup> Agriculture Marketing Information Service 2018-2019

<sup>26</sup> Sindh Statistics. 2022. Karachi: Sindh Bureau of Statistics

<sup>27</sup> World Bank. 2023. "Project Appraisal Document (PAD) For Sindh Livestock and Aquaculture Sectors Transformation Project (P179003)". Islamabad: World Bank.

<sup>28</sup> Pakistan Aquaculture Atlas. 2023. <https://www.longline.co.uk/site/aboutus/about/>. London: Longline Environment; Verbal communication with the Sindh L&F Department officials



In addition to domestic and national consumption livestock and fisheries are among the good sources of exports earnings in Pakistan and Sindh province has a good share in these earnings. In 2019 Pakistan's export earnings from livestock and fisheries (live animals and products) were about US\$862 million (3.7 percent of the total export earnings). In addition, export earnings from hides and skins constituted another US\$861 million in 2019, or 3.6 percent<sup>29</sup>.

Despite these strengths, potentials and good agroclimatic conditions, Pakistan in general and Sindh province in particular face several problems and constraints limiting the utilization of full potential of both the livestock and aquaculture sectors such as; 1). Limited scale of production and farm aggregation narrowing down the profit margin, 2). Limited capacities and limited access to inputs and services; 3). Limited capital and limited access to financing institutions, and; 4). Natural hazards such droughts and floods.

#### 4.3.8 Role of Women

Women play a major and growing role in the livestock and aquaculture sectors in Sindh and their position in production could be strengthened. In Sindh, approximately 31 percent of women depend on livestock as a source of livelihood. Livestock management is primarily dependent on women, with daily livestock care and the processing and marketing of milk being the main occupation of rural women. For instance, women in Sindh spend 44 percent of their working time on livestock, 12 percent on crop agriculture, and the rest on other tasks including handicraft.<sup>30</sup> Women usually manage small dairy farms (3-5 animals) and are primarily in charge of milk processing.<sup>31,32</sup> Women's role in fisheries and aquaculture is often greatest in the post-harvest stages, such as cleaning, processing, and distribution of the catch.<sup>33</sup> Barriers such as social norms, lack of access to information and credit, low literacy, household and childcare duties, and restricted mobility limit women's participation in both the livestock and aquaculture sectors, resulting in women's lower productivity and income. Most milk marketing is done by men, due to limited mobility options for women, male-dominated dairy cooperatives and milk collecting centers,<sup>34</sup> and social norms that perceive women's primary role as homemakers or their labor as inferior and leave women at risk of exploitation.

The low participation of women in farming-related decision-making processes further deprives women producers from accessing innovations, extension services, entrepreneurship training, and technologies, which ultimately limits their potential to grow and increase their incomes in livestock and aquaculture. Social factors have also led to a lack of voice and agency among women farmers regarding access to natural as well as

<sup>29</sup> World Bank. 2023. "Project Appraisal Document (PAD) For Sindh Livestock and Aquaculture Sectors Transformation Project (P179003)". Islamabad: World Bank.

<sup>30</sup> Bellinguez, A., and Menon, J. (2022); Bhutto, A.L., Bhutto, B., Chandio, R.A., Bhatti, I.P., Khooharo, A.A. (2015): A perspective on household dairy farming in district Thatta, Sindh Pakistan. *Pakistan J. Agric. Agric. Eng. Vet. Sci.* 31, 127–138.

<sup>31</sup> Government of Sindh, Social Assessment Report, Livestock & Fisheries Department

([http://www.livestocksindh.gov.pk/documents/sagpl/Social\\_Assessment\\_Report\\_final.pdf](http://www.livestocksindh.gov.pk/documents/sagpl/Social_Assessment_Report_final.pdf))

<sup>32</sup> Women are involved in up to 80 percent of the work of feeding and milking cattle and rural women spend 5.5 hours per day on caring for livestock, but only 50 minutes on caring for their own children (FAO, n.d.a)

<sup>33</sup> Patil et al. (2018)

<sup>34</sup> Government of Sindh (2018): Sindh Agriculture Policy (2018-2030).

financial resources. In 2018, 77 percent of agrarian women were not aware of micro-credit organization and institutions. A majority of the loans provided to women are used by male heads of households, making it difficult for women to enter agribusiness activities and to connect with formal VCs. A large income gap between men and women working in livestock<sup>35</sup> and aquaculture persists. Women earn a third of what men earn and working conditions in processing and retail are poor.<sup>36</sup> Finally, the lack of sex disaggregated data within livestock and aquaculture contributes to limited practical recommendations and policies promoting gender equality.<sup>37</sup>

#### **4.3.9 Archaeological Sites**

The Directorate General of Antiquities, Government of Sindh, declare 2200 heritage buildings and 272 archaeological sites/monuments as protected heritage under Sindh Cultural Heritage (Preservation) Act 1994, the most important of these sites is Moen Jo Daro, which is a UNESCO World Heritage Monument.<sup>38</sup>

However, the project activities planned under the project are not anticipated to directly impact any cultural heritage site. The project investments include civil works related excavation, therefore ESMF will include chance find procedures and screening checklist which will guide handling of cultural heritage discovered during commencement of Project.

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<sup>35</sup> World Bank. 2019. *Climate Smart Agriculture in Pakistan*.

<sup>36</sup> Patil et al. (2018); FAO (2010-2011): *Women in agriculture: Closing the Gender Gap*. Rome, Italy; <https://www.fao.org/publications/sofa/2010-11/en/>

<sup>37</sup> Aurat Publication & Information Service Foundation (2018): *Recommendation for Agriculture Department Socio-Economic Rights of Women Working in Agriculture in Punjab*.

<sup>38</sup> <https://antiquities.sindhculture.gov.pk/wp-content/uploads/2023/01/THE-CHANGE-REPORT.pdf>

## 5. Stakeholder Engagement, Disclosure, and Consultations

Through the Environmental and Social Standard 10 (Stakeholder Engagement and Information Disclosure), the ESF requires the timely, relevant, understandable, and accessible disclosure of project information in a way that is free of manipulation, interference, coercion, discrimination, and intimidation.

ESS10 recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation. Stakeholder engagement is an inclusive process conducted throughout the project lifecycle. When properly designed and implemented, it supports the development of strong, constructive, and responsive relationships that are important for successful management of a project's environmental and social risks.

A detailed Stakeholder Engagement Plan (SEP) has been prepared for the project to provide guidance on stakeholder engagement by defining approaches for public consultation and information disclosure through the project lifecycle. It outlines the ways in which the project team will communicate with stakeholders, and includes a mechanism by which stakeholders can raise concerns, provide feedback, and make grievances related to project activities.

The Mohana are traditional fishing communities spread across Sindh along the river Indus and major lakes. Consisting of various castes such as the Mirbahar, Mallah and Mirani, these communities have historically been known for their expertise of boating and fishing. Traditionally the primary source of livelihood for the Mohana communities in rural Sindh was inland fishing on the resource abundant lakes and rivers of the province. However, increasing environmental pressures and degradation of inland water bodies and rivers have turned these traditional fishermen into resource poor communities, with fishing and boating on natural water bodies now their secondary source of income. The decreasing natural resources to sustain the traditional fishing and boating activities of the Mohana have increased their vulnerability, hence they may be regarded as a disadvantaged group.

Disadvantaged and vulnerable groups in the SLAST project may face barriers such as exclusion from receiving project benefits due to elite capture, labor exploitation, and limited access to electricity and internet, especially in remote areas, hindering their ability to receive digital communications related to the project. Women, often confined to household roles, may experience poor mobility, restricting their participation in external engagements. Furthermore, prevalent illiteracy can impede the comprehension of written information, necessitating alternative communication methods. These challenges necessitate tailored approaches to stakeholder engagement and information dissemination.

Vulnerable groups within the communities affected by the project will be further confirmed and consulted through dedicated means, as appropriate. Description of the methods of engagement that will be undertaken by the project is provided in the following sections.

## 5.1. Summary of Stakeholder Engagement During Project Preparation

During project preparation, the team conducted extensive community consultations across 7 districts, visiting 17 villages/locations. Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) were held with 211 livestock farmers (including 85 women), and 48 aquaculture farmers, with only 3 being female. 6 Milk Producer Groups (MPGs) established under SAGP were also met. Additionally, vulnerable and disadvantaged groups such as farm labor, women, the ultra-poor, and traditional fishing communities of Mohana (Mirbahar, Mallah, Mirani caste) were consulted.

Institutional consultations involved various government authorities such as the Environmental Protection Agency, Livestock and Fisheries Department officials, the Wildlife Department of Sindh, Sindh Fisheries and Aquaculture Research Institute (SFARI), Animal Health Hospital in Jamshoro and Khairpur, District level Agriculture, Livestock and Fisheries Officers; as well as representatives from NGOs and the private sector like the Aquaculture Farmers Association and the Sindh Rural Support Organization.

## 5.2. Key Findings from Stakeholder Engagement During Project Preparation

### Aquaculture:

- Economic constraints and input utilization: the high cost of artificial feed versus natural feed, (e.g. agricultural waste/manure) highlight economic constraints and impacts growth rates and fish sizes (fish does not grow as fast or as big when using only natural feed). This suggests a need for affordable, high-quality feed solutions as well as systematic pond fertilization regimes to get maximum benefit from natural productivity. In addition, prevention of entry of wildfish into aquaculture ponds through good screening of entry and exit points (at water inlet and outlets) this will also secure stocked fish from escaping into wild. This will also ensure zero wastage of inputs.
- Gender dynamics: women's participation is limited to fishing net preparation, pointing to cultural norms that define gender roles in aquaculture and indicating potential for increased involvement in more aspects of the value chain such as backyard aquaculture and input supply to women entrepreneurs.
- Land tenure security and community organizing: the formation of the Mallah Committee in Patti Goth village, in response to potential land tenure insecurity exemplifies local organizational strategies to mitigate risks associated with lease arrangements.
- Disease prevention and health management: minor diseases like fungus are present, highlighting the need for safe disease management practices and training on health management for both fish and wildlife.
- Integrated Pest Management: the use of pesticides like Cypermethrin shows awareness of disease control, although it raises concerns about environmental and occupational health and safety practices. Most aquaculture stakeholders interviewed did not have a clear understanding of the negative impacts of pesticide application.

- Biodiversity and species management: the farming of native species alongside non-native species like Grass Carp and Silverfish indicates adaptive biodiversity management, yet there are challenges with non-native species such as the aggressive feeding patterns of Silverfish. In the case of aquaculture operations drawing water from agricultural drainage channels, the species of fish varies year to year, selected based on seasonal salinity and other water conditions.
- Challenges of seasonal ponds: the use of seasonal ponds, which do not allow fish to reach maturity, impacts the life cycle of the fish and may influence the long-term sustainability of aquaculture operations, necessitating strategies for year-round water management, through practices such as deepening of ponds to the optimum depths required for fish culture.
- Infrastructure and resource management: farmers overstock ponds, risking the health of fish. There's a need for proper stocking guidelines and infrastructure improvements to address waterlogging and salinity.
- Labor practices: employment is year-round for local labor, and labor roles tend to be caste-associated, specifically with the Mohana/Mirbahar caste, historically associated with fishing, which could both stabilize community employment, and limit diversification of employed labor.
- Integrated aquaculture and agriculture: in the village of Mando Dero, small-scale agriculture was observed alongside fish farming, particularly on the flood banks of ponds. This dual use of land highlights an integrated approach to farming, where both aquaculture and agriculture co-exist and mutually benefit each other.
- Resource dependence and vulnerability: for seasonal ponds, the reliance on intermittent water sources (e.g. agricultural drainage water during rice harvesting season) underscores vulnerability to water availability and quality, which is critical for the sustainability of aquaculture operations. In these cases, salinity of water varies based on season, year to year, as it is agricultural drainage. Water is best and most abundant during rice harvest seasons.
- Market dynamics and economic viability: the fluctuation in the selling price of fish feed and the significant monthly expenditure on feed reflects market volatility and the economic pressures on aquaculture producers in the absence of groups or associations to consolidate production. Moreover, fish are sold without proper storage, resulting in lower profits. Farmers need facilities for storage, processing and direct market access to fetch better prices.

#### **Identified Needs:**

- Access to quality feed and seed: farmers need better access to high-quality feed and seed, particularly for species like Tilapia and Catfish, to improve growth rates and sizes of fish.
- Cost-effective feed alternatives: finding cost-effective alternatives to artificial feed, which is currently prohibitively expensive for many farmers.

- Water management solutions: addressing issues of water salinity and availability, especially considering the reliance on seasonal water sources and varying salinity levels impacting fish species choices.
- Women's involvement: encouraging and facilitating greater involvement of women in aquaculture beyond current role in net preparation.
- Market access and fair pricing: assistance in accessing broader markets and achieving fair prices for their produce, potentially through collective selling or cooperatives.
- Training and capacity building: training in modern aquaculture techniques, business management, and market knowledge to enhance productivity and profitability.
- Infrastructure development: investment in infrastructure like fishponds and storage facilities, and addressing the challenges related to land ownership and lease agreement.
- Technological support: promote the use of technology for farming practices, such as hydrological surveys to inform better pond construction and maintenance.
- Access to veterinary care: facilitating access to non-toxic treatments and veterinary services to ensure fish health and move away from harmful chemicals like Cypermethrin.
- Reliable power supply: solar power solutions are needed to address power issues for running equipment like pumps / aerators for increasing productivity.
- Transportation facilities improvement: proper transportation from farm to Mandi, such as insulating the pickups used in fish transportation for maintaining cold chain and quality of fish.
- Provision of nets for fishing and training on fishing operations

## **Livestock**

- Impacts of the SAGP Project:
  - Establishment of Milk Producer Groups (MPGs) led to uniform pricing for milk, considered fair by the villagers. Prices paid by MPG were on average higher than before.
  - The SAGP project facilitated access to essential resources such as vaccines, medicines, and training, enhancing livestock management and health.
  - Members received training in various aspects of dairy production, including rearing techniques, vaccination, milk safety, and operational management of milk centers., Animal health management, Feed & Fodders and Importance of reproduction and AI
  - Introduction of solar pumps replaced manual water extraction methods, easing the water, collection process for livestock.

- The withdrawal of consistent veterinary support after the project's conclusion has left a gap in reliable animal healthcare services.
  - The project encouraged a shift towards dairy production as a sustainable livelihood, evidenced by increased milk sales and reduced animal migration.
  - The absence of grievances reported to SAGP staff suggests either contentment with project outcomes or a lack of awareness or trust in the grievance redress mechanism.
  - The SAGP project had a transformative impact on the dairy sector in the participating villages, with noticeable room for improvement in marketing, financial management, ongoing veterinary support, and expansion into additional facilities, value addition, etc.
- Resource management: There is a reliance on community resources like solar pumps and chillers for milk storage. However, challenges such as electricity shortages, non-functional equipment and the need for additional resources like generators and solar pumps have been highlighted.
  - Energy challenges and cost implications: Electricity issues are mitigated with generators, yet the high and rising diesel costs present sustainability concerns for maintaining chillers crucial for milk preservation.
  - Infrastructure deficiencies: Non-functional batteries for solar setups reflect infrastructural inadequacies, affecting nighttime operations and indicating a need for more robust, cost-effective energy solutions.
  - Collective action and market access: The establishment of MPGs has unified pricing and market access, although there is an awareness of potentially higher profits if direct access to urban markets could be achieved.
  - Capacity building and training: Training provided through projects has improved livestock rearing techniques, vaccination knowledge and milk safety. However, there is a desire for more advanced training in value addition and marketing.
  - Financial management and institutional support: Regulatory restrictions prevent the opening of bank accounts for cooperatives, leading to cash-based transactions and informal bookkeeping, highlighting a need for financial system reform.
  - Marketing and buyer access: Despite recognizing the need for effective marketing to sell to premium buyers like Nestle and Engro, there is a gap in understanding the specific quality standards and processes required beyond marketing to engage with such corporations.
  - Resilience of well-cared livestock: Animals that received proper care, including vaccinations and veterinary visits, demonstrated higher survival rates during floods compared to neglected animals.
  - Sustainability and environmental challenges: The changing climate with reduced or late rains affects the sustainability of livelihoods, indicating a need for interventions that consider environmental resilience.

- Sustainability of livestock practices: unchecked grazing and the unchecked use of hazardous drugs like Diclofenac, highlight the need for controlled grazing systems and the promotion of safe agricultural practices.
- Veterinary services and healthcare access: The distance from veterinary centers and inconsistent support post-projects suggests a gap in continuous animal healthcare provision. Moreover, there is an uneven distribution of veterinary facilities and staff and a significant livestock population puts pressure on existing resources, such as insufficient transport and refrigeration. Major diseases such as Lumpy Skin Disease, Foot and mouth disease, PPR and Congo Virus present ongoing challenges.
- Entrepreneurship and business expansion: There are examples of entrepreneurial initiatives like opening shops in nearby towns, showing a community's capacity for business expansion with proper support.
- Social structures and land rights: The informal nature of land "ownership" and community-based land allocation practices suggest a need for official documentation to secure land tenure.
- Microfinance utilization and interest concerns: While microfinance has enabled animal purchases, high-interest rates deter its use, pointing towards, a need for more farmer-friendly lending solutions.
- Tribal dynamics and business expansion: Tribal conflicts impede the expansion of business activities, such as opening milk shops in towns, indicating that social factors are significant in economic development.
- Vulnerability to natural disasters: The impact of floods on livestock, compounded by insufficient veterinary support post-SAGP, underscores the sector's vulnerability to natural disasters and the importance of robust emergency response systems.
- Livestock feed and quality of milk: The relationship between feed quality and milk production highlights the potential for income improvement through better feed and agricultural practices.
- Women's role in livestock management: Women's involvement is predominantly in livestock rearing and milking, but their direct inclusion in market activities is limited and their work remains within the domestic sphere, pointing to potential areas for gender-targeted interventions.

#### **Identified Needs:**

- *Additional solar pumps:* Many communities saw an increased demand for water as the overall proportion of households involved in livestock rearing increased following SAGP. In many cases, this necessitated additional solar pumps and water sources.
- *Enhanced marketing:* a need for better marketing strategies to connect with larger commercial buyers
- *Agricultural assistance for feed:* assistance required for local production of quality feed, reducing reliance on purchases outside the village.



- *Value addition in dairy products:* support needed to diversify into higher-value dairy products like ice cream, cheese and kulfi.
- *Local supply store (“khushali ghar”):* a local store in the village to purchase supplies such as feed and medicines, reducing the need to travel to town.
- *Reliable power supply:* solar power solutions are needed to address power issues.
- *Transportation facilities:* a need for transportation, such as an auto rickshaw with a chiller, to facilitate milk transport to towns.
- *Establishment of bank accounts:* facilitating the establishment of bank accounts for MPGs would enable better financial management, provide a more formal structure for financial operations, and enhance the economic resilience of MPGs.
- *Enhanced veterinary services:* to address insufficient transport and refrigeration facilities for disease treatment and outbreak response.
- *Community training:* education on safe medicine use, wildlife conservation and environmental stewardship to mitigate risks associated with livestock rearing.

### **5.3. Summary of Project Stakeholder Needs, Methods, Tools, and Techniques for Engagement**

The Stakeholder Engagement Plan details the engagement process, methods, including sequencing, topics of consultations and target stakeholders. The World Bank and the Borrower do not tolerate reprisals and retaliation against project stakeholders who share their views about Bank-financed projects.

#### **5.3.1 Proposed Strategy to Incorporate the Views of Vulnerable Groups**

The project will seek the views of vulnerable groups, such as small-scale farmers, women farmers, women headed households, youth, elderly, sharecroppers, religious or ethnic minorities, fishermen communities, and persons with disabilities through tailored methods of engagement. These groups will be reached through community meetings held in accessible locations, focused group discussions with gender and disability inclusivity and household surveys for those unable to attend public forums. To ensure full participation, materials will be provided in local languages and in formats accessible to the illiterate or disabled. A safe space would be created for open dialogue, especially on sensitive issues. The project will also leverage partnerships with local NGOs that have experience working with these groups to facilitate meaningful engagement.

The project will seek the views of vulnerable groups, such as small-scale farmers, women farmers, women headed households, youth, elderly, religious or ethnic minorities, and persons with disabilities through the following methods:

- *Community meetings:* organizing meetings in local communities to facilitate direct interaction and feedback.
- *Focus Group Discussions:* conducting discussions with smaller, targeted groups to delve deeper into specific issues and concerns.

- Individual Interviews: engaging in one-on-one interviews, particularly for those unable to attend group sessions.
- Terrestrial television and radio broadcasts: disseminating project information through channels with broader availability, particularly in the case of female stakeholders who may have limited modes of information access.
- Surveys: distributing written or digital surveys to gather a broader range of responses.
- Accessible workshops: hosting workshops that are physically and logistically accessible to all, including persons with disabilities.
- Social Media and Online Platforms: utilizing digital platforms for engagement, especially beneficial for tech-savvy youth and those with limited mobility.
- Collaboration with Local NGOs: partnering with NGOs that have existing relationships with these groups to facilitate engagement.

The following measures will be taken in order to remove obstacles to full and enabling participation / access to information:

- Provision of Information in Local Languages: translating materials into local dialects to ensure understanding.
- Accessible Formats: offering information in braille, large print, and audio formats for those with visual or hearing impairments, and pictorial guides and audio-based explanations for the illiterate. Additionally, ensuring the availability of printed signage and flyers for those without digital access.
- Convenient and Accessible Venues: choosing meeting locations that are easily reachable and accessible to persons with disabilities and women who may have limited mobility due to cultural norms.
- Flexible Timing: scheduling sessions at times suitable for participants, considering work and caregiving responsibilities.
- Transportation Support: arranging transportation for remote or mobility-challenged individuals.
- Cultural Sensitivity Training for Facilitators: ensuring that those leading sessions are trained in cultural sensitivity and inclusivity
- Female inclusion: ensuring enough female staff is available to hold separate sessions for women.
- Regular Updates and Feedback Mechanisms: using multiple channels, including community notice boards, to disseminate information and collect feedback.

## 6. Grievance Redressal Mechanism

A Grievance Redress Mechanism (GRM) is a system that allows not only grievances, but also queries, suggestions, positive feedback, and concerns of project-affected parties related to the environmental and social performance of a project to be submitted and responded to in a timely manner.

### 6.1. Description of Grievance Redress Mechanism (GRM)

The project will prepare a detailed GRM at effectiveness to receive, address and monitor complaints and community feedback. The GRM will follow the process provided below.

**Table 9 GRM Steps**

Step	Description of process	Timeframe	Responsibility
GRM implementation structure	<p>The structure will be integrated at provincial and local levels with clear reporting lines to the PCU.</p> <p>The GRM will be implemented by the implementing agency. A Grievance Redress Committee will be formed at the PIU, including the PCU Project Coordinator, Deputy Project Directors of the PIU, Senior safeguards Specialist of PIU, Gender Specialist of PIU, Social specialists under each DPD of the PIU, and co-opted members from relevant government departments as required. The Safeguards Expert/ Specialist at the PIU will be responsible for overall operation of the GRM and will be the Grievance Redressal Officer (GRO) of the project.</p> <p>Two sub GRCs will be formed at each directorate, separately for Livestock and Fisheries. Each Deputy Project Director shall collect the complains and involve Social expert/ Specialist will be responsible for operation of the GRM at PIU level.</p> <p>At the district level, Grievance Focal Persons will be appointed or nominated, one each for the livestock and fisheries activities of the project in each district.</p>	Continuous	PIU – for convening overall project GRM and implementation

Step	Description of process	Timeframe	Responsibility
	<p>Grievances may be recorded through the local level GFPs, or directly with the Social Specialists at the PIU.</p>		
<p>Grievance uptake</p>	<p>Grievances can be submitted via the following channels:</p> <ul style="list-style-type: none"> <li>• Toll-free telephone hotline: [include number] operated by [insert]</li> <li>• Short Message Service (SMS) to [include number]</li> <li>• E-mail to [insert]</li> <li>• In-person through the GFPs, - PIU GRCs, or the PCU GRC</li> <li>• Grievance or suggestion boxes located at all project locations</li> <li>• Online form on the L&amp;FD website</li> <li>• Postal services</li> <li>• WhatsApp number:</li> </ul> <p>Complaints can be submitted in person to the Grievance Focal Persons or via dedicated phone lines, email addresses and suggestion boxes provided at local community centres.</p>	<p>Upon submission</p>	<p>PIU GRCs</p> <p>Grievance Focal Persons</p>
<p>Sorting, processing</p>	<p>Any complaint received will be forwarded to the PCU GRO and logged in a centralized system. Grievances are then categorized and referred to the relevant GFP or GRC for resolution. Grievances will be categorized into the following complaint types: Low; Medium; and High priority.</p> <p>Low priority: these typically involve minor issues that do not significantly impact the overall project or the complainants' well-being. Examples could include minor administrative errors, delays in non-critical services, or small-scale individual grievances that can be resolved locally, with the GFP, without extensive</p>	<p>Upon receipt of complaint</p>	<p>PCU GRO</p>

Step	Description of process	Timeframe	Responsibility
	<p>intervention.</p> <p>Medium priority: these are more serious than low priority complaints but do not pose immediate or significant risks to the project's success or stakeholders' rights and interests. These might include disputes over employment terms, moderate environmental impacts, or concerns about project implementation aspects that affect a limited number of stakeholders.</p> <p>High priority: these are critical issues that require urgent attention and could significantly impact the project's success and the well-being of stakeholders. Examples could include violation of the law of the land, corruption, GBV, SEAH (sexual exploitation, abuse and harassment), community rights, significant health and safety concerns, allegations of serious environmental harm; complaints regarding minorities, differently abled persons, transgender etc.</p>		
<p>Acknowledgement and follow-up</p>	<p>Receipt of the grievance is acknowledged to the complainant by the Social Specialists at the relevant PIU via acknowledgement letter or email. Depending on accessibility, the Specialist may instruct the relevant GFP to convey acknowledgement</p>	<p>Within 5 days of receipt</p>	<p>Social Specialists at PIU</p>
<p>Verification, investigation, action</p>	<p>Low priority grievances may be investigated and resolved directly by the GFP, in consultation with the PIU GRCs. If the grievance is unable to be resolved, its priority is upgraded to medium priority.</p> <p>Medium priority grievances are investigated and resolved by the PIU sub GRCs. The GRC may enlist the relevant GFP to assist in verification and investigation. If the grievance remains unresolved, its</p>	<p>Within 10 working days for low and medium; specific timeframe for high priority set by PCU GRC</p>	<p>Grievance Focal Persons, PIU GRC,</p>

Step	Description of process	Timeframe	Responsibility
	<p>priority is upgraded to high priority.</p> <p>High priority grievances are investigated and resolved by the PIU GRC under the Project Director. The GRC may enlist PIU GRCs within the directorates, and GFPs to assist in verification and identification.</p> <p>For all levels of grievance, the proposed resolution is formulated by the overseeing entity (varying depending on the grievance priority), and the resolution is communicated to the complainant by the GRC/GFP where the complaint was first received.</p>		
Monitoring and evaluation	Data on complaints are collected in a dedicated grievance management system at the PCU GRC. Grievance data is reported to the World Bank on a quarterly basis	Quarterly reporting	PIU GRO
Provision of feedback	Feedback from complainants regarding their satisfaction with complaint resolution will be collected through follow-up surveys or interviews after the resolution process.	Post-resolution	Grievance Focal Persons
Training	<p>Training needs for staff/consultants in the PIU, Contractors and Supervision Consultants are identified and addressed through regular capacity-building workshops and on-the-job training programs, focusing on grievance redress mechanisms, social engagement and environmental compliance.</p> <p>Ongoing training for all levels of the GRM structure on handling grievances effectively and sensitively.</p>	Annually or as needed	PCIU
Appeals process	The GRM will also include a system for appeals. If a complainant is unsatisfied with the resolution of the grievance, they	Within 5 days of appeal	

Step	Description of process	Timeframe	Responsibility
	will be able to lodge an appeal, which can be escalated to the Project Director.		

As the project makes use of varying types of labor across all components, a separate GRM specifically designed for project labor has been prepared as part of the Labor Management Procedures, in line with the requirements set out in ESS2 Labor and Working Conditions.

To address any complaints related to GBV/SEA/SH, the project will ensure that GBV related grievances received by the GRM are referred to relevant GBV service providers. Dedicated trained female staff will be appointed to receive and process GBV related complaints. Special considerations will be taken to ensure that the complainant's identity is treated as privileged information, and the option to lodge the complaint anonymously will also be provided. Additionally, all GRM response teams will be trained on GBV, SEA and SH. Detailed protocols for receiving, managing and addressing complaints related to GBV/SEA/SH will be developed in the GBV/SEA/SH Action Plan and added to the GRM.

## 7. Environmental and Social Impacts and Mitigation Measures

This chapter identifies the potential environmental and social risks and impacts envisaged due to the implementation of proposed Project. The appropriate mitigation and remedial measures of each environmental and social impact are proposed in this chapter keeping in view the mitigation hierarchy, which will guide the preparation of E&S instruments of the proposed project interventions.

### 7.1. Environmental and Social Positive Impacts

- Overall, the project aims to benefit over one million farm families, SMPs, and various stakeholders in the livestock and aquaculture sectors by addressing market failures, enhancing productivity, and promoting sustainable practices. It also focuses on promoting inclusivity and resilience among beneficiaries while reducing GHG emissions and environmental impacts.
- The project will have tangible socioeconomic benefits that can be quantified either in monetary or physical terms, including: (i) increase in income of direct and indirect beneficiaries; (ii) creation of additional employment, both at the farm level and downstream in the VCs; and (iii) the increase in fiscal revenues resulting from increased turnover of the livestock and aquaculture business enterprises. The project will also have other less tangible benefits, such as increased capacity of PGs and PAs, increased share of benefits accruing to producers, increased food security, reduced vulnerability to external shocks (notably climate change and food price volatility), and so on.
- Activities financed under the project are expected to generate three main benefit streams: (i) private-level benefits, such as accrued production of livestock products (milk, dairy/small-ruminant meat) and fish due to improved feeding practices, better animal husbandry and improved genetics. Other private benefits include increased revenues from processing and commercialization of these products through the productive partnerships with buyers, which in turn generates additional social benefits in the form of increased food security and nutrition; (ii) public benefits at national and regional levels due to capacity development and institutional strengthening of the L&FD at provincial level; and (iii) global benefits, such as reduced GHG emission intensity of milk and other animal products due to good practices (e.g. feed ration balancing, animal health, reproduction management) improving production efficiency and reducing enteric and manure emissions. Other benefits, arising from the project include spill-over effects on consumers through high milk supply and quality, reduced health related illnesses through investments in food safety, and veterinary drug and feed suppliers who would receive higher demand for their services.

The environment risk rating of the project is substantial and social risk rating is assessed as moderate, giving an overall project E&S risk classification of Substantial<sup>39</sup>. Since the project

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<sup>39</sup> PAD, 2023.



footprints are not finalized at this stage therefore, it is anticipated that the activities under component 1&2 may have adverse E&S impacts.

The ESMF has accordingly assessed the potential impacts for these types of subprojects and suggests the generic mitigation measures in line with the relevant local legislation and WB ESSs. Further, with the help of appropriate mitigation and control measures, these potential impacts will either be avoided altogether, or their likelihood of occurrence and severity will be reduced, thus making these schemes environmentally responsible and socially acceptable.

Potential adverse impacts envisaged from the implementation of the proposed Project along with their proposed remedial or mitigation measures are detailed in the following sections

## **7.2. Potential Environmental Impacts and Mitigation Measures**

### **7.2.1 Technical Design and Layout Planning**

Incompatible layout plan and engineering design for construction and rehabilitation activities (under component 1 and 2) of infrastructure (office buildings, laboratories, hatcheries, research institute, veterinary units, animal sheds, milk collection center, animal sheds etc.) may put workers at risk of exposure to toxic chemicals and fumes, result in equipment failure or malfunction, leading to inaccurate results or delays in analysis. Inadequate ventilation systems, improper storage of hazardous materials, and insufficient safety measures may all contribute to a hazardous working environment. Similarly, during the construction and rehabilitation activities locals may also face problems due to temporary interruptions. The infrastructure and project workers may also potentially be impacted by natural disasters. The impact is high to medium adverse.

#### **Mitigation Measures**

- The technical design of the proposed subproject must consider all the above-mentioned factors for the final design and should meet all the relevant standards and guidelines;
- Ensure efficient and safe movement of workers, equipment, and materials with designated areas for sample preparation, analysis, and storage;
- Ensure adequate ventilation systems to maintain a safe and healthy working environment, to effectively remove any fumes and gases generated during analysis, Illumination/ lightning system;
- The laboratory should be equipped with modern and up-to-date equipment that meets the required standards;
- Ensure proper training of staff and workers including proper use of equipment, adherence to Standard Operating Procedures (SOPs), and safe handling and storage of hazardous materials;

- Ensure careful planning while selecting the site for new construction activities and should be at appropriate distance from the sensitive receptors (such as educational institutes, hospitals/ basic health units etc.);
- Proper arraignment for waste disposal
- The structures (where applicable) under the proposed subprojects shall be designed and constructed to withstand earthquake and flooding risks;
- Only shortlisted/pre-qualified Contractors shall be hired for the construction and rehabilitation works, supply of construction materials and equipment; and.
- PGs shall follow the criteria detailed under the project for the design and planning aspects (where applicable) and consider the climate smart ways in their BPs.

Considering the above mitigation measures, the significance of impact will be medium to low adverse.

### **7.2.2 Procurement of Pesticides and Vaccines**

The Procurement from uncertified sources, importation of the wrong pesticide specifications, low-quality pesticides and vaccines, adulterated pesticides and vaccines may have potential adverse impacts on the environment, human, livestock and fish.

Accidental releases may occur during transportation, storage, handling from manufacturer or distributor to the project stores, or from the stores to the point of use. A transportation spill may result in serious personal injury to the transport vehicle operators, as well as to the immediate public. If such spillage occurs, may results in a fire (Some pesticides are flammable and may pose a fire hazard), injury to humans and livestock (exposure), contamination of water and soil etc. This impact may be considered as moderate significant.

#### **Mitigation Measures**

- After competitive bidding process service providers shall be hired for the procurement of pesticides/ medicines/vaccines/ chemicals;
- Avoid procurement of pesticides and vaccines banned by Pakistan and WHO;
- Ensure transportation of pesticides as part of service providers responsibility through contract agreement;
- Ensure certified/licensed drivers and dedicated transportation having safety equipment;
- Ensure proper security of pesticides and vaccine stocks at stores and safety signage at appropriate locations in English, Urdu, and the local language(s) with a hazard symbol and also a caution symbol against unauthorized entry;
- Pesticides shall be stored in a cool, dry, well-ventilated area that is locked and inaccessible to irrelevant persons and kept away from heat sources, electrical equipment and avoid storing pesticides that are no longer needed;

- Ensure compliance with the relevant FAO guidelines for pesticides and Material Safety Data Sheet (MSDS) and MSDS must be accessible to all workers, in particular at pesticides stores;
- Ensure the provision of PPEs and trainings to staff/ workers involved in handling of pesticides and vaccines and safety equipment (fire extinguishers) and first aid kit at stores;
- Ensure proper monitoring of pesticides and vaccines stores facilities on periodic basis; and
- Ensure safe disposal of vaccine/ pesticide empty bottles / syringes after use.

### **7.2.3 Soil Erosion and Contamination**

The construction and rehabilitation activities may potentially involve excavation, quarrying/creation of borrow areas, land clearing, and land leveling and other related aquaculture and livestock activities conducted by PGs and PAs during project implementation<sup>40</sup>. These activities may disturb the surrounding soil, making it more susceptible to erosion due to wind or rain and degrading its quality. Whereas contamination of soil may be caused by solid and liquid waste (also from the construction camps, if established) generated at sites and by accidental leakage of fuel/lubricant. These impacts are expected to be limited to the immediate vicinities of sites. This impact is medium to low adverse in nature.

#### **Mitigation Measures**

- Embankments and excavated slopes will not be left untreated/unattended for long durations. The excavation for the foundation will be carried out only in specified area, as per the approved engineering design and the excavated material will be used for filling and compaction to the maximum extent possible;
- Avoid or minimize vegetation removal/clearing which would accelerate erosion;
- Sites disturbed by construction and rehabilitation activities will be restored to their original conditions upon completion of construction work and photographic record will be maintained to ensure pre-post project conditions intact;
- If any contaminated soils are found, it shall be removed and disposed appropriately at designated sites (as per advice of Environmental Specialist). All the waste generated at sites shall be properly disposed at designated sites;
- Vehicles must be properly maintained and regularly checked for possible leak of fuel. Waste oils will be collected in drums and sold to the recycling contractors;
- The Contractor will not leave the borrow pits in such a condition that they are unusable and could be filled with rainwater and cause the problems for the community;

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<sup>40</sup> Since the project footprints are not clear at this stage therefore, it is anticipated that the related aquaculture and livestock activities conducted by PGs and PAs during project implementation may have E&S impact.

- The inert recyclable waste from the site (such as card board, drums, broken/used parts, etc.) will be sold to recycling contractors. The hazardous waste will be kept separate and handled according to the nature of the waste;
- Ensure the training of workforce in the storage, handling of materials and waste management. Material Safety Data Sheets (MSDS) will be strictly followed;
- PGs ensure the compliance with the E&S criteria detailed under the project for BPs and take all necessary measures to protect environment; and
- PGs maintain close liaison with the PCMU/ relevant PMU for the E&S compliance.

#### **7.2.4 Waste Generation**

Wastes including discarded construction material (concrete, bricks, wood, glass, plastics), steel, oil, fuel, empty containers and bags, excavated material and municipal waste (particularly from the construction camps, if established) will likely be generated during the civil work construction and rehabilitation activities (office buildings, laboratories, hatcheries, research institute, veterinary units, animal sheds, milk collection center, animal sheds etc.) and other related aquaculture and livestock activities conducted by PGs and PAs during project implementation. If the waste is not well managed or properly dumped, it may negatively impact on the surrounding area including water and soil contamination. Discarded materials and equipment may also pose safety risks for the workers and pedestrians if left on the routes/unattended. The impact is moderate adverse in nature.

#### **Mitigation Measures**

- Display boards contains “Work in Progress”
- Use construction shed nets where the construction work is progressing for multiple stories.
- All the wastes shall be routinely collected and safely disposed of in clearly demarcated waste disposal sites. Waste disposal will ensure that there are no negative impacts on water bodies and soil, existing waste management systems, transport routes, and the aesthetic value of the area;
- Left over construction and demolition waste materials will be reused at other proposed project intervention sites, as far as possible in an effective way to save money while protecting natural resources;
- Construction camp (if established) will not be located within 500m of any water body. The contractor will develop camp layout and waste disposal system, and obtain approval from Supervisory Consultant;
- Site-specific Solid Waste Management Plans (SWMPs) will be developed and implemented by the contractors and workforce will be trained in the handling, storage, and disposal of construction waste. Burning of waste material will not be allowed;

- The construction wastewater from the work site will be disposed through a settling tank of appropriate capacity, which will be levelled back after completion of construction work;
- Ensure the compliance with SEQS and IFC/WHO guidelines whichever is stringent (as advice of Environment Specialist);
- Fuels and chemicals will be stored on concrete-floored, bounded, covered to provide shade and prevent the ingress of rain and should be located away from the open water sources;
- Resource conservation themes to be included in awareness raising and training sessions for project staff;
- PGs ensure the compliance with the E&S criteria detailed under the project for BPs and take all necessary and relevant measures for proper handling of waste; and
- PGs maintain close liaison with the PCMU/ relevant PMU for the E&S compliance.

### **7.2.5 Health Care Waste Generation**

Inappropriate disposal of health care waste including vaccine/ syringes, infectious and municipal waste from health care facilities/ veterinary hospitals may cause environmental (such as Soil, Air and water quality deterioration) and health risks. The hazards associated with improper waste disposal by any healthcare facility operation are mostly caused by not following the infection control protocols, not using proper PPEs, and not employing proper procedures for waste collection, transportation, storage, and final disposal. In addition, recycling of health care waste also poses very serious health risks for the workers involved in recycling and also consumers using the recycled products. Similarly, liquid and solid waste will be generated from aquaculture activities during implementation phase.

The project will involve the procurement of various equipment and machinery. Electronic waste (E-waste) is expected to be generated at the start of the project when obsolete equipment and machinery will be disposed of and by the end of the useful life of the procured equipment and machinery. Improper handling and disposal may cause environmental and health risks to the workers and surrounding communities. The impact is substantial adverse in nature.

#### **Mitigation Measures**

- Ensure strict compliance with the procedures specified in the Sindh Hospital Waste Management Rules 2018; and World Bank Group EHS Guidelines for Health Care Facilities, Aquaculture and Mammalian Livestock Production;
- Auto disable (AD) syringes shall be used to avoid the spread of infections;
- Ensure the provision of colored containers/bins with paddle along with training of health care staff/ waste management workers;
- Non-risk/municipal waste (such as paper, cardboard, vegetable peelings, food packing, cold drink bottles, cans etc.) will be disposed appropriately;

- Ensure monitoring of waste handling, storage, transportation and disposal to ensure proper implementation of waste management system;
- Sharps and infectious wastes shall be transported to a dedicated waste burning facility/pit burial or incinerators (preferred option) and ensure proper disposal and complete burning;
- Pit burial (if used) shall be lined with cement and covered with the cement slab to avoid soil and water contaminations;
- Ensure the compliance with SEQs and WHO/IFC guidelines whichever is stringent shall be followed (as per advice of Environment Specialist);
- Ensure provision of PPEs and trainings to workers, involved in waste management;
- Ensure, concerned staff shall not involve in selling of health care wastes (vaccine/syringes) for profit earning, as it further aggravates the health hazards;
- Resource conservation themes to be included in awareness raising and training sessions for project staff; and
- Proper disposal of E-waste by following E-waste management procedures as attached Annex- B.

#### **7.2.6 Ambient Air Quality**

A decline in the ambient air quality within the vicinity of works is expected during the construction and rehabilitation activities due to the movement of construction machinery (operation of concrete batching and concrete mixer, diesel generator,) and activities (excavation, site clearance and leveling, filling of earth material, demolition, loading/unloading of material etc.) other related aquaculture and livestock activities conducted by PGs and PAs during project implementation. During the implementation of the project emissions may release (low to moderate level) from vaccine production unit, mobile units, generators (installed in milk collection center) etc. also contribute to deterioration of air quality. The impact is low to moderate adverse in nature.

#### **Mitigation Measures**

- Vehicles and other equipment (such as generator) used during construction and rehabilitation activities shall be kept in good working condition and be properly tuned and maintained with designated fuel in order to minimize the exhaust emissions and to ensure fuel efficiency;
- All dust raising locations shall be kept wet with water sprinkling. Fugitive dust emissions will be minimized by appropriate methods such as spraying water on material where required and appropriate. It will be ensured that the construction debris is removed on regular basis;
- Construction material such as cement, loose material, sand, or aggregates and spoil materials will be transported in a covered truck. Impose speed limits on all vehicle movement at the worksite to reduce dust emission;

- Road damage caused by project activities will be promptly attended with proper road repair and maintenance work;
- Proper Personal Protective Equipment (PPE) shall be provided to the site workers and staff and make sure the workers wear the PPE properly during working on site;
- Ensure compliance with the SEQs and IFC/WHO guidelines whichever is stringent (as per advice of Environment Specialist);
- PGs ensure the compliance with the E&S criteria detailed under the project for BPs and take all necessary relevant measures to protect the environment; and
- PGs maintain close liaison with the PCMU/ relevant PMU for the E&S compliance.

### **7.2.7 Noise Pollution**

Noise may be generated from construction machinery, generators, offloading of materials, and construction and rehabilitation activities and other related aquaculture and livestock activities conducted by PGs and PAs during project implementation. Noise pollution generated by the construction activities may likely to have impacts on the nearby sensitive receptors (if any), workers, nearby communities and local wildlife. During the implementation of the project noise may also be generated from mobile units, generators (installed in milk collection center) etc. The impact is low to moderate adverse in nature.

#### **Mitigation Measures**

- Vehicular traffic through the communities shall be avoided as far as possible. Project routes shall be authorized by the Contractor. The main roads will be used by the construction traffic to the maximum extent possible;
- Construction vehicles and machinery shall be kept in good working condition and be properly tuned and maintained throughout construction work to minimize excessive noise/vibration;
- Noisy construction work shall be limited to normal working hours to minimize disturbance to nearby communities, avoid excessive use of horns and vehicle speeds will be kept low;
- PPEs shall be provided and worn by the personnel involved in construction and rehabilitation activities and training them in their use;
- Construction schedules shall be disclosed to the nearby communities, where required/as per advice of Environmental Specialist;
- Vehicles and equipment shall be maintained regularly;
- Ensure the compliance with SEQs and IFC/WHO guidelines whichever is stringent (as advice of Environment Specialist). Ensure the effective implementation of GRM;
- PGs ensure the compliance with the E&S criteria detailed under the project for BPs and take all necessary relevant measures to protect the environment; and
- PGs maintain close liaison with the PCMU/ relevant PMU for the E&S compliance.

### 7.2.8 Solarization of Facilities

The project will support rehabilitation of Veterinary Hospitals and Clinics. They will be equipped with cold chain for conservation of vaccines (solar). Incompatible layout plan and design may have potential impact of visual effects. The solar panels and their support structure may be damaged by the windstorm. Installation of solar systems may also generate small amount of waste, may cause damages to plumbing and electric wiring, and roof leakage. Solar panels may add weight and increase wear and tear on the roof, potentially reducing its lifespan, especially if the roof is already weakened or damaged. This impact is low adverse in nature.

#### Mitigation Measures

- Only shortlisted/pre-qualified service providers should be hired for the supply of solar systems;
- The technical design for installation of solar panel must consider all the above-mentioned factors and load bearing assessment of roof as well. The supporting structure will need to be designed adequately to avoid any damage during the wind storms;
- Lead/acid/cadmium-based batteries will not be procured for solarization;
- Ensure panels are treated with anti-reflective coating which reduces the sun's reflection from PV panels;
- Ensure that no waste material left behind after the completion of work;
- The Contractor will be made responsible to repair any damaged caused by the installation of solar panels;
- PGs shall ensure the compliance with the relevant above measures if the BPs involve solarization.

### 7.2.9 Flora and Fauna (Ecological and Biodiversity)

The proposed project is likely to have moderate ecological and biodiversity risks and impacts as the project activities will be carried out both in the built and natural environment. Activities under component-1 and 2 regarding inputs, and services to livestock and aquaculture producers for animal health improvement (vaccination and treatment), breeding and genetic improvement, and increased productivity and production of livestock and fisheries may have moderate ecological and biodiversity impacts. Risks, impacts and mitigation measures are given as under.

#### Clearing and damage to native vegetation and introduction of exotic species

Clearing of native vegetation for construction of small livestock feed production units, construction of livestock sheds, and construction, improvement and expansion of aquaculture ponds and required facilities. There is also risk of planting of exotic plants and tree species such as Conocarpus and Eucalyptus species in the cleared areas. The significance of this impact is low.

#### Mitigation Measures



- No interventions shall be carried out in any natural and critical habitats. Moreover, the Contractor will ensure that any surplus construction waste shall not be disposed of in close proximity to the natural and critical habitats;
- The Contractor's staff and labor shall be strictly directed not to damage any nearby agriculture land/vegetation/trees;
- Sites, for the installation of construction camps (if required) and mobility of construction machinery shall be properly planned to avoid or minimize the cutting of trees/shrubs/herbs and loss of agriculture land; and
- Compensatory plantation of native species shall be carried out with a ratio of five trees for each tree felled/damaged. Forest and Wildlife Departments shall be consulted to fulfill the legal requirements, where applicable.

### **Hunting, Poaching and Accidental Mortalities of Wildlife**

The aquaculture farms in Sindh being situated near natural water bodies and cabals have become important habitats for wildlife such as migratory birds, Smooth Coated Otters and Freshwater Turtles. Most of these species are threatened or endangered and are legally protected<sup>41</sup>. There is risk of hunting, poaching and killing mainly for protection of fish stock, illegal trade and meat. The significance of this impact is medium/ moderate.

### **Mitigation Measures**

- Actively engage the Sindh Wildlife Department and Conservation NGOs for technical and regulatory support to conserve the project areas and help communities to play their positive role;
- Include wildlife protection and habitat improvement in the TORs of the farmers' groups and their agreements with the SLAST Project to legally bind them to protect and conserve wildlife including migratory water fowl, other birds, otters and freshwater turtles in and around their respective ponds;
- Support the Farmers Groups in activities like planting and regeneration of suitable native species of trees and plants around the aquaculture ponds as well as blank spaces in the surrounding areas to improve the natural habitat;
- Organize awareness, education and trainings for farmers and project staff to reduce risks of hunting, poaching and killing of wildlife species in their areas. A comprehensive campaign should be developed and implemented in partnerships with the Sindh Wildlife Department and Conservation NGOs like WWF-Pakistan; and
- Sign boards and safe wildlife crossings along roads and highways: Where fish ponds are situated nearby or along the roads proper sign boards should be provided indicating wildlife crossing areas and speed limit. Where possible the project should provide culverts as safe crossings/ passage ways for wildlife especially turtles and otters.

### **Use of Lethal Drugs and Pesticides Resulting in Mortality of Wildlife**

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<sup>41</sup> Ghalib et al., 2018

There is risk of using lethal drugs for wildlife especially vultures. These include Non-Steroidal Anti-inflammatory Drugs (NSAIDs) such as Diclofenac, Aceclofenac, Ketoprofen and Flunixin. These drugs are responsible for 99% decline in population of the three critically endangered vulture species across south Asia including Pakistan. Vultures feed on carcasses of dead animals and those treated with the aforementioned lethal drugs case mortality in vultures<sup>42</sup>. The significance of this impact is medium/ moderate.

### **Mitigation Measures**

- Develop and implement comprehensive awareness and education campaigns: to enhance awareness and education among the veterinary practitioners, farmers, and communities about the lethal and toxic drugs, chemicals and pesticides, their negative impacts on humans, biodiversity and ecosystems, and use of safe alternatives and practices. The campaign should consist of awareness sessions, visits, awareness print material in local language (leaflets, guides, manuals), exposure visits and trainings; and
- Promote use of safe drugs and pesticides: Meloxicam (an NSAID drug proved safe for vultures) should be promoted in livestock veterinary treatment practices. For fish fungal diseases less toxic pesticides such as Acetamiprid (a less toxic to aquatic life than Cypermethrin) should be promoted and used<sup>43</sup>.

### **Disease Transmission from Livestock to Wildlife**

There have been some incidences of disease transmission to wildlife (Viral disease from goats/ sheep to Ibex in Kirthar National Park and domestic poultry to Wild Peacocks in Tharparker). Risk of disease transmission to wildlife can happen in case infected animals and birds from project areas move to rangelands. The significance of this impact is low.

### **Mitigation Measures**

- Regular monitoring of livestock diseases, timely treatment and vaccinations and rapid response to incidents;
- Ensure that infected animals are quarantined and are not taken to rangelands and pastures especially areas falling adjacent to protected areas and other ecologically sensitive areas.

### **Introduction of Alien Invasive Fish Species**

Introduction of alien invasive fish species may affect the native species by preying on and competing with them for food, breeding sites and altering habitat. Alien invasive species may introduce new diseases or parasites to the fish pond, negatively affecting the health of native species. Some alien invasive species may contribute to water quality issues by producing excess nutrients or disrupting nutrient cycling, leading to problems such as eutrophication and algal blooms. The presence of alien invasive species may have economic consequences for fish farmers, as they may cause declines in the production of desired fish species or result in increased costs for disease control and management. alien invasive

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<sup>42</sup> IUCN, 2018; WWF-Pakistan 2023; Hawk Conservancy Trust, 2023

<sup>43</sup> WWF-Pakistan, 2023; I. Willoughby et al., 2020

species from fish ponds may escape into natural water bodies through various means, including flooding or intentional releases, leading to the spread of the invasive species and further ecological disruptions in natural ecosystems. The significance of this impact is high.

### **Mitigation Measures**

- Implement effective screening methods to prevent the entry of alien invasive fish species into fish ponds. Ensure regular monitoring of incoming stock for any signs of invasive species;
- Establish a quarantine area for new fish stock to prevent the accidental introduction of invasive species. Quarantine should include a thorough inspection and observation period to detect and address any potential issues before introducing fish to the main pond;
- Educate pond owners, workers, and surrounding communities about the risks of invasive species and their alternatives;
- Choose native or non-invasive species for aquaculture to minimize the risk of unintended introductions;
- Maintain ecologically safe distance of the ponds from natural water bodies: The project supported aquaculture ponds should preferably be at ecologically safe distance from natural water bodies;
- Promote improved design and structure of the aquaculture ponds to reduce the risk of flood damage, and submerging in floodwater;
- Establish a reporting system for suspected cases of invasive species to facilitate prompt response, and
- Impose penalties for non-compliance to encourage responsible practices;

### **Impact on Water and Land Resources**

Though fish ponds have several benefits and positive impacts like fish production, water storage for later uses, creation of wetlands habitats, however if improperly designed and poorly managed these ponds may have some negative impacts as well. The extraction of water for fish ponds may impact water resources by reducing both quantity and quality. This diversion of water for aquaculture may exacerbate existing stress on water resources, especially in regions facing water scarcity. Furthermore, the discharge of effluents from fish ponds into surrounding water bodies introduces excess nutrients, organic matter, and potentially chemical residues (used in aquaculture practices to treat the disease). This discharge may result in nutrient enrichment and eutrophication, leading to the growth of algae and aquatic plants, and subsequently, depletion of oxygen levels, negatively impacting the health of aquatic ecosystems. Moreover, the aquaculture ponds may cause waterlogging and salinity especially in low lying and poorly drained areas. Also improperly designed aquaculture ponds and application of saline groundwater often result in waterlogging and salinity, leading to damage to fertile land, habitats, flora and fauna. The

significance of this impact is high. With implementation of the mitigation measures the impact rating will reduce to low.

### **Mitigation Measures**

- Careful site selection for fish ponds, considering factors like water availability, local hydrology, and environmental impacts, shall minimize the stress on water resources;
- Implementing effective effluent treatment systems before discharging pond water into natural water bodies helps reduce the introduction of pollutants and excess nutrients, mitigating the risk of eutrophication;
- Promoting the reuse of water within fish farm operations helps to minimize the overall demand for freshwater. Pumping and application of saline groundwater in ponds should be discouraged specifically in agriculture areas where canal water is available.
- Promote proper design and drainage system of the aquaculture farms to reduce, seepage from the ponds, this will also help reduce water losses from ponds and will help overcome the issue of water shortage.
- Engaging local communities and other relevant stakeholders to raise awareness on sustainable water management practices; and
- Ensure the compliance with SEQs, 2016 and /or WHO/IFC guidelines whichever is stringent (where applicable/ as per advice of Environmental Specialist).

## **7.3. Potential Social Impacts and Mitigation Measures**

### **7.3.1 Occupational Health and Safety Risks**

Occupational Health and Safety related risks may arise including unsafe and unhealthy working conditions, risk incident and accident during the construction and rehabilitation activities during installation of contractor camps (if established<sup>44</sup>), deep excavations, steel fixing, installation of a batching plant, concrete pouring, installation of solar panels, movement of project vehicles and equipment, manual handling during loading-unloading operation, fire hazard, during immunization (vaccines/syringes), exposure to chemicals (fertilizers and pesticides) to treat or control the diseases, exposure to water borne disease, exposure to diseases from animals, bad housekeeping, inappropriate collection, storage, transportation and disposal of hazardous waste, risk of drowning in fish ponds, installation of medical equipment, lack of compliance with local OHS rules and regulations, risks of GBV/SEA/SH, child labor and forced labor etc. This impact is moderate adverse in nature.

### **Mitigation Measures**

- The Contractor will be required to strictly follow Sindh Occupational Safety and Health Act, 2017 and World Bank Group EHS Guidelines, 2007 (relevant to the

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<sup>44</sup> Mostly the local labor would be hired due to small scale civil works. Establishing regular construction camps by the contractor(s) is unlikely. However, given measures would be taken, if needed

project). The Contractor shall prepare the site-specific occupational health and safety plan and ensure the compliance;

- Ensure the compliance with the World Bank Group EHS Guidelines for Aquaculture, Mammalian Livestock Production and Health Care Facilities;
- Ensure compliance with the Worker's Code of Conduct provide in the LMP;
- Ensure that the site will be restricted for the entry of irrelevant people particularly children, disabled and elderly peoples. Ensure the use of safety signs at the construction site;
- Ensure the provision of fire prevention and firefighting equipment;
- Ensure the provision of PPEs to all workers, visitor and compliance with SEQS, 2016.
- Training of workers in health and safety procedures, use of PPEs, defensive driving, provision of first aid, emergency prevention, preparedness and response arrangements by the Contractor;
- Include procedures for documenting and reporting accidents, diseases, and incidents as per the procedure defined in the LMP;
- Identify and minimize, so far as reasonably practicable, the causes of potential hazards to workers, including communicable diseases such as HIV/AIDs and vector borne diseases;
- Awareness and training program shall be conducted regarding pest management, sustainable use of fertilizers, safe disposal of empty containers; and
- The infrastructure (office building, laboratories, research institutes, milk collection center) shall be equipped with appropriate safety equipment to avoid or minimize the health and safety risks.

### **7.3.2 Community Health and Safety**

Community health and safety risks may arise during the construction and rehabilitation activities of infrastructure (office buildings, laboratories, hatcheries, research institute, veterinary units, animal sheds, milk collection center, animal sheds, fish ponds etc.), capacity building sessions, technical assistance, immunization and other related aquaculture and livestock activities conducted by PGs and PAs during project implementation. Risks include exposure to dust and noise, accidents/incidents, physical injuries due to falls in excavated sites, exposure to hazardous materials, inappropriate disposal of liquid, solid wastes, SEA/SH, spread of animal diseases, food safety, effects of water resources, salinization of neighboring agriculture land, drowning. Conflicts may arise between the local community and the workers, which may be related to religious, cultural or ethnic differences, or based on competition for local resources. The labor works with different transmittable diseases may cause spread out of those diseases in the locals of nearby community. The impact significance is moderate adverse.

### **Mitigation Measures**

- The Contractor will prepare site specific community health and safety plan in compliance with relevant sections of the WBG General Environmental Health and Safety Guidelines 2007 (relevant to the project);
- Ensure that the site will be restricted for the entry of irrelevant people particularly children, disabled and elderly peoples. Ensure the use of appropriate safety signs at the construction and rehabilitation site;
- Ensure the compliance with the World Bank Group EHS Guidelines for Aquaculture, Mammalian Livestock Production and Health Care Facilities;
- Ensure compliance with the Worker's Code of Conduct provided in the LMP;
- Ensure the compliance with the mitigation measures provided for air, noise and waste management;
- Vehicle limit shall be kept low and horns will not be used while passing through or near the communities;
- Effective implementation of GRM will be ensured to timely address the issues;
- Contractor will take due care of the local community and observe sanctity of local customs and traditions. Contractor will warn the staff strictly not to involve in any unethical activities and to obey the local norms and cultural restrictions; and
- Awareness sessions will be conducted regularly for community, and workers on road safety, communicable diseases, emergency procedures, worker code of conduct and basic medical services.
- Food safety guidelines will be provided to PGs and PAs by the project, and the same will be monitored during project lifetime

### **7.3.3 Security Issues**

The project stretches across a vast area, therefore, there may be security risks during the implementation of project activities, particularly in remote regions and regions with known security and law and order issues (e.g. kacha). This may lead to security related incidents including travel safety and premises safety. The impact is assessed as substantial adverse.

#### **Mitigation Measures**

- The Project will continue to rigorously engage with the local communities to ensure a positive image amongst the people in the project area;
- The Contractor shall maintain communication through employer with local police and law enforcement agencies and inform about construction activities particularly for sensitive areas;
- The Contractor shall prepare emergency evacuation procedure and display emergency contact numbers;
- A detailed Security Management Plan will be developed by the project and by the Contractor as part of Site specific ESMP (where applicable). This plan will be strictly

implemented, and also reviewed and updated periodically in view of the current security situation of the area; and

- Ensure the effective implementation of GRM.

#### **7.3.4 Gender Based Violence (GBV)**

GBV, including sexual exploitation and abuse (SEA) and sexual harassment (SH) risks may arise for women and children (especially of minorities), other vulnerable groups and project staff during project implementation, particularly during the civil works and technical assistance activities. The Project may involve significant contact between Project workers and beneficiary communities (through mass awareness campaigns, farmer field schools, pond schools, village demonstration units), and training for small and medium farmers/farming communities leading to an increase in the rate of communicable diseases, GBV, SEA, and SH. This risk may be further compounded during selection of women beneficiaries/PGs. The impacts are assessed as substantial adverse.

#### **Mitigation Measures**

- A separate Action Plan on GBV/SEA/SH will be prepared for the Project and same will be implemented;
- The GBV/SEA/SH complaints received through the GRM will be redirected to the dedicated staff who are trained on the GBV Action Plan with the required sensitivities and confidentiality. It will be ensured that safe and confidential accountability mechanism is established for complaints;
- Labor and or other staff engaged by the contractor will be educated and made aware of the civil, social, and legal rights of women and vulnerable groups (poor women, single women living alone, elderly, infirm or ill, orphans), and about the actions taken in the event of GBV and SEA/SH;
- Awareness session will be conducted regularly for community and workers through skilled trainers/ service providers. Targeted communications and awareness to women regarding potential SEA / GBV risks, especially as literacy rates amongst women are lower. This could include organizing consultations during times when women are not busy with their household chores, holding consultations in areas accessible to women;
- Project staff (skilled and unskilled) will sign the code of conduct describing acceptable and prohibited behaviors and communicated through training and publicized;
- Service providers will be identified and mapped to address SEA/SH issues; and
- Provision related to SEA/SH or GBV will be incorporated in the bidding document of the Contractor and Local Service Providers (LSPs).

#### **7.3.5 Forced/Child Labor**

The project activities may carry a risk of child labor and forced labor. Child labor/family labor is common in rural Sindh whereby the younger family members are involved in

livestock and aquaculture management. Also, specifically for aquaculture, exploitation of labor in the shape of lower than minimum wages, poor working conditions and lack of documentation is a risk. These risks are likely to be higher in economically disadvantaged and remote areas of the province. This risk will be further compounded during operations of PGs.

### **Mitigation Measures**

- Contractors and LSPs and will be prohibited from hiring children below the age of 14 for any type of labor, and below the age of 18 for hazardous work. Contractor, PGs and LSPs through contractual agreement will be bound to follow the provincial labour laws and World Bank requirements during hiring the labor force;
- Project staff will monitor sites to check for child labor and will hold regular consultations to keep a check on forced labor at project sites;
- Awareness will be created among the local communities and project staff about the adverse impacts of child labor. Contractors will be required to follow the LMP with regard to contracts and terms of employment for labor.

### **7.3.6 Targeting, Social Exclusion, and Elite Capture**

The project activities may carry risk of social exclusion and elite capture. Women, vulnerable groups and historically underserved communities may fail to benefit from and be excluded from activities such as awareness campaigns, dissemination of technical innovations to smallholder farmers through Livestock Farmer Field Schools, access to aquaculture extension services and competitive research and innovation grants under Component 1; and technical assistance and financial support to producers and producer groups and productive alliances under Component 2. This risk can be compounded by elite capture by large/influential farmers and selection bias in preliminary surveys to identify target villages, members of producer groups, and buyers and market enablers to be part of PAs. Historically underserved areas may also be excluded due to project focus on geographical concentration and targeting of project interventions where commercial opportunities and the need for market linkages support have been identified and expressed by market actors (producers, processors, and others). The risks are assessed as substantial adverse.

### **Mitigation Measures**

- At least 30% of Women beneficiaries will be ensured;
- All project staff with functions related to recruitment will be trained on social inclusion and the relevant government and Bank regulations;
- Tailored TA for female-headed PGs that will include business leadership networking support to enable them to access markets and manage business operations;
- Specific application window for female-headed PGs. In addition to receiving tailored support for forming and registering PGs, female-headed PGs will be able to apply for technical and financial support for the implementation of their BPs under conditions designed to help address the specific market failures faced by women in the



livestock and aquaculture sectors. These will include: (i) the possibility of applying with a PG with as few as five members; (ii) an identification of end markets that does not need to be sanctioned by a formal commercial agreement with a buyer (contrary to other PAs supported in this subcomponent); (iii) the possibility of presenting BPs for businesses outside of the project's target four subsectors, notably for backyard poultry rearing and backyard fish farming, which are typically managed by women in Sindh; and (iv) lower levels of expected financial matching (i.e., 10 percent, vs 25 percent for other groups);

- Training module designs to consider ways to improve gender inclusion in terms of the training's content and delivery mechanisms;
- Identify traditional fishing communities and ensure they have free and fair access to project benefits;
- Accessibility of awareness campaigns, materials and trainings for the illiterate and disabled (hearing and visually impaired);
- Mitigate elite capture through: (i) mass awareness creation campaigns through print, electronic, and social media platforms to invite applications from interested farmers clearly mentioning that only SMPs will be eligible for project assistance; (ii) mandatory submission of documentary evidence regarding eligibility and selection criteria during the application process (e.g., from the Land Recording Management System, National Socio-Economic Registry, or other relevant sources, depending on the criteria); (iii) installation of signboards on each site to make relevant information public (e.g., name of the beneficiary, total support cost, subsidy share, farmer's contribution, and so on); (iv) annual surveys carried out through the M&ECs to assess potential inclusion errors; (v) comprehensive review during the MTR to assess the profiles of beneficiaries reached and adjust project design if needed;
- Conduct regular beneficiary feedback surveys to assess targeting and inclusion of project activities;
- Ensure an accessible and effective Grievance Redressal Mechanism; and
- Ensure the project Stakeholder Engagement Plan (SEP) is implemented throughout the project lifetime.

### **7.3.7 Lack of Meaningful Community Engagement**

Comprehensive and inclusive stakeholder engagement is a key feature of the ESF. The presence of poor and marginalized communities in the project area will require careful attention to be paid to stakeholder engagement. There is a risk that vulnerable groups and communities may be excluded from stakeholder consultations, limiting their ability to provide feedback on project design and impacts, and potentially preventing them from fully benefiting from the project. This risk is proportionate to their degree of disadvantage/vulnerability and is additionally relevant for communities living in remote or historically underserved areas.

### **Mitigation Measures**

- A comprehensive Stakeholder Engagement Plan (SEP) has been developed and will be implemented during course of project;
- Mapping and engaging stakeholders, including vulnerable groups at the start of the design process and obtaining their feedback about project interventions;
- PCMU and PMU dedicated staff will be responsible for the implementation of the SEP and GRM; and
- Project staff will be trained on social inclusion and stakeholder engagement.

### **7.3.8 Chance Findings of Important Physical and Cultural Resources**

The project activities planned under the project are not anticipated to directly impact any cultural heritage site. The project investments include civil works related excavation, therefore, the project may encounter the chance finding of important physical cultural resources during the construction and rehabilitation phase.

#### **Mitigation Measures**

- Subprojects sites will be screened for the presence of physical cultural resources prior to commencement of construction and rehabilitation work and other related aquaculture and livestock activities conducted by PGs and PAs during project implementation;
- Ensure the compliance with the chance find procedure provided in Annex-C.

### **7.3.9 Exclusion Risks to Women**

Cultural constraints do not allow a woman to play a lead role in business until and unless she is an orphan or a widow. The low participation of women in farming-related decision-making processes further deprives women producers from accessing innovations, extension services, entrepreneurship training, and technologies, which ultimately limits their potential to grow and increase their incomes in livestock and aquaculture. Women may also face cultural hurdles in accessing Farmer Field Schools and extension services. Low ownership of CNICs by women may further compound these risks as they are unable to register for project benefits or access banking channels required to receive grants under Component 2. The risk of exclusion of women is particularly relevant for livestock producers where women are predominantly responsible for the majority of livestock rearing, feeding, milking and dairy processing activities, but are not directly involved in market activities and do not manage the cash transactions or directly receive revenues. The risks are assessed as substantial adverse.

#### **Mitigation Measures**

- At least 30% of Women beneficiaries will be ensured;
- All project staff with functions related to recruitment will be trained on social inclusion and the relevant government and Bank regulations;
- Tailored TA for female-headed PGs that will include business leadership networking support to enable them to access markets and manage business operations;

- Training module designs to consider ways to improve gender inclusion in terms of the training's content and delivery mechanisms;
- Identify traditional fishing communities and ensure they have free and fair access to project benefits'
- Accessibility of awareness campaigns, materials and trainings for women;
- Conduct regular beneficiary feedback surveys with women to assess targeting and inclusion of project activities;
- Ensure an accessible and effective Grievance Redressal Mechanism;
- Ensure the project Stakeholder Engagement Plan (SEP) is implemented throughout the project lifetime;
- The project will support a dedicated application window for female-headed PGs to enable their access to (i) tailored support for registering as formal PGs with as few as five members; (ii) technical and financial support for the implementation of their BPs under conditions designed to help address the specific market failures faced by women in the livestock and aquaculture sectors;
- Given that backyard poultry rearing, and backyard fish farming are typically managed by women, the project will support female-headed PGs to present BPs for such activities, even though they are outside of the project's target sub-sectors;
- The project will also provide preferential conditions for female-led PGs by lowering the expected levels of financial matching (i.e., 10 percent vs 25 percent for other groups), and by lifting the requirement of identifying a formal commercial agreement with a buyer; and
- The project will track the number of PA BPs approved and funded for female-led PGs to monitor the narrowing of gender gaps.

### **7.3.10 Land Acquisition and Involuntary Resettlement**

There is no acquisition of private lands expected under the component 1 of the project. The project activities under Component 1 include small to medium scale civil works for the expansion of government livestock and aquaculture facilities, hatcheries, laboratories and district veterinary complexes. Construction for majority of these activities will be on existing Livestock and Fisheries Department facilities and land. The construction of district level veterinary complexes may require additional government lands which will be acquired through the DC. However, the locations of these complexes has not been confirmed yet. Additionally, the civil works on expansion of existing and construction of new facilities may result in the removal of informal settlers and encroachers. Under Component 2, milk collection centers for PGs will be established within villages on community donated land. Approximately 300 centers will be established of 500-1000 square feet each.

### **Mitigation Measures**

As the locations for the civil works and milk collection centers are not known, a Resettlement Framework as per World Bank ESS5, including a Voluntary Land Donation Framework will be prepared by the project.

#### **7.3.11 Cold Chain Management for Vaccine Effectiveness**

Cold chain management is crucial in the context of live livestock vaccination to ensure the efficacy and safety of vaccines. Vaccines need to be stored at recommended temperatures to remain effective. Failure to maintain the required temperature can result in a loss of vaccine potency, rendering them ineffective. The vaccine might not achieve its targets of disease(s) elimination, as well as causing mistrust amongst the communities (occurrence of disease despite vaccination), if the cold chain breaks loss of livelihoods due to inadequate administration of vaccines.

### **Mitigation Measures**

- Vaccines shall be stored at standard temperatures (+2C° to +8C°);
- Regularly maintain and calibrate refrigeration and freezing equipment to ensure they operate within the required temperature ranges;
- All health care facilities shall backup electric supply to ensure the required standard temperature for vaccination storage;
- Standard stock ledger with name of the vaccine, quantity in doses, vial size, manufacturer, expiry date, batch/lot number, date of receive and supply to be maintained at all level and updated regularly;
- Reconstituted vaccine must be discarded after the specific timeframe provided by the manufacturer, where applicable;
- Ensure the provision of appropriate PPE to workers and other health staff;
- Provision of trainings on vaccine Administration & Management to be provided to health staff.
- Develop and implement contingency plans for potential cold chain failures, including protocols for transferring vaccines to alternative storage facilities in case of equipment malfunctions; and
- Provide training to personnel involved in the cold chain, including handlers, transporters, and vaccination administrators, on the importance of maintaining proper temperature conditions

#### **7.3.12 Impact of Disease Outbreak**

Disease outbreak may lead to significant mortality rates among the fish population and result in substantial economic losses for fish farmers. Disease outbreaks may result in the release of medications and chemicals into the pond, affecting water quality and potentially causing environmental pollution. If not properly managed, diseases may spread within the

fish pond, affecting a larger proportion of the fish population. The presence of one disease may pave the way for other opportunistic pathogens, leading to a compounding effect on fish health. This may also affect the ability to trade or sell fish products due to regulatory requirements.

### **Mitigation Measures**

- Establish and enforce strict biosecurity measures to prevent the introduction and spread of diseases;
- Implement a quarantine period for new fish stock before introducing them to the main pond. This allows for the observation of any signs of disease and prevents the introduction of pathogens to the healthy population;
- Regularly monitor the health of the fish population. This involves routine visual inspections, as well as periodic health assessments by trained professionals of the Department. When applicable, use proper precautionary measures including treatment of fish against specific diseases;
- Maintain optimal water quality parameters, as poor water quality can stress fish and make them more susceptible to diseases. Regularly test and monitor parameters such as dissolved oxygen, pH, temperature, and ammonia levels;
- Provide a balanced and nutritious diet for the fish to enhance their immune system;
- Develop and implement an emergency preparedness plan that includes protocols for disease outbreaks; and
- Educate fish farmers, workers, and stakeholders about the importance of disease prevention and biosecurity measures.

## **8. Implementation of ESMF**

This chapter summarizes the mitigation, monitoring requirements, screening procedure, institutional arrangement monitoring and measures to be taken during the implementation and implementation budget.

### **8.1. Key Steps for Environmental and Social Management**

- E&S screening and categorization of each subproject using the E&S Screening Checklist;
- Information disclosure and stakeholder consultations as per guidance provided in the SEP;
- Preparation of Environmental and Social Management Plan (ESMP)/checklist with mitigation measures/other E&S instruments, indicative budget for E&S management.
- Clearance/approval of ESMP/E&S instrument from World Bank.
- Inclusion of ESMP and other E&S instruments in bidding documents and agreements with Contractors.
- Implementation of ESMP and other E&S instruments by implementing agencies/contractors.
- Monitoring the compliance with E&S instruments.
- Integration of Recommendations in Project Design / E&S Instruments
- Sufficient budget should be allocated for the effective implementation of mitigation measures;
- Strengthening and capacity building through trainings/awareness sessions/workshops of the E&S staff;
- Induction of qualified Environmental, Social and Gender Specialists and Officers at PCMU and PMU level.
- Information pertaining to impacts identified and mitigation measures adopted should be reported in detail in the progress reports;
- Roles and responsibilities of key players involved in the implementation of ESMF should be defined;
- Ensure the incorporation of ESMP/ E&S instrument in the contract Documents for compliance;
- Ensure the incorporation of E&S requirements in the Agreement of PGs with the project and undertaking to ensure the compliance; and
- Engagement of relevant stakeholders should be ensured for effective implementation of ESMF/E&S instruments.

## 8.2. Screening Analysis – E&S Screening

As a first step, all proposed activities should be screened to ensure that they are within the boundaries of the Project's eligible activities, and they are not considered as activities listed in the E&S Exclusion List as below:

**Table 10 E&S Exclusion List**

- 
- Any construction in protected areas or priority areas for biodiversity conservation, as defined in national law.
  - Activities having “significant adverse cumulative/transboundary impacts.
  - Activities that have the potential to cause any significant loss or degradation of critical natural habitats, whether directly or indirectly, or which would lead to adverse impacts on natural habitats.
  - Use of banned pesticides/fertilizers and vaccines of Pakistan and WHO regulations.
  - Support to larger producers as per the criteria of the project.
  - Support BPs from the cattle colony sub-sector due to the waste and emissions they generate.
  - Project Aquaculture Activities in inland natural waterbodies and canals: No natural water bodies and canals should be used for aquaculture activities. Natural water bodies include Rivers, Streams, and Lakes.
  - Lethal drugs for wildlife (especially for vultures) including Diclofenac, Aceclofenac, Ketoprofen and Flunixin: These drugs should not be used for treatment of livestock.
  - Hunting, poaching, killing and trading of legally protected wildlife species under the Sindh Wildlife Protection, Preservation, Conservation and Management Act, 2020, and Cites.
  - Activities that involve extensive harvest and sale/trade of forest resources (post, timber, bamboo, charcoal, wildlife, etc.) for large-scale commercial purposes.
  - Activities that involve the use of international waterways.
  - Any activity affecting physical cultural heritage such as graves, temples, churches, historical relics, archeological sites, or other cultural structures.
  - Activities that may cause or lead to forced labor or child abuse, child labor exploitation or human trafficking, or subprojects that employ or engage children, over the minimum age of 14 and under the age of 18, in connection with the project in a manner that is likely to be hazardous or interfere with the child's education or be harmful to the child's health or physical, mental, spiritual, moral, or social development.
  - Any activity that will cause physical relocation of households or will require the use of eminent domain.
  - Areas where Anti Encroachment Drives have been conducted.
  - Cause any displacement or severe loss of livelihood
  - Any activity with significant environmental and social risks and impacts that require an Environmental and Social Impact Assessment (ESIA).
-

All the subprojects will be screened for E&S impacts using the screening checklist provided in Annex-D: Environmental and Social Screening Checklists (for Civil Works, PGs/PAs for Livestock and Aquaculture and Mobile Unit (vehicles)). Since exact extent and precise location/footprints of individual interventions (subprojects) to be implemented under the proposed Project are not known at this stage, therefore, a framework approach has been adopted for the present E&S assessment for this ESMF. This ESMF provides screening procedure following the ESF for the type of E&S instrument to be used before implementing a subproject.

The screening criterion is based on the nature of activities and potential E&S impacts as described below:

- High-risk (H) proposed project interventions that have the potential for severe adverse environmental and social impacts that are diverse, irreversible or unprecedented. However, such type of subprojects will be avoided and not supported under the proposed Project.
- Substantial-risk (S) proposed project interventions may have the potential for adverse environmental and social impacts, but are less adverse than those of high-risk proposed project interventions. These proposed project interventions will require the preparation and submission of ESMP/RP<sup>45</sup> (Generic Template of ESMP is attached as Annex-E).
- Moderate-risk (M) proposed project interventions would have moderate levels of environmental and social impacts. These impacts are likely to be temporary and reversible and are not expected to have lasting effects on the proposed project intervention areas. For these proposed project interventions, the preparation and submission of a checklist with mitigation measures will be required. An ESMP/RP may also be prepared if needed.
- Low-risk (L) proposed project interventions will have negligible to no negative impacts, and no further environmental assessment will be needed following the initial screening process and followed by monitoring and supervision through a monitoring checklist.

Table 11 shows the SLAST subprojects environmental screening, anticipated classification and guides on preparation of relevant E&S management instrument/tool. The exact instrument will however be decided as per screening outcome of individual subproject.

The ESMPs, prepared for subprojects based on the screening criteria, will also be submitted to the World Bank for prior review and no objection. The PCMU will coordinate with Sindh Environmental Protection Agency to fulfil the legal requirements of the Sindh Environmental Protection Act 2014 for environmental approval, if required, before any project activities begun.

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<sup>45</sup> RAP/ARAP, finalized upon confirmation of project footprints.



Table 11 Subprojects Environmental and Social Screening

Project Components <sup>46</sup>	Type of Subprojects	Nature of Environmental and Social Impacts	Indicative E&S Management Instrument
<b>Component 1: Strengthening the Enabling Environment for the Sectoral Growth</b>	Rehabilitation of veterinary hospitals and clinics	Likely to have moderate to low adverse environmental and/or social impacts	ESMP/Checklist with mitigation measures
	Construction of new veterinary complexes at district level	Likely to have moderate adverse environmental and/or social impacts	ESMP/RP
	Creation of mobile dispensaries	Likely to have moderate to low adverse environmental and/or social impacts	Checklist with mitigation measures
	Provision of diagnostic laboratory services	Likely to have moderate adverse environmental and/or social impacts	ESMP/Checklist with mitigation measures
	Upscaling capacities for production of vaccines	Likely to have low to moderate adverse environmental and/or social impacts	Checklist with mitigation measures
	Production and dissemination of essential quality production inputs.	Likely to have moderate adverse environmental and/or social impacts	ESMP/Checklist with mitigation measures
	Research, development, and transfer of green technologies.	Likely to have moderate to low adverse environmental and/or social impacts	ESMP/Checklist with mitigation measures
<b>Component 2: Promotion of Climate-Smart Production, Value Addition, and Inclusive Access to Markets</b>	Capacity Building and Development of Horizontal and Vertical Alliances	Likely to have low to moderate adverse environmental and/or social impacts	Checklist with mitigation measures
	Improving the Market Integration of PGs for Increased Climate-Smart Production and Value Addition	Likely to have moderate to low adverse environmental and/or social impacts	ESMP/Checklist with mitigation measures

<sup>46</sup> Only those Components which may have E&S risks.

### 8.3. Environmental and Social Requirements in Bidding Documents

The ESMPs will be prepared based on the guidelines provided in this ESMF before the Contract award. The ESMP will be included in the bidding/ contract documents and their implementation will be a contractual binding for the Contractors. To ensure the effective implementation, the ESMP cost will be the part of BOQ.

Environmental, Social, Health and Safety (ESHS) conditions will be included in the bidding documents to ensure all mitigation measures proposed in the relevant ESMPs are effectively implemented as provided in Table 12.

Clauses related to implementation of project ESF documents (ESMF, LMP, GBV/SEAH Action Plan, SEP etc.) will be included in all project RFPs and bidding documents to ensure compliance.

**Table 12 E&S Requirements in Bidding Documents**

Condition	Rationale	Specifications to be Included in Bidding Documents
Past performance of the Contractor on E&S and OHS	The contractor's past performance on compliance with E&S and OHS considerations is an indicator of the contractor's commitment and capability for implementation of the screening checklists/ESMF/ESMP	Record of past E&S and OHS performance
The Contractor shall propose E&S Specialists in its team	The Contractor's staff should include E&S specialists who will be responsible for the implementation of the mitigation measures in compliance with the relevant instruments	The bidder will include CVs of the proposed, suitably qualified E&S Specialists
Contractor shall obtain performance bond for compliance with E&S obligations	The Contractor should have a financial implication if it fails to comply with E&S requirements.	The Contractor will obtain a performance bond
Contractor shall implement construction related mitigation measures provided in the E&S instruments	Mitigation measures from E&S instruments will be included on the tender	Tender documents will contain site-specific construction related mitigation measures
Code of Conduct for all site personnel	All workers hired by the Contractor should sign a Code of Conduct to ensure compliance with E&S requirements	The Contractor will submit a Code of Conduct with the bidding documents

### 8.4. Institutional Capacity

The Sindh L&FD will lead the implementation of the proposed Project. The L&FD has prior experience on a World Bank funded project (Sindh Agricultural Growth Project- P128307) closed in June, 2019. The project was under safeguards policies with category B and received a satisfactory rating upon completion. Currently, however, the L&FD does not have dedicated staff or resources to manage environmental or social risks associated with the proposed project. Also, the proposed Project is being processed under ESF, on which

the client needs detailed orientation and training. Hence the borrower capacity in ESF is considered low at the concept stage. A Project Coordination Management Unit (PCMU) at the level of the Secretary of L&FD will oversee most of the project's activities and will delegate implementation to the Department's relevant Directorates. Environment specialist and social specialist will be hired in PCMU to provide support to both directorates of livestock and fisheries. The project will reassess the capacity needs and staffing requirements of the project during project preparation.

### **8.5. Institutional Arrangements for E&S Implementation**

The proposed Project will be implemented at two levels: at the PCU level and at the PIU level. The project implementation mechanism will comprise a Project Coordination Unit (PCU) and a PIU based in L&FD, headed by a Project Director, and two Deputy Project Directors (Livestock Administrative and Aquaculture Administrative).

The ESMF implementation arrangements have been suggested to keep it well aligned with the overall Project implementation and institutional setup as described below:

#### **PCU Level**

The PCU will have the overall responsibility of coordinating all aspects of the project. In addition, it will involve Focal Points in the Environment Department and the social welfare Department, to facilitate the implementation of the project's technical activities, as well as ESMP requirements.

#### **PIU Level**

The PIU will include a Senior Safeguards Specialist and Gender Specialist reporting directly to the Project Director, as well as 2 each of environmental specialists, social specialist, under each of the Deputy Project Directors (Livestock Administrative and Aquaculture Administrative). The E&S staff (Environment, Social and Gender Officers) of the PIU maintain liaison with the PCU for the effective implementation of the ESMF/E&S instrument.

The E&S staff of the Project Implementation Consultant (PIC) will also support in implementation of this ESMF/E&S instruments. The E&S monitoring Checklists shall be used to monitor the implementation of ESMF/E&S instruments.

Contractors will be required to comply with the Project's E&S risk management documents and procedures including the ESMP, LMP, and local legislation. This provision will be specified in the contractor's agreements. Contractors will be expected to disseminate and create awareness within their workforce of environmental and social E&S risk management compliance for their effective implementation. However, if the Contractor fails to comply with the implementation of E&S requirements of the ESMPs, deductions will be made from the payments claimed under the heads of environmental components.

Similarly, other related aquaculture and livestock activities conducted by PGs and PAs during project implementation will ensure compliance with the E&S requirements through an Agreement with the support of PCU and PIU during project implementation.

## **8.6. Contingency Emergency Response Component**

The Contingency Emergency Response Components (CERC) Manual to be prepared for the Project will include a description of the environmental and social risk assessment and management arrangements if the CERC component becomes activated. This may include a CERC ESMF or an Addendum to this ESMF based on the subproject activities that will be funded under the CERC component. If such additional documentation or revision to documentation is needed, the PIU will prepare, consult, adopt, and disclose these in accordance with the CERC Manual, and implement the measures and actions necessary.

## **8.7. Roles and Responsibilities Entities Involved in E&S Management**

### **PCU and PIU**

- Provide support, oversight, and quality control to field staff working on environmental and social risk management;
- Review, and provide quality assurance and approval to E & S Screening and monitoring checklists and ESMPs as relevant. Keep documentation of all progress;
- Oversee overall implementation and monitoring of environmental and social mitigation and management activities, compile progress reports from subprojects, and report to the World Bank on a quarterly basis;
- Train field staff, contractors and communities who will be responsible for implementing the E&S instruments;
- Ensure that all bidding and contract documents / Agreement with PGs include all relevant E&S screening checklists and other E & S instruments;
- Ensure project activities do not fall under the Exclusion List;
- Maintain the close liaison with the World Bank, Government Departments (where applicable), E & S FPs at field level for smooth and effective implementation of E&S aspects;
- Track grievances/beneficiary feedback (in line with the SEP) during project implementation to use as a monitoring tool for implementation of project activities and environmental and social mitigation measures;
- Provide awareness and training to PGs for compliance with E&S criteria for BPs;
- Ensure the monitoring of Livestock and Aquaculture activities under the BPs of PGs for E&S compliance;
- E&S development evaluation and inclusion of mitigating measures, if required; and
- Maintain close liaison with the PGs for the E&S compliance.

If the PCU/PIU becomes aware of a serious incident in connection with the project, which may have significant adverse effects on the environment, the affected communities, the

public, or workers, it should notify the World Bank within 48 hours of becoming aware of such incident, as per the procedure defined in the LMP.

Upon completion of Project activities, the PCU/PIU will review and evaluate progress and completion of project activities and all required environmental and social mitigation measures. Especially for civil works, the PCU/PIU will monitor activities with regard to site restoration and landscaping in the affected areas to ensure that the activities are done to an appropriate and acceptable standard before closing the contracts, in accordance with measures identified in the ESMPs, other project plans or checklists. The sites must be restored to at least the same condition and standard that existed prior to commencement of works. Any pending issues must be resolved before a subproject is considered fully completed.

- **Design & Supervision Consultant (civil work)** To oversee the performance of the Contractors, through dedicated Environmental and Social Specialists, to make sure that the Contractors are complying with ESMP requirements.
- Ensuring that the day-to-day construction activities are carried out in an environmentally and socially sound and sustainable manner;
- Strong coordination with the Contractors and E&S staff- PCU/PIU;
- To supervise and monitor E & S activities being performed at site;
- To organize periodic E & S training programs and workshops for the relevant E & S staff including PIU and Contractor.
- Ensure periodic reporting of ESMP to PIU.
- Suggest any additional mitigation measures (if required).

### **Construction Contractor**

- Comply with the Project's environmental and social mitigation and management measures as specified in ESMPs and contract documents, as well as national and local legislation, in particular, the requirements of Sindh Environmental Protection Act, 2014;
- Appoint Environmental and Social Specialists for effective implementation of ESMPs;
- Take all necessary measures to protect the health and safety of workers and community members, and avoid, minimize, or mitigate any environmental harm resulting from project activities;
- Develop Site Specific Environmental and Social Management Plan (SSESMP) (only for those subprojects which may require preparation of an ESMP) with the support/consent of E&S staff of PIU and the guidelines provided in the ESMP, prior to mobilization/start of civil works; and
- Train its dedicated E & S Specialists on regular basis for effective implementation of E & S aspects.

### **Producer Groups**

- Ensure the compliance with the E&S criteria detailed under the project for BPs;
- Take all necessary measures to protect the health and safety of workers and community members, and avoid, minimize, or mitigate any environmental harm resulting from project activities;
- Maintain close liaison with the PIU for the E&S compliance.

#### **8.8. Environmental and Social Mitigation and Monitoring Plan**

Environmental and Social mitigation and Monitoring Plan, refer Table 13 will be used as the management tool for mitigation measures. The plan includes the envisaged impacts and their recommended mitigation measures and; the person/organization directly responsible for adhering to or executing the required mitigation measures and suggest frequency of monitoring the mitigation measures. Detailed E&S impacts and mitigation measures have been provided in Chapter 7.

**Table 13 Environmental and Social Mitigation and Monitoring Plan**

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
<b>Environmental Mitigation and Monitoring</b>						
1.	<p><b>Technical Design and Layout Planning</b></p> <p>Incompatible layout plan and engineering design for construction and rehabilitation activities may put workers at risk of exposure to toxic chemicals and fumes, result in equipment failure or malfunction, leading to inaccurate results or delays in analysis. Inadequate ventilation systems, improper storage of hazardous materials, and insufficient safety measures may all contribute to a hazardous working environment. The infrastructure and project workers may also potentially be impacted by natural disasters.</p>	<ul style="list-style-type: none"> <li>All these factors shall be considered in design and meet the relevant standards and guidelines;</li> <li>Ensure efficient and safe movement of workers, equipment, and materials with designated areas for sample preparation, analysis, and storage;</li> <li>Ensure adequate ventilation systems and Illumination/ lightning system;</li> <li>Laboratory should be equipped with modern and up-to-date equipment that meets the required standards;</li> <li>Ensure proper training of staff and workers, adherence to SOPs;</li> <li>Ensure careful planning while selecting the site for new construction activities and should be at appropriate distance from the sensitive receptors;</li> <li>Structures (where applicable) under the proposed subprojects shall be designed and constructed to withstand earthquake and flooding risks;</li> <li>Only shortlisted/pre-qualified Contractors shall be hired for the construction and rehabilitation works, supply of construction materials and equipment; and</li> <li>Ensure compliance with the criteria detailed under the project for the design and planning aspects (where applicable) and consider the climate smart ways in their BPs.</li> </ul>	Design Team/ consultant	As and when required basis	Confirmation of design incorporation. Stakeholder Consultation with photographic records	PIU

<sup>47</sup> For Component -3: E&S Staff of Implementing Partners will conduct monitoring on monthly basis, while the Beneficiary/Labor on daily basis. STATs will also supervise the work on a daily basis. However, for other components the monitoring frequency will be at least Monthly.

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
2.	<p><b>Procurement of Pesticides and Vaccines</b></p> <p>Procurement from uncertified sources, importation of the wrong pesticide specifications, low-quality pesticides and vaccines, adulterated pesticides and vaccines may have potential adverse impacts on the environment, human, livestock and fish. Accidental releases may occur during transportation, storage, handling from manufacturer or distributor to the project stores, or from the stores to the point of use.</p>	<ul style="list-style-type: none"> <li>• after competitive bidding process service providers shall be hired for the procurement of pesticides / medicines/vaccines/ chemicals</li> <li>• Avoid procurement of pesticides and vaccines banned by Pakistan and WHO;</li> <li>• Ensure transportation of pesticides as part of service providers responsibility through contract agreement;</li> <li>• Ensure certified/licensed drivers and dedicated transportation having safety equipment;</li> <li>• Ensure proper security of pesticides and vaccine stocks at stores and safety signage at appropriate locations;</li> <li>• Pesticides shall be stored in a cool, dry, well-ventilated area that is locked and inaccessible to irrelevant persons and kept away from heat sources, electrical equipment and avoid storing pesticides that are no longer needed;</li> <li>• Ensure compliance with the relevant FAO guidelines for pesticides and Material Safety Data Sheet (MSDS);</li> <li>• Ensure the provision of PPEs and trainings to staff/ workers;</li> <li>• Ensure proper monitoring of pesticides and vaccines stores facilities on periodic basis; and</li> <li>• Ensure safe disposal of vaccine/ pesticide empty bottles / syringes after use.</li> </ul>	Procurement Team of the Project	As and when required basis	Regular Monitoring	PIU
3.	<p><b>Soil Erosion and Contamination</b></p> <p>Construction and rehabilitation, and</p>	<ul style="list-style-type: none"> <li>• Embankments and excavated slopes will not be left untreated/unattended for long durations. The</li> </ul>	Contractor	Monthly	Visual checks and	PIU



Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
	related aquaculture and livestock activities conducted by PGs and PAs during project implementation may disturb the surrounding soil and contamination due to generation and improper handling of liquid and solid waste.	<p>excavation for the foundation will be carried out only in specified area, as per the approved engineering design;</p> <ul style="list-style-type: none"> <li>• Avoid or minimize vegetation removal/clearing;</li> <li>• Sites will be restored to their original conditions upon completion of work;</li> <li>• All the waste generated at sites shall be properly disposed at designated sites;</li> <li>• Vehicles must be properly maintained and regularly checked;</li> <li>• Avoid leaving the borrow pits unusable;</li> <li>• Hazardous waste will be kept separate and handled according to the nature of the waste;</li> <li>• Ensure the training of workforce in the storage, handling of materials and waste management. Material Safety Data Sheets (MSDS) will be strictly followed;</li> <li>• Ensure the compliance with the E&amp;S criteria detailed under the project for BPs and take all necessary measures to protect environment; and</li> <li>• Maintain close liaison with the PCMU/ relevant PMU for the E&amp;S compliance.</li> </ul>	PGS48		<p>photographic record</p> <p>Site restoration and rehabilitation.</p>	PIC
4.	<p><b>Waste Generation</b></p> <p>Wastes including discarded construction material steel, oil, fuel, empty containers and bags, excavated material and municipal waste (particularly from the construction camps, if established)</p>	<ul style="list-style-type: none"> <li>• All the wastes shall be routinely collected and safely disposed of in clearly demarcated waste disposal sites;</li> <li>• Left over construction and demolition waste materials will be reused, where applicable;</li> <li>• Construction camp (if established) will not be</li> </ul>	<p>Contractor</p> <p>PGS</p>	Monthly	<p>Visual checks and photographic record.</p> <p>Waste Management plan</p>	<p>PIU</p> <p>PIC</p>

<sup>48</sup> PGs will be responsible of the compliance of E&S requirements for activities under BPs (which may have E&S impacts) through Agreement with the Project. PCMU and PMU will ensure the monitoring of compliance on regular basis.

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
	and from and related aquaculture and livestock activities conducted by PGs and PAs during project implementation may be generated.	located within 500m of any water body; <ul style="list-style-type: none"> <li>• Site-specific Solid Waste Management Plans (SWMPs) will be developed and implemented;</li> <li>• Ensure proper disposal of wastewater through a settling tank, where requires;</li> <li>• Ensure the compliance with SEQs and IFC/WHO guidelines whichever is stringent (as advice of Environment Specialist);</li> <li>• Fuels and chemicals will be stored on concrete-floored, bounded, covered;</li> <li>• Resource conservation themes to be included in awareness raising and training sessions for project staff;</li> <li>• Ensure the compliance with the E&amp;S criteria detailed under the project for BPs and take all necessary and relevant measures for proper handling of waste; and</li> <li>• Maintain close liaison with the PCMU/ relevant PMU for the E&amp;S compliance.</li> </ul>			implementation Training Record	
5.	<b>Health Care Waste Generation</b> Inappropriate disposal of health care waste including vaccine/syringes, infectious and municipal waste from health care facilities/veterinary hospitals and e-waste may cause environmental and health risks.	<ul style="list-style-type: none"> <li>• Ensure strict compliance with the procedures specified in the Sindh Hospital Waste Management Rules 2018; and World Bank Group EHS Guidelines for Health Care Facilities, Aquaculture and Mammalian Livestock Production;</li> <li>• Auto disable (AD) syringes shall be used to avoid the spread of infections;</li> <li>• Ensure the provision of colored containers/bins with paddle along with training of health care staff/waste management workers;</li> <li>• Non-risk/municipal waste will be disposed appropriately;</li> <li>• Ensure monitoring of waste handling, storage,</li> </ul>	Designated staff of Healthcare Facilities	Monthly	Use of PPEs Regular Monitoring Compliance with SEQs, WHO/IFC Guidelines Training and Awareness records	PIU PIC

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
		<p>transportation and disposal to ensure proper implementation of waste management system;</p> <ul style="list-style-type: none"> <li>• Sharps and infectious wastes shall be transported to a dedicated waste burning facility/pit burial or incinerators (preferred option) and ensure proper disposal and complete burning;</li> <li>• Pit burial (if used) shall be lined with cement and covered with the cement slab to avoid soil and water contaminations;</li> <li>• Ensure the compliance with SEQs and WHO/IFC guidelines whichever is stringent shall be followed (as per advice of Environment Specialist);</li> <li>• Ensure provision of PPEs and trainings to workers, involved in waste management;</li> <li>• Ensure, concerned staff shall not involve in selling of health care wastes (vaccine/syringes) for profit eaning, as it further aggravates the health hazards;</li> <li>• Resource conservation themes to be included in awareness raising and training sessions for project staff; and</li> <li>• Proper disposal of E-waste by following E-waste management procedures as attached Annex- B.</li> </ul>				
6.	<p><b>Ambient Air Quality</b></p> <p>Movement of construction machinery and activities, emissions from vaccine production unit, mobile units, generators (installed in milk collection center) etc. other related aquaculture and livestock activities conducted by PGs and PAs during project implementation may contribute to deterioration of air quality.</p>	<ul style="list-style-type: none"> <li>• Vehicles and other equipment shall be kept in good working condition and be properly tuned and maintained;</li> <li>• All dust raising locations shall be kept wet with water sprinkling;</li> <li>• Construction and spoil materials will be transported in a covered truck. Impose speed limits on all vehicle movement at the worksite to reduce dust emission;</li> <li>• Road damage caused by project activities will be</li> </ul>	<p>Contractor (Responsible for the construction and rehabilitation of infrastructure: Office Buildings, Laboratories etc.)</p>	<p>Monthly</p>	<p>Visual checks Vehicle maintenance records Water sprinkling records. Training Record</p>	<p>PIU PIC</p>

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
		<p>promptly attended with proper road repair and maintenance work;</p> <ul style="list-style-type: none"> <li>• Proper Personal Protective Equipment (PPE) shall be provided to the site workers;</li> <li>• Ensure compliance with the SEQS and IFC/WHO guidelines whichever is stringent (as per advice of Environment Specialist);</li> <li>• Ensure the compliance with the E&amp;S criteria detailed under the project for BPs and take all necessary relevant measures to protect the environment; and</li> <li>• Maintain close liaison with the PCMU/ relevant PMU for the E&amp;S compliance.</li> </ul>	<p>PGs</p> <p>Designated staff of the Department / In charge of the facility (During Operation Phase)</p> <p>Note: Same implementation structure shall be followed for other impacts as well, where applicable.</p>			
7.	<p><b>Noise Pollution</b></p> <p>Noise may be generated from construction machinery, generators, offloading of materials, and construction and rehabilitation activities and mobile units, generators (installed in milk collection center) etc. and other related aquaculture and livestock activities conducted by PGs and PAs during project implementation.</p>	<ul style="list-style-type: none"> <li>• Vehicular traffic through the communities shall be avoided as far as possible;</li> <li>• Construction vehicles and machinery shall be kept in good working condition and be properly tuned and maintained;</li> <li>• Noisy construction work shall be limited to normal working hours to minimize disturbance to nearby communities, avoid excessive use of horns and vehicle speeds will be kept low;</li> <li>• PPEs shall be provided and worn by the project staff and training them in their use;</li> <li>• Vehicles and equipment shall be maintained regularly;</li> <li>• Ensure the compliance with SEQS and IFC/WHO</li> </ul>	<p>Contractor</p> <p>PGs</p>	<p>Monthly</p>	<p>Regular monitoring</p> <p>Vehicle and equipment maintenance records</p> <p>Training records</p> <p>GRM Record</p>	<p>PIU</p> <p>PIC</p>

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
		<p>guidelines whichever is stringent (as advice of Environment Specialist). Ensure the effective implementation of GRM;</p> <ul style="list-style-type: none"> <li>• Ensure the compliance with the E&amp;S criteria detailed under the project for BPs and take all necessary relevant measures to protect the environment; and</li> <li>• Maintain close liaison with the PCMU/ relevant PMU for the E&amp;S compliance.</li> </ul>				
8.	<p><b>Solarization of Facilities</b> Visual effects, generation of small amount of waste, damages to plumbing and electric wiring, and roof leakage, wear and tear on the roof risks may arise during installation of solar panel.</p>	<ul style="list-style-type: none"> <li>• Only shortlisted/pre-qualified service providers should be hired for the supply of solar systems;</li> <li>• Supporting structure will need to be designed adequately to avoid any damage during the wind storms;</li> <li>• Lead/acid/cadmium-based batteries will not be procured for solarization;</li> <li>• Ensure panels are treated with anti-reflective coating which reduces the sun's reflection from PV panels;</li> <li>• Ensure that no waste material left behind after the completion of work; and</li> <li>• Ensure the compliance with the relevant above measures if the BPs involve solarization.</li> </ul>	<p>Design Consultant  Contractor  PGs</p>	<p>Monthly</p>	<p>Regular monitoring Use of PPEs</p>	<p>PIU PIC</p>
<p>Flora and Fauna (Ecological and Biodiversity) Mitigation and Monitoring</p>						
9.	<p><b>Clearing and damage to native vegetation and introduction of exotic species</b> During construction and rehabilitation works there is also risk of planting of exotic plants and tree species such as Conocarpus and Eucalyptus species in the</p>	<ul style="list-style-type: none"> <li>• No interventions shall be carried out in any natural and critical habitats. Moreover, the Contractor will ensure that any surplus construction waste shall not be disposed of in close proximity to the natural and critical habitats;</li> <li>• Workers shall be strictly directed not to damage any nearby agriculture land/vegetation/trees;</li> <li>• Sites, for the installation of construction camps (if</li> </ul>	<p>Contractor</p>	<p>Monthly</p>	<p>Regular monitoring, Departmental consultations record Training record</p>	<p>PIU</p>

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
	cleared areas.	<p>required) and mobility of construction machinery shall be properly planned to avoid or minimize the cutting of trees/shrubs/herbs and loss of agriculture land; and</p> <ul style="list-style-type: none"> <li>• Compensatory plantation of native species shall be carried out with a ratio of five trees for each tree felled/damaged. Forest and Wildlife Departments shall be consulted to fulfill the legal requirements, where applicable.</li> </ul>				
10.	<p><b>Hunting, Poaching and Accidental Mortalities of Wildlife</b> Risk of hunting, poaching and killing mainly for protection of fish stock, illegal trade and meat of migratory birds, Smooth Coated Otters and Freshwater Turtles.</p>	<ul style="list-style-type: none"> <li>• Actively engage the Sindh Wildlife Department and Conservation NGOs for technical and regulatory support to conserve the project areas and help communities to play their positive role;</li> <li>• Include wildlife conservation, protection and habitat improvement in the TORs of the farmers' groups and their agreements with the SLAST Project to legally bind them to protect and conserve wildlife including migratory water fowl, other birds, otters and freshwater turtles in and around their respective ponds.</li> <li>• Support the Farmers Groups in activities like planting and regeneration of suitable native species of trees and plants around the aquaculture ponds as well as blank spaces in the surrounding areas to improve the natural habitat.</li> <li>• Organize awareness, education and trainings for farmers and project staff to reduce risks of hunting, poaching and killing of wildlife species in their areas. A comprehensive campaign should be developed and implemented in partnerships with the Sindh Wildlife Department and Conservation NGOs like WWF-Pakistan.</li> </ul>	PGs	Monthly / As and when required basis	Regular monitoring, Departmental consultations record Training record	PIU

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
		<ul style="list-style-type: none"> <li>• Sign boards and safe wildlife crossings along roads and highways: Where fish ponds are situated nearby or along the roads proper sign boards should be provided indicating wildlife crossing areas and speed limit. Where possible the project should provide culverts as safe crossings/ passage ways for wildlife especially turtles and otters.</li> </ul>				
11.	<p><b>Use of Lethal Drugs and Pesticides Resulting in Mortality of Wildlife</b></p> <p>There is risk of using lethal drugs for wildlife especially vultures. These include Non-Steroidal Anti-inflammatory Drugs (NSAIDs) such as Diclofenac, Aceclofenac, Ketoprofen and Flunixin. These drugs are responsible for 99% decline in population of the three critically endangered vulture species across south asia including Pakistan. Vultures feed on carcasses of dead animals and those treated with the aforementioned lethal drugs case mortality in vultures.</p>	<ul style="list-style-type: none"> <li>• Develop and implement comprehensive awareness and education campaigns: to enhance awareness and education among the veterinary practitioners, farmers, and communities about the lethal and toxic drugs, chemicals and pesticides, their negative impacts on humans, biodiversity and ecosystems, and use of safe alternatives and practices. The campaign should consist of awareness sessions, visits, awareness print material in local language (leaflets, guides, manuals), exposure visits and trainings.</li> <li>• Promote use of safe drugs and pesticides: Meloxicam (an NSAID drug proved safe for vultures) should be promoted in livestock veterinary treatment practices. For fish fungal diseases less toxic pesticides such as Acetamiprid (a less toxic to aquatic life than Cypermethrin) should be promoted and used.</li> </ul>	<p>Veterinary practitioners</p> <p>Farmers</p>	<p>Monthly / As and when required basis</p>	<p>Regular monitoring, Departmental consultations record</p> <p>Training record</p>	PIU
12.	<p><b>Disease Transmission from Livestock to Wildlife</b></p> <p>There have been some incidences of disease transmission to wildlife (Viral disease from goats/ sheep to Ibex in Kirthar National Park and domestic poultry to Wild Peacocks</p>	<ul style="list-style-type: none"> <li>• Regular monitoring of livestock diseases, timely treatment and vaccinations;</li> <li>• Ensure that infected animals are quarantined and are not taken to rangelands and pastures especially areas falling adjacent to protected areas and other ecologically sensitive areas</li> </ul>	<p>Veterinary practitioners</p> <p>Farmers</p>	<p>Monthly / As and when required basis</p>	<p>Regular monitoring, Departmental consultations record</p> <p>Awareness record</p>	PIU

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
	<p>in Tharparker). Risk of disease transmission to wildlife can happen in case infected animals and birds from project areas move to rangelands.</p>					
13.	<p><b>Introduction of Alien Invasive Fish Species</b>                      Introduction of alien invasive fish species may affect the native species by preying on and competing with them for food, breeding sites and altering habitat. Alien invasive species may introduce new diseases or parasites to the fish pond, negatively affecting the health of native species. Some alien invasive species may contribute to water quality issues by producing excess nutrients or disrupting nutrient cycling, leading to problems such as eutrophication and algal blooms. The presence of alien invasive species may have economic consequences for fish farmers, as they may cause declines in the production of desired fish species or result in increased costs for disease control and management. alien invasive species from fish ponds may escape into natural water bodies through various means, including flooding or intentional releases,</p>	<ul style="list-style-type: none"> <li>• Implement effective screening methods to prevent the entry of alien invasive fish species into fish ponds. Ensure regular monitoring of incoming stock for any signs of invasive species;</li> <li>• Establish a quarantine area for new fish stock to prevent the accidental introduction of invasive species. Quarantine should include a thorough inspection and observation period to detect and address any potential issues before introducing fish to the main pond;</li> <li>• Educate pond owners, workers, and surrounding communities about the risks of invasive species and their alternatives;</li> <li>• Choose native or non-invasive species for aquaculture to minimize the risk of unintended introductions;</li> <li>• Maintain ecologically safe distance of the ponds from natural water bodies: The project supported aquaculture ponds should preferably be at ecologically safe distance from natural water bodies.</li> <li>• Promote improved design and structure of the aquaculture ponds to reduce the risk of flood damage, and submerging in floodwater.</li> <li>• Establish a reporting system for suspected cases of invasive species to facilitate prompt response, and.</li> </ul>	PGs	Monthly / As and when required basis	Regular monitoring, Departmental consultations record Awareness record	PIU



Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
	leading to the spread of the invasive species and further ecological disruptions in natural ecosystems.	<ul style="list-style-type: none"> <li>• Impose penalties for non-compliance to encourage responsible practices;</li> </ul>				
14.	<p><b>Impact on Water and Land Resources</b></p> <p>The extraction of water for fish ponds may impact water resources by reducing both quantity and quality. The discharge of effluents from fish ponds into surrounding water bodies introduces excess nutrients, organic matter, and potentially chemical residues (used in aquaculture practices to treat the disease). This discharge may result in nutrient enrichment and eutrophication, leading to the growth of algae and aquatic plants, and subsequently, depletion of oxygen levels, negatively impacting the health of aquatic ecosystems. Aquaculture ponds may cause waterlogging and salinity especially in low lying and poorly drained areas leading to damage to fertile land, habitats, flora and fauna.</p>	<ul style="list-style-type: none"> <li>• Careful site selection for fish ponds, considering factors like water availability, local hydrology, and environmental impacts, shall minimize the stress on water resources;</li> <li>• Implementing effective effluent treatment systems before discharging pond water into natural water bodies helps reduce the introduction of pollutants and excess nutrients, mitigating the risk of eutrophication;</li> <li>• Promoting the reuse of water within fish farm operations helps to minimize the overall demand for freshwater. Pumping and application of saline groundwater in ponds should be discouraged specifically in agriculture areas where canal water is available.;</li> <li>• Promote proper design and drainage system of the aquaculture farms to reduce, seepage from the ponds, This will also help reduce water losses from ponds and will help overcome the issue of water shortage.</li> <li>• Engaging local communities and other relevant stakeholders to raise awareness on sustainable water management practices; and</li> <li>• Ensure the compliance with SEQ and /or WHO/IFC guidelines whichever is stringent.</li> </ul>	PGs	Monthly / As and when required basis	<p>Regular monitoring, Awareness record</p> <p>Compliance with SEQ and /or WHO/IFC guidelines (where applicable/ as per advice of Environmental Specialist)</p>	PIU
<b>Social Mitigation and Monitoring</b>						
15.	<p><b>Occupational Health and Safety (OHS) risks</b></p>	<ul style="list-style-type: none"> <li>• Strictly follow Sindh Occupational Safety and Health Act, 2017 and World Bank Group EHS</li> </ul>	Contractor	Monthly	Implementation of OHS Plan.	PIU

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
	<p>unsafe and unhealth working conditions, risk incident and accident during the construction and rehabilitation activities during installation of contractor camps (if established<sup>49</sup>), deep excavations, steel fixing, installation of a batching plant, concrete pouring, installation of solar panels, movement of project vehicles and equipment, manual handling during loading-unloading operation, fire hazard, during immunization (vaccines/syringes), exposure to chemicals (fertilizers and pesticides) to treat or control the diseases, exposure to water borne disease, exposure to diseases from animals, bad housekeeping, inappropriate collection, storage, transportation and disposal of hazardous waste, risk of drowning in fish ponds, installation of medical equipment, lack of compliance with local OHS rules and regulations, risks of GBV/SEA/SH, child labor and forced labor.</p>	<p>Guidelines, 2007 (relevant to the project). Prepare and implement the site-specific OHS Plan;</p> <ul style="list-style-type: none"> <li>• Ensure the compliance with the World Bank Group EHS Guidelines for Aquaculture, Mammalian Livestock Production and Health Care Facilities;</li> <li>• Ensure compliance with the Worker’s Code of Conduct provided in the LMP;</li> <li>• Ensure that the site will be restricted for the entry of irrelevant people and appropriate safety signs at site;</li> <li>• Ensure the provision of fire prevention and firefighting equipment;</li> <li>• Ensure the provision of PPEs to all workers, visitor and compliance with SEQS, 2016.</li> <li>• Ensure the training of workers in health and safety procedures, use of PPEs, defensive driving, provision of first aid, emergency prevention, preparedness and response arrangements by the Contractor;</li> <li>• Include procedures for documenting and reporting accidents, diseases, and incidents as per the procedure defined in LMP;</li> <li>• Identify and minimize, so far as reasonably practicable, the causes of potential hazards to workers, including communicable diseases such as HIV/AIDs and vector borne diseases;</li> <li>• Awareness and training program shall be conducted regarding pest management, sustainable use of fertilizers, safe disposal of</li> </ul>	PGs	Designated staff of the Department / In charge of the facility	<p>Use of PPEs. Training Records. Work permits Implementation of Emergency Response Procedures Implementation of GRM Accident/Incident reported. LMP</p>	PIC (during supervision of civil works of infrastructure the by Contractor)

<sup>49</sup> Mostly the local labor would be hired due to small scale civil works. Establishing regular construction camps by the contractor(s) is unlikely. However, given measures would be taken, if needed

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		<ul style="list-style-type: none"> <li>empty containers; and</li> <li>The infrastructure shall be equipped with appropriate safety equipment.</li> </ul>				
16.	<p><b>Community Health and Safety</b></p> <p>Exposure to dust and noise, accidents/incidents, physical injuries due to falls in excavated sites, exposure to hazardous materials, inappropriate disposal of liquid, solid wastes, SEA/SH, spread of animal diseases, food safety, effects of water resources, salinization of neighboring agriculture land, drowning. Conflicts between the locals and the workers, spread out of communicable disease during project implementation.</p>	<ul style="list-style-type: none"> <li>Ensure compliance with site specific community health and safety plan;</li> <li>Ensure that the site will be restricted for the entry of irrelevant people and use appropriate safety signs at the sites;</li> <li>Ensure the compliance with the World Bank Group EHS Guidelines for Aquaculture, Mammalian Livestock Production and Health Care Facilities;</li> <li>Ensure the compliance with the mitigation measures provided for air, noise and waste management;</li> <li>Vehicle limit shall be kept low and horns will not be used while passing through or near the communities;</li> <li>Effective implementation of GRM will be ensured to timely address the issues;</li> <li>Ensure due care of the local community and observe sanctity of local customs and traditions;</li> <li>Training and awareness sessions will be conducted regularly.</li> <li>Food safety guidelines will be provided to PGs and PAs by the project, and the same will be monitored during project lifetime.</li> </ul>	<p>Contractor</p> <p>PGs</p> <p>Designated staff of the Department / In charge of the facility</p>	<p>Monthly</p>	<p>Implementation of CH&amp;S Plan.</p> <p>Community Concerns Record.</p> <p>Training Records.</p> <p>Implementation of GRM</p> <p>Accident/Incident reported.</p>	<p>PIU</p> <p>PIC</p>
17.	<p><b>Security Issues</b></p> <p>Security risks may arise during the implementation of project activities, particularly in remote regions and regions with known security and law and order issues (e.g. kacha).</p>	<ul style="list-style-type: none"> <li>Project will continue to rigorously engage with the local communities;</li> <li>Maintain communication through employer with local police and law enforcement agencies and inform about construction activities particularly for sensitive areas;</li> </ul>	<p>Contractor</p>	<p>Monthly</p>	<p>Regular Monitoring</p> <p>Implementation of Security Plan</p> <p>Consultation with Security</p>	<p>PIU</p> <p>PIC</p>

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
		<ul style="list-style-type: none"> <li>• Prepare emergency evacuation procedure and display emergency contact numbers;</li> <li>• A detailed Security Management Plan will be developed by the project and by the Contractor as part of Site specific ESMP (where applicable); and</li> <li>• Ensure the effective implementation of GRM.</li> </ul>			Agencies	
18.	<p><b>Gender Base Violence (GBV)</b> Risks may arise for women and children (especially of minorities), other vulnerable groups and project staff during project implementation, particularly during the civil works and technical assistance activities, significant contact between Project workers and beneficiary communities, and training and during selection of women beneficiaries/PGs.</p>	<ul style="list-style-type: none"> <li>• Ensure compliance with GBV/SEA/SH Action Plan;</li> <li>• Ensure the effective implementation of GRM.</li> <li>• Labor and or other staff will be educated and made aware of the civil, social, and legal rights of women and vulnerable groups and about the actions taken in the event of GBV and SEA/SH.</li> <li>• Awareness session will be conducted regularly for community and workers through skilled trainers/ service providers.</li> <li>• Targeted communications and awareness to women regarding potential SEA / GBV risks, especially as literacy rates amongst women are lower.</li> <li>• Project staff (skilled and unskilled) will sign the code of conduct before commencement of civil works.</li> <li>• Service providers will be identified and mapped to address SEA/SH issues.</li> <li>• Provision related to SEA/SH or GBV will be incorporated in the bidding document of the Contractor and Local Service Providers (LSPs).</li> </ul>	Contractor  PGs	Monthly	Regular Monitoring Grievance Record Training and awareness Record Compliance with GBV/SEA/SH Action Plan Implementation	PIU  PIC
19.	<p><b>Force/Child Labor</b> Project activities may involve the use of child forced/child labor.</p>	<ul style="list-style-type: none"> <li>• Hiring children below the age of 14 for any type of labor, and below the age of 18 for hazardous work will be prohibited;</li> <li>• Ensure regular monitoring to check for child labor and will hold regular consultations to keep a check on forced labor. Follow the provincial labor laws and World Bank requirements during hiring the</li> </ul>	Contractor  PGs  LSPs	Monthly	Regular Monitoring Grievance Record Compliance with LMP	PIU  PIC

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
		labor force; and • Awareness will be created among the local communities and project staff.				
20.	<b>Targeting, Social Exclusion and Elite Capture</b> Risk of social exclusion and elite capture. Women, vulnerable groups and historically underserved communities may fail to benefit from and be excluded from activities. This risk can be compounded by elite capture by large/influential farmers and selection bias in preliminary surveys to identify target villages, members of producer groups, and buyers and market enablers to be part of PAs.	• At least 30% of Women beneficiaries will be ensured in livestock activities. Given that women do not participate in fish farming, backyard fish farming will be introduced under the aquaculture activities; • All project staff with functions related to recruitment will be trained on social inclusion and the relevant government and Bank regulations; • Tailored TA for female-headed PGs that will include business leadership networking support to enable them to access markets and manage business operations; • Specific application window for female-headed PGs. In addition to receiving tailored support for forming and registering PGs, female-headed PGs will be able to apply for technical and financial support for the implementation of their BPs under conditions designed to help address the specific market failures faced by women in the livestock and aquaculture sectors. • Training module designs to consider ways to improve gender inclusion in terms of the training's content and delivery mechanisms; • Identify traditional fishing communities (Mohana) and ensure they have free and fair access to project benefits; • Accessibility of awareness campaigns, materials and trainings for the illiterate and disabled (hearing and visually impaired);	Relevant Project Staff  PGs	Monthly/ As and when required basis	Grievance Record, Compliance with SEP  Compliance with Project Criteria for beneficiaries	PIU

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		<ul style="list-style-type: none"> <li>• Ensure that only the genuine beneficiaries are enlisted for the project support.</li> <li>• Conduct regular beneficiary feedback surveys to assess targeting and inclusion of project activities</li> <li>• Ensure an accessible and effective Grievance Redressal Mechanism</li> <li>• Ensure the project Stakeholder Engagement Plan (SEP) is implemented throughout the project lifetime.</li> </ul>				
21.	<p><b>Lack of Meaningful Community Engagement</b> Vulnerable groups and communities may be excluded from stakeholder consultations, limiting their ability to provide feedback on project design and impacts, and potentially preventing them from fully benefiting from the project.</p>	<ul style="list-style-type: none"> <li>• A comprehensive Stakeholder Engagement Plan (SEP) has been developed and will be implemented during course of project;</li> <li>• Mapping and engaging stakeholders, including vulnerable groups at the start of the design process and obtaining their feedback about project interventions;</li> <li>• PCMU and PMU dedicated staff will be responsible for the implementation of the SEP and GRM; and</li> <li>• Project staff will be trained on social inclusion and stakeholder engagement.</li> </ul>	Relevant Project Staff	Monthly/ As and when required basis	Grievance Record, Compliance with SEP Training record	PIU
22.	<p><b>Chance Findings of Important Physical and Cultural Resources</b> Project may encounter the chance finding of important physical cultural resources during the implementation.</p>	<ul style="list-style-type: none"> <li>• Subprojects sites will be screened prior to commencement of civil work and other project activities conducted by the PGs and Pas (where applicable);</li> <li>• Ensure the compliance with the chance find procedure, Provided in Annex-C.</li> </ul>	Contractor PGs	Monthly	Visual Monitoring Compliance with Chance find Procedures	PIU PIC
23.	<p><b>Exclusion Risks to Women</b> Low participation of women in farming-related decision-making processes further deprives women producers from accessing</p>	<ul style="list-style-type: none"> <li>• At least 30% of Women beneficiaries will be ensured.</li> <li>• All project staff with functions related to recruitment will be trained on social inclusion and the relevant government and Bank regulations.</li> </ul>	Relevant Project Staff PGs	Monthly / As and when required basis	Grievance Record, Compliance with SEP Compliance with Project Criteria	PIU

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
	<p>innovations, extension services, entrepreneurship training, and technologies, which ultimately limits their potential to grow and increase their incomes in livestock and aquaculture. Women may also face cultural hurdles in accessing Farmer Field Schools and extension services. Low ownership of CNICs by women may further compound these risks as they are unable to register for project benefits or access banking channels required to receive grants under Component 2. The risk of exclusion of women is particularly relevant for livestock producers where women are predominantly responsible for the majority of livestock rearing, feeding, milking and dairy processing activities, but are not directly involved in market activities and do not manage the cash transactions or directly receive revenues.</p>	<ul style="list-style-type: none"> <li>• Tailored TA for female-headed PGs that will include business leadership networking support to enable them to access markets and manage business operations.</li> <li>• Training module designs to consider ways to improve gender inclusion in terms of the training's content and delivery mechanisms.</li> <li>• Identify traditional fishing communities and ensure they have free and fair access to project benefits.</li> <li>• Accessibility of awareness campaigns, materials and trainings for women.</li> <li>• Conduct regular beneficiary feedback surveys with women to assess targeting and inclusion of project activities.</li> <li>• Ensure an accessible and effective Grievance Redressal Mechanism</li> <li>• Ensure the project Stakeholder Engagement Plan (SEP) is implemented throughout the project lifetime.</li> <li>• Project will support a dedicated application window for female-headed PGs;</li> <li>• Given that backyard poultry rearing, and backyard fish farming are typically managed by women, the project will support female-headed PGs to present BPs for such activities, even though they are outside of the project's target sub-sectors.</li> <li>• Project will also provide preferential conditions for female-led PGs by lowering the expected levels of financial matching (i.e., 10 percent vs 25 percent for other groups), and by lifting the requirement of identifying a formal commercial agreement with a buyer.</li> </ul>			for beneficiaries	

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
		<ul style="list-style-type: none"> <li>Project will track the number of PA BPs approved and funded for female-led PGs to monitor the narrowing of gender gaps.</li> </ul>				
24.	<p><b>Land Acquisition and Involuntary Resettlement</b></p> <p>There is no acquisition of private lands expected under the project. Construction for majority of activities will be on existing Livestock and Fisheries Department complexes and land. Construction of district level veterinary complexes may require additional government lands which will be acquired through the DC. Additionally, the civil works on expansion of existing and construction of new facilities may result in the removal of informal settlers and encroachers. Under Component 2, milk collection centers for PGs will be established within villages on community donated land.</p>	<ul style="list-style-type: none"> <li>As the locations for the civil works and milk collection centers are not known, a Resettlement Framework as per World Bank ESS5, including a Voluntary Land Donation Framework will be prepared by the project.</li> </ul>	Local Government with the support of dedicated project staff	Monthly / As and when required basis	Regular Monitoring Compliance with Resettlement Framework	PIU
25.	<p><b>Cold Chain Management for Vaccine Effectiveness</b></p> <p>Vaccines need to be stored at recommended temperatures to remain effective. Failure to maintain the required temperature can result in a loss of vaccine potency, rendering them ineffective.</p>	<ul style="list-style-type: none"> <li>Vaccines shall be stored at standard temperatures (+2C° to +8C°);</li> <li>Regularly maintain and calibrate refrigeration and freezing equipment to ensure they operate within the required temperature ranges;</li> <li>All health care facilities shall backup electric supply to ensure the required standard temperature for vaccination storage;</li> </ul>	Dedicated staff of the department/ In-charge of Facility	Monthly / As and when required basis	Temperatures Installation of Solar refrigerators Trained staff Training records Use of PPEs	PIU



Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
		<ul style="list-style-type: none"> <li>• Standard stock ledger with name of the vaccine, quantity in doses, vial size, manufacturer, expiry date, batch/lot number, date of receive and supply to be maintained at all level and updated regularly;</li> <li>• Reconstituted vaccine must be discarded after the specific timeframe provided by the manufacturer, where applicable;</li> <li>• Ensure the provision of appropriate PPE to workers and other health staff;</li> <li>• Provision of trainings on vaccine Administration &amp; Management to be provided to health staff; and</li> <li>• Develop and implement contingency plans for potential cold chain failures, including protocols for transferring vaccines to alternative storage facilities in case of equipment malfunctions; and</li> <li>• Provide training to personnel involved in the cold chain, including handlers, transporters, and vaccination administrators, on the importance of maintaining proper temperature conditions.</li> </ul>				
26.	<p><b>Impact of Disease Outbreak</b></p> <p>Disease outbreak may lead to significant mortality rates among the fish population and result in substantial economic losses for fish farmers.</p>	<ul style="list-style-type: none"> <li>• Establish and enforce strict biosecurity measures to prevent the introduction and spread of diseases;</li> <li>• Implement a quarantine period for new fish stock before introducing them to the main pond. This allows for the observation of any signs of disease and prevents the introduction of pathogens to the healthy population;</li> <li>• Regularly monitor the health of the fish population. This involves routine visual inspections, as well as periodic health assessments by trained professionals of the Department. When applicable, use vaccines to immunize fish against specific diseases;</li> </ul>	<p>PGs with support from Dedicated staff of the department</p>	<p>Monthly / As and when required basis</p>	<p>Regular monitoring Emergency response procedures Training records</p>	<p>PIU</p>

Sr. No.	Project Impacts	Mitigation Measure	Implemented by	Monitoring Frequency <sup>47</sup>	Performance Monitoring Indicators	Monitored By
		<ul style="list-style-type: none"> <li>• Maintain optimal water quality parameters, as poor water quality can stress fish and make them more susceptible to diseases. Regularly test and monitor parameters such as dissolved oxygen, pH, temperature, and ammonia levels;</li> <li>• Provide a balanced and nutritious diet for the fish to enhance their immune system;</li> <li>• Develop and implement an emergency preparedness plan that includes protocols for disease outbreaks; and</li> <li>• Educate fish farmers, workers, and stakeholders about the importance of disease prevention and biosecurity measures.</li> </ul>				

## **8.9. Monitoring**

Monitoring will be carried out to ensure that the mitigation plans are regularly and effectively implemented. It will be performed at PIU, field level levels and by the design & supervision consultant (civil work) (contractor has to implement the screening checklist obligations). Two complementary methodology approaches are being applied to monitor the proposed actions under the ESMF:

Compliance monitoring; which checks whether the actions proposed by the ESMF/ E&S Instruments have been carried out by visual observation, photographic documentation and the use of checklists prepared for the ESMF; and Effects monitoring; which records the consequences of program activities on the biophysical and social environment; as applicable, these effects are repeatedly measured by applying selected indicators.

A separate monitoring checklist will be developed by PIU based on the ESMPs, which will be used by field monitor on during the execution of civil works and operationalization of established collection centers and meat fattening farms.

The PIU E&S Officers (or with the support of E&S FPs at district level) will conduct monthly/ fortnightly site inspections, for livestock and aquaculture related activities conducted by PGs/PAs during implementation, at district level and verify that the E&S measures are effectively implemented at working sites and will provide guidance and training to the PGs/PAs in case of any noncompliance. The monitoring checklist is provided in Annex-F.

## **8.10. Reporting and Documentation**

At a minimum, the reporting will include (i) the overall implementation of E&S risk management instruments and measures, (ii) any environmental or social issues arising as a result of project activities and how these issues will be remedied or mitigated, including timelines, (iii) Occupational Health and Safety performance (including incidents and accidents), (iv) community health and safety, (v) stakeholder engagement updates, in line with the SEP, (vi) public notification and communications, (vii) progress on the implementation and completion of project works, and (viii) summary of grievances/beneficiary feedback received, actions taken, and complaints closed out, in line with the SEP. Reports from the field levels will be submitted to the PCU, where they will be aggregated and submitted to the World Bank on a quarterly basis.

## **8.11. Training and Capacity Building**

To ensure the successful implementation of ESMF and compliance of the E&S mitigation measures, strengthening capacity of project staff and workers is essential. This will achieve through series of customized trainings and awareness sessions. Table 14 below provides capacity building / training framework for the proposed project.

**Table 14 Capacity Building and Training Framework**

Sr. No.	Key Aspects to Cover	Potential Participants	Frequency of Training	Responsible Party
1	<ul style="list-style-type: none"> <li>• ESF and implementation of Environmental and social instruments</li> <li>• Stakeholder engagement and Grievance Redress Mechanism (GRM), including GRM for SEA/SH</li> <li>• GBV/SEA/SH</li> <li>• Resettlement and Land acquisition</li> <li>• Labor Management</li> <li>• Community and occupational health and safety aspects</li> <li>• Resource Efficiency and Pollution Prevention and Management</li> <li>• Environmentally friendly construction techniques and materials</li> <li>• Biodiversity conservation related topics</li> </ul>	<p>E&amp;S FPs at Field Level, Project Workers, project staff (as a capacity building measures).</p> <p>Contractor staff,</p>	At the start of the project implementation and refreshers on annual basis / as and when required basis	Capacity Building Consultant, PIU with the support from E&S staff and PIC
2	<ul style="list-style-type: none"> <li>• Occupation Health and Safety (OHS)</li> <li>• Community Health and Safety (CHS)</li> <li>• Prevention of Gender based Violence/SEA/SH</li> <li>• Reporting on incidents and accidents and emergency preparation and response preparedness</li> <li>• Stakeholder mapping and engagement</li> <li>• Sensitize and aware project women beneficiaries on financial and technical assistance</li> <li>• Grievance Mechanism especially for GBV/SEA/SH</li> <li>• Biodiversity aspects</li> <li>• Labor Management</li> <li>• Pollution prevention and Control</li> <li>• Integrated Pest Management</li> <li>• Emergency Response Procures</li> </ul>	<p>All Project workers (including for construction works such as contractors, PICs and community workers)</p> <p>Project beneficiaries</p>	Throughout Project implementation, including when new workers are engaged.	Capacity Building Consultant, PIU with the support from E&S staff and PIC

### 8.12. ESMF Disclosure

The ESMF and other E&S instruments after review and clearance from the bank will be disclosed on the official website of project, and shall also be available in World Bank repositories. Executive summaries of each instrument will be translated into Urdu and Sindhi and will also be made available. A copy of the GRM will be placed in the PMU for public access. The GRM will be translated into regional languages i.e., Urdu and Sindhi.

### 8.13. Tentative ESMF Implementation Budget

Table 8.6 presents the estimated cost of ESMF implementation. This tentative cost will be included in the overall project cost. This cost will be reviewed and firmed up when the project footprints will be finalized at subproject level to ensure realism. Additional costs could be included in the subproject specific ESMPs that would become part of each bidding/BOQ documents. The Contractor(s) however shall be paid against the actual execution with evidential proof of relevant E&S instruments activity.

**Table 15 Estimated Budget**

Item	Frequency/Quantity	Estimated Cost (Million- PKR)	Remarks
E&S Staff for PIU Project Directorate	02	43.2	300,000 PKR per Month Two Specialists (Senior Safeguards, and Gender) for 6 years.
E&S Staff for PIU	Total 04	57.6	200,000 PKR per Month Four E&S Officers (Environmental and Social, 2 for each Deputy Project Director) for 6 years in PIU Deputy Project Directorates
Trainings and Capacity Building	15	30	15 trainings at 2, 000,000 PKR per trainings and Capacity Building Session
Biodiversity Conservation Measures	Lump sum	154	
ESMP Preparation Cost	Lump sum	20	
GRM Implementation Cost	Lump sum	3	-
Implementation Cost of GBV/SEA/SH Action Framework	Lump sum	4	-
PPEs Cost and Fire Safety Equipment Cost	Lumps sum	30	
Supervision Cost	Lump sum	150	To monitor the E&S aspects in the field.
Third party Audit/Monitoring	Annual	9	Lump sum
<b>Total</b>		<b>500.8</b>	The cost shall be updated based on the current market prices during project implementation.

## Annex A – Key Wildlife Species of Conservation Concern and Their Protection Status Under the Sindh Wildlife Protection Act

### Wildlife Species of Conservation Concern

S. No.	Species	Scientific name	Conservation Status
<b>A. Mammals</b>			
1	Hog Deer	<i>Axis porcinus</i>	Endangered
2	Blue Whale	<i>Balaenoptea musculus</i>	Endangered
3	Indus Dolphin	<i>Platanista minor</i>	Endangered
4	Humpback Whale	<i>Megaptera novaeangliae</i>	Endangered
5	Indian Pangolin	<i>Manis crassicaudata</i>	Endangered
6	Sindh Ibex	<i>Capra aegagrus</i>	Vulnerable
7	Urial	<i>Ovis vignei</i>	Vulnerable
8	Smooth - Coated Otter	<i>Lutrogale perspicillata</i>	Vulnerable
9	Fishing Cat	<i>Prionailurus viverrinus</i>	Vulnerable
10	Finless Porpoise	<i>Neophocaena phocaenoides</i>	Vulnerable
11	Leopard	<i>Panthera pardus</i>	Vulnerable
12	Humpback Dolphin	<i>Sousa plumbea</i>	Near Threatened
13	Wild Ass	<i>Equus hemionus</i>	Near Threatened
<b>B. Birds</b>			
1	Indian Whitebacked Vulture	<i>Gyps bengalensis</i>	Critical
2	Indian (Long billed) Vulture	<i>Gyps indicus</i>	Critical
3	Sociable Lapwing	<i>Vanellus gregarious</i>	Critical
4	Redheaded Vulture	<i>Sarcogyps calvus</i>	Critical
5	Great Indian Bustard	<i>Choriotis nigriceps</i>	Endangered
6	Egyptian Vulture	<i>Neophron percnopterus</i>	Endangered
7	Leekh or Lesser Florican	<i>Sypheotides indica</i>	Endangered
8	Cinereous Vulture	<i>Aegyptius monachus</i>	Endangered
9	Greater Adjutant	<i>Leptoptilos dubius</i>	Endangered
10	Dalmatian Pelican	<i>Pelecanus crispus</i>	Vulnerable
11	Marbled Teal	<i>Marmaronetta angustirostris</i>	Vulnerable
12	Pallas's Fishing Eagle	<i>Haliaeetus leucorhynchus</i>	Vulnerable
13	Sarus Crane	<i>Grus antigone</i>	Vulnerable
14	Houbara Bustard	<i>Chlamydotis undulata</i>	Vulnerable
15	Jerdon's Babbler	<i>Chrysomma altirostre</i>	Vulnerable
16	Imperial Eagle	<i>Aquila heliaca</i>	Vulnerable
17	Greater Spotted Eagle	<i>Aquila clanga</i>	Vulnerable
18	Lesser White-fronted Goose	<i>Anser erythropus</i>	Vulnerable
19	Darter	<i>Anhinga rufa</i>	Near Threatened
20	Ferruginous Duck	<i>Aythya nyroca</i>	Near Threatened
21	Black necked Stork	<i>Ephippiorhynchus asiaticus</i>	Near Threatened
22	Painted Stork	<i>Ibis leucocephalus</i>	Near Threatened
23	Lesser Flamingo	<i>Phoenicopterus minor</i>	Near Threatened
24	Blackbellied Tern	<i>Sterna acuticauda</i>	Near Threatened
25	Pallid Harrier	<i>Circus macrourus</i>	Near Threatened
26	Laggar Falcon	<i>Falco jugger</i>	Near Threatened
27	European Roller	<i>Coracias garrulous</i>	Near Threatened
28	Rufousvented Prinia	<i>Prinia burnesii</i>	Near Threatened
29	Lammergeier/Himalayan Bearded Vulture	<i>Gypaetus barbatus</i>	Near Threatened

30	Rednecked Falcon	<i>Falco chiquera</i>	Near Threatened
31	Alexandrine Parakeet	<i>Psittacula eupatria</i>	Near Threatened
32	Falcated Teal	<i>Anas falcate</i>	Near Threatened
33	Blacktailed Godwit	<i>Limosa limosa</i>	Near Threatened
34	Eurasian Curlew	<i>Numenius arquata</i>	Near Threatened
35	Indian River Tern	<i>Sterna aurantia</i>	Near Threatened
36	Blackheaded Ibis / Oriental White Ibis	<i>Threskiornis melanocephala</i>	Near Threatened
<b>C. Reptiles</b>			
1	Gharial	<i>Gavialis gangeticus</i>	Critical
2	Green turtle	<i>Chelonia mydas</i>	Endangered
3	Narrow-headed Softshell Turtle	<i>Chitra indica</i>	Endangered
4	Marsh Crocodile	<i>Crocodylus palustris</i>	Vulnerable
5	Olive Ridley Turtle	<i>Lepidochelys olivacea</i>	Vulnerable
6	Common River Turtle/ Crowned River Turtle	<i>Hardella thurjii</i>	Vulnerable
8	Peacock Soft shell Turtle	<i>Nilssononia hurum</i>	Vulnerable
9	Indian Soft-shell Turtle	<i>Nilssononia gangeticus</i>	Vulnerable
10	Black spotted Turtle	<i>Geoclemys hamiltoni</i>	Vulnerable
11	Central Asian Tortoise	<i>Testuda horsfieldi</i>	Vulnerable
12	Brown Roofed Turtle	<i>Pangshura smithi</i>	Near Threatened

### Wildlife Species Protected Under the Sindh Wildlife Protection Act

Sr. No.	Common name	Scientific name
<b>A. Mammals</b>		
1	Pangolin	<i>Manis crassicaudata</i>
2	Ratel	<i>Mellivora capensis</i>
3	Smooth Indian Otter	<i>Lutrogale perspicillata</i>
4	Small Indian Civet	<i>Viverricula indica</i>
5	Caracal	<i>Felis caracal</i>
6	Leopard	<i>Panthera pardus</i>
7	Fishing Cat	<i>Prionailurus viverrinus</i>
8	Indian Wild Ass	<i>Equus hemionus khur</i>
9	Hog Deer	<i>Axis porcinus</i>
10	Chinkara	<i>Gazella bennettii</i>
11	Bluebull	<i>Boselaphus tragocamelus</i>
12	Indus Dolphin	<i>Platanista minor</i>
13	Desert Cat	<i>Felis silvestris</i>
14	Jungle Cat	<i>Felis chaus</i>
15	Sindh Ibex	<i>Capra aegagrus</i>
16	Urial	<i>Ovis vignei blanfordi</i>
<b>B. Birds</b>		
1	Family Ardeidae	All herons, Paddy birds, Egrets or Bitterns
2	Family Pelecanidae	All Pelicans
3	Family Ciconiidae	All Storks
4	Family Threskiornithidae	All Ibises and Spoonbills
5	Family Phoenicopteridae	All Flamingos
6	Family Accipitridae	All Hawks, Vultures, Kites, Buzzards

Sr. No.	Common name	Scientific name
7	Family Falconidae	All Falcons, Kestrels, Hobbies
8	Family Phasianidae	Partridges and Peafowls
9	Family Gruidae	All Cranes
10	Family Otidae	All Bustards
11	Family Strigidae	All Owls
12	Family Tytonidae	All Barn Owls
13	All Geese	All members of the Genus Anser
14	All Swans	All members of the Genus Cygnus
15	Marbled Teal	<i>Marmaronetta angustirostris</i>
16	Spotbill Duck	<i>Anas poecilorhyncha</i>
17	Cotton Teal	<i>Nettapus coromandelianus</i>
18	Whiteheaded Duck	<i>Oxyura leucocephala</i>
19	Woodcock	<i>Scolopax rusticola</i>
20	Large Pintailed Sandgrouse	<i>Pterocles alchata</i>
21	Rosy Pastor	<i>Sturnus roseus</i>
22	Ruddy Shelduck	<i>Tadorna ferruginea</i>
23	Common Shelduck	<i>Tadorna tadorna</i>
24	Houbara Bustard	<i>Chlamydotis undulata/ macqueenii</i>
<b>C. Reptiles</b>		
1	Marsh Crocodile	<i>Crocodylus palustris</i>
2	Python	<i>Python molurus</i>
3	Gavial	<i>Gavialis gangeticus</i>
4	Monitor Lizards	All lizards of Genus Varanus
5	Bengal Monitor	<i>Varanus bengalensis</i>
6	Yellow Monitor	<i>Varanus flavescens</i>
7	Desert Monitor	<i>Varanus griseus</i>
8	Marine Turtles	All Marine Turtles of Genera Dermochelys, Caretta, Eretmochelys, Chelonia and Lepidochelys
9	Loggerhead Sea Turtle	<i>Caretta caretta</i>
10	Green Sea Turtle	<i>Chelonia mydas</i>
11	Hawksbill Turtle	<i>Eretmochelys imbricate</i>
12	Olive Ridley	<i>Lepidochelys olivacea</i>
13	Leatherback Sea Turtle	<i>Dermochelys coriacea</i>
14	Yellow Spotted Mud Turtle/ Spotted Pond Turtle (Freshwater)	<i>Geoclemys hamiltonii</i>
15	Common River Turtle/ Crowned River Turtle (Freshwater)	<i>Hardella thurjii</i>
16	Indian Saw-back Turtle /Indian Roofed Turtle (Freshwater)	<i>Pangshura tecta</i>
17	Brown Roofed Turtle (Freshwater)	<i>Pangshura smithii</i>
18	Indian Flap shell Turtle (Freshwater)	<i>Lissemys punctata</i>
19	Indian Softshell Turtle (Freshwater)	<i>Nilssonina gangeticus</i>
20	Peacock Soft shell (Freshwater)	<i>Nilssonina hurum</i>
21	Narrow-headed Softshell Turtle (Freshwater)	<i>Chitra indica</i>
22	Star Tortoise	<i>Geochelone elegans</i>



## **Annex B – E-Waste Management Procedure**

- Dismantling of any previously installed equipment to follow the proper dismantling procedure available with the facility.
- Collect and store E-waste in the designated storage area.
- Secure dismantling and storage areas with tape or signs allowing everyone to stay away. No unauthorized entry in storage area.
- Daily cleaning and clearing of the dismantling sites are desirable.
- No stacking of dismantled equipment beyond 3 feet height.
- No open dumping or storage of waste. Identify storage area with markings for storing useful and discarded materials separately, within these 2 areas provide space for different types of materials and mark accordingly). Identify equipment that can be repaired/refurbished and reused to extend its useful life thus minimizing the e-waste.
- Provide container/box for collecting and storing different types of wastes. The waste containers should be labeled as a type of waste.
- Develop inventories of dismantled equipment and E-waste generated.
- Under no circumstances shall the workers dispose of any material in environmentally sensitive areas.
- All wastes having economic value produced by SLAST have to be handed over to waste/scrap dealers through auction.
- Create awareness among people engaged in E-waste recycling/ disposal business.
- Develop guidelines and make them part of the contract with scrap purchasers to ensure safe disposal of E-waste.
- Purchaser of scrap (E-waste) to follow specific guidelines on E-waste recycling and disposal.
- The workers involved in the management of E-waste should use proper PPEs and the project team needs to provide them awareness regarding collection and disposal of E-waste.
- Continuous liaison with the Sindh Environmental Protection Agency.
- Follow E-waste National and Provincial legislations.

## Annex C – Chance Find Procedures

Chance Find Procedures Project may involve excavations. Therefore, the possibility of chance find is not ignorable. In case of any chance find, the contractor will immediately report through design & supervision consultant (civil works) to Director General of Antiquities & Archaeology Department, Sindh and respective Project Director of PMU, to take further suitable action to preserve those antique or sensitive remains. Representative of the Director will visit the site and observe the significance of the antique, artefact and Cultural (religious) properties and significance of the project. The report will be prepared by representative and will be given to the Director. The documentation will be completed and if required suitable action will be taken to preserve those antiques and sensitive remains. In case any artefact, antiques and sensitive remains are discovered, chance find procedures should be adopted by contractor workers as follows:

- Stop the construction activities in the areas of chance find.
- After stopping work, the contractor must immediately report the discovery to the Supervision Consultant.
- The Director decides to take over the antiquity for purposes of custody, preservation and protection, the person discovering or finding it shall hand it over to the Director or a person authorized by him in writing.
- Delineate the discovered site or area.
- Consult with the local community and provincial Archaeological Department.
- The Director shall, constitute a team of archaeologists for undertaking preliminary investigation and will decide about further course of action in light of findings of the team.
- The suggestion of the local communities and the concerned authorities will be suitably incorporated during taking the preventive measures to conserve the antique, artefact and cultural (religious) properties; and Secure the site to prevent any damage or loss of removable objects. In case of removable antiquities or sensitive remain, a night guard shall be arranged until the responsible local authorities take over.
- Avoid the use of heavy construction machinery during the excavation process.
- The Contractor staff must have relevant qualification and experience of similar projects.
- Plaster and Painting Works: New Plaster, painting walls and other roof treatment should consider the original color scheme, layout and design to keep the aesthetic and visual impact of the site. Operational Phase: The authority responsible for the O & M of sub project activities will be responsible for housekeeping of the facilities and shall prepare and adopt SOPs for O & M of the subproject facilities. E&S

experts/specialists will ensure that O&M plan is operationalized and will do monitoring visits for compliance of O & M plans.

- **Training and Capacity Building:** The civil work activities shall be carried out by Pre-qualified trained Contractor under supervision of technical staff. The Contractors shall contain team of skilled labors having past experience in similar works. Trainings of the work force should be conducted before start of civil works and during project implementation by the PMU safeguards specialists and Contractor's.
- **Monitoring and Supervision:** Strict Monitoring and supervision as per monitoring plan given in ESMP should be enforced during works.
- **GRM:** The record of any complaints as per GRM mechanism of the project should be implemented.

## Annex D – Environmental and Social Screening Checklists

The Screening checklist is applicable to any civil work activities (new construction, expansion and rehabilitation) under the project. This will include civil works conducted by PGs and PAs under their approved BPs (milk collection centers, livestock sheds, fish ponds, Public fish hatcheries, chilling units etc.)

### A: General Information

1	Project Location (District, Taluka, Deh, Goth)	
2	Category and Name of Livestock / Aquaculture Facility	
	Name of PG/PA (if relevant)	
3	Project Activities	
4	Proposed Date of Commencement of Work	
5	Important geographic / topographic feature (if any)	
6	Important biological feature (if any)	

### B: Environmental Issues

Sr. No	Issues	No/Yes	Risk Level			Remarks/Mitigation Measures
			Low	Moderate	Substantial	
1	Will the subproject involve significant land disturbance or site clearance?					
2	Will the subproject require the setting up of ancillary facilities?					
3	Will the subproject require large amount of raw material or construction materials, energy and/or water?					
4	Will the subproject generate large amounts of residual wastes, construction material waste?					
5	Is the sub-project expected to result in soil erosion?					
6	Is the sub project expected to create borrow pits for construction material?					
7	Will the subproject result in potential soil or water contamination (e.g., from oil, grease and fuel from equipment yards)?					
8	Will the subproject involve the storage, handling or transport of hazardous substances?					
9	Will the sub project disturb the ambient air quality and/or increase the level of harmful air emissions (due to generation of dust from construction and rehabilitation activity, vehicular/ machinery exhaust emissions, etc.)					

Sr. No	Issues	No/Yes	Risk Level			Remarks/Mitigation Measures
			Low	Moderate	Substantial	
10	Will the subproject increase ambient noise levels?					
11	Are there any protected areas on or around the locations which could be affected by the project?					
12	Will there be any adverse impact on the flora and fauna due to project activities?					

**C: Social Issues**

Sr. No	Issues	No/Yes	Risk Level			Remarks/Mitigation Measures
			Low	Moderate	Substantial	
1	Does the subproject involve recruitment of workers including direct, contracted, primary supply, and/or community workers?					
2	Will there be any social conflicts arising from the interaction of laborers with locals, particularly by the induction of outside labor and establishment of construction camps (if any)?					
3	Will the activity engage in exploitative and forced labour?					
4	Will the activity engage in child labour?					
5	Will the activity take place in or near living areas, giving easy access of machines, tools and chemicals to community members including children?					
6	Will the subproject result in an increase in noise levels, vibrations and a decline in ambient air quality due to the operation of construction machinery/vehicles? In particular on the nearby community or sensitive receptors (mosque, temple, church, graveyard, hospital, school/college/university), if any?					
7	Risks related to Occupational Health and Safety (OHS) caused due to construction and rehabilitation activities, generation of waste (hazardous and non-hazardous) and spread of diseases such as waterborne, vector-borne, communicable infections (HIV/STDs), during subproject implementation and operation.					
8	Risks related to community health and safety due to the transport, storage and/or disposal of hazardous, nonhazardous or dangerous materials (such as fuels and other chemicals, construction waste, and health care waste) and spread of diseases during construction, rehabilitation and operation?					
9	Risks of Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) during subproject implementation and operation?					

Sr. No	Issues	No/Yes	Risk Level			Remarks/Mitigation Measures
			Low	Moderate	Substantial	
10	Will the project activity result in adverse impacts on vulnerable groups such as women, children and disabled etc?					
11	Risk of increase in traffic and pedestrian safety due to the construction vehicle movement, particularly near sensitive receptors.					
12	Will anyone be prevented from using economic resources (e.g. pasture, fishing locations, forests) to which they have had regular access?					
13	Any estimate of the likely number of persons that will be affected by the subproject? Are any of them falling into disadvantaged/vulnerable groups?					
14	Have there been any past security related issues at the subproject site?					
15	Has stakeholder engagement taken place with relevant stakeholders (Provincial/District level Government Departments/Communities/NGOs/CSOs) for the proposed subproject?					
16	Is the proposed subproject being implemented in an area with natural hazard risk? (e.g., floods, earthquakes, cyclones etc.).					
17	Will there be any impact on women that may hinder their mobility during reconstruction and rehabilitation activities?					
18	Will the proposed subproject potentially involve shifting of public utilities?					
19	Will the construction and rehabilitation activities cause socio-cultural issues and damage to any cultural heritage site?					
20	Will there be adequate provision of clean water and sanitation services at the facility? Will the facility connect to the municipal wastewater scheme?					

Sindh Environmental Protection Agency (SEPA) NOC / Environmental Approval Required

Type of Environmental and Social Study

Any other NOC from Government of Sindh (GoS)/ Government of Pakistan (GoP) Required

Further assessment required

Type of Environmental and Social Assessment

Conducted by:

Name:\_\_\_\_\_ Designation:\_\_\_\_\_ Signature:\_\_\_\_\_ Date:\_\_\_\_\_

Endorsed by: Producer Group / Producer Alliance (where relevant)

Name:\_\_\_\_\_ Designation:\_\_\_\_\_ Signature:\_\_\_\_\_ Date:\_\_\_\_\_

Reviewed and Approved by:

Name:\_\_\_\_\_ Designation:\_\_\_\_\_ Signature:\_\_\_\_\_ Date:\_\_\_\_\_

**ENVIRONMENTAL AND SOCIAL SCREENING CHECKLIST**

**The Screening checklist is applicable to all Producer Groups/Productive Alliances for Livestock and Aquaculture that will be set up by the project and will apply to the operations of the PGs/PAs throughout project lifetime.**

**A: General Information**

1	PG/PA (District, Taluka, Deh, Goth)	
2	Name of PG/PA	
3	Number of PG Members	Male: Female:
4	PG/PA Activities	
5	Proposed Date of Establishment	
6	Important geographic / topographic feature (if any)	
7	Important biological feature (if any)	

**B: Environmental Issues**

Sr. No	Issues	No/Yes	Risk Level			Remarks/Mitigation Measures
			Low	Moderate	Substantial	
1	Does the PG/PAAactivity fall under the Exclusion List of the project?					
2	Does the activity involve any physical construction and rehabltation works? If yes, please refer to the E&S checklist for civil works/construction					
3	Will the subproject involve significant land disturbance or site					

Sr. No	Issues	No/Yes	Risk Level			Remarks/Mitigation Measures
			Low	Moderate	Substantial	
	clearance?					
4	Will the activity result in overgrazing of rangelands and pastures?					
5	Will livestock feed be sourced or produced in Protected Areas and Notified Forests?					
6	Will the subproject generate large amounts of waste?					
7	Will livestock sheds, fish ponds and collection areas located close to and likely to contaminate water sources?					
8	Will the activity cause air or noise pollution?					
9	Will the activity cause soil erosion?					
10	Will the activity create solid or liquid wastes that would cause potential contamination of water and soil?					
11	Will the activity cause substantial changes to water quality and quantity?					
12	Will the activity cause the alteration of water flow?					
13	Are there environmentally sensitive areas (protect area, forests, national parks or wetlands) which could be affected by the activities ?					
14	Will there be any adverse impact on the flora and fauna due to project activities?					
15	Would the activity cause vegetation and tree removing?					
16	Will the activity be a threat to the endangered and threatened species or cause potential hunting or the collection?					
17	Will the subproject involve the use, storage, handling or transport of hazardous substances?					

**C: Social Issues**

Sr.	Issues	No/Yes	Risk Level	Remarks/Mitigation
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No			Low	Moderate	Substantial	Measures
1	Will the activities result in adverse impacts on vulnerable groups such as women, children and disabled etc.?					
2	Will the PG/PA hire labor from disadvantaged/vulnerable groups (including women, haarees/sharecroppers, traditional fishing communities i.e. Mohana etc.)?					
3	Is there a risk of forced labor/labor exploitation (working without wages, payment of less than minimum wage, excessive working hours, working in dangerous conditions, lack of PPE etc.), especially for labor from disadvantaged/vulnerable groups?					
4	Will the activities carry a risk of child labor?					
5	Will the activities carry a risk of GBV/SEA/SH? Specially for female PGs and PGs hiring female workers.					
6	Will the activity result in production of hazardous liquid and solid waste?					
7	Will the activity take place in or near a site that has historic, or cultural importance for the local community?					
8	Will the activity involve the use of chemicals and tools by the beneficiary and workers?					
9	Will the activities (rearing animals, fish ponds) be close to human settlements and can cause health issues particularly zoonotic diseases?					
10	Will there be application of any pesticides and fertilizers for controlling diseases in animals and fish?					
11	Will the activities include fish ponds near human settlements, resulting in risk of accidents and drownings?					
12	Will the activity create the conflict among the locals? particularly by the induction of outside labor, where required?					
13	Will the activity cause loss of livelihood of nearby Farmers?					
14	Will the activities take place in or near living areas, giving easy access of machines, tools and chemicals to community members including children?					
15	Are there members of community located close to subproject/activity who could benefit from this BP but are being excluded from the PG/PA?					
16	Have there been any past security related issues at the PG site?					
17	Are the proposed activities being implemented in an area with natural hazard risk?					
18	Will there be adequate provision of clean water and sanitation services?					

Sindh Environmental Protection Agency (SEPA) NOC  
 / Environmental Approval Required

Sr. No	Issues	No/Yes	Risk Level			Remarks/Mitigation Measures
			Low	Moderate	Substantial	
	Type of Environmental and Social Study					
	Any other NOC from Government of Sindh (GoS)/ Government of Pakistan (GoP) Required					
	Further assessment required					
	Type of Environmental and Social Assessment					

**Conducted by:**

Name: \_\_\_\_\_ Designation: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Reviewed and Approved by:**

Name: \_\_\_\_\_ Designation: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**E&S Screening Checklist for Vehicles (Mobile Clinic/Labs)**

Sr. No.	E&S Risks & Issues	Yes	No	Remarks/Mitigation Measures
1	Will the vehicle be environmentally friendly and operates with high fuel efficiency and reduced emissions?			
2	Will non-slippery flooring surfaces /materials inside the vehicle be available?			
3	Will there be provision for electrical safety measures in the vehicle?			
4	Will there be provision for Noise Abatement in the vehicle?			
5	Will there be provision for fire extinguisher in the vehicle?			
6	Will there be provision of safety features (mirror hammer, power-assisted steering system, efficient braking system, fog lamps, tool kit, airbags, seat belts, backup cameras, metallic safeguard on front and back bumpers, front and reverse horn and indication stickers/ tapes) in the vehicle?			
7	Will there be provision for healthcare waste storage in the vehicle?			
8	Will First Aid Kit be available in designed vehicle?			

<b>Sr. No.</b>	<b>E&amp;S Risks &amp; Issues</b>	<b>Yes</b>	<b>No</b>	<b>Remarks/Mitigation Measures</b>
9	Will there be provision of ample storage space for medical equipment and supplies in the vehicle?			
10	Will there be provision of disinfection system in the vehicle?			
11	Will there be provision of fridge for storing medicines/samples in designed vehicle?			
12	Will there be any manufacturer instructions and applicable regulations for the vehicle?			
13	Will the vehicle have a valid guarantee/warranty from the manufacturer?			
14	Will the vehicle be equipped with 4x4 gear option?			
15	Will the procurement of these vehicles result in the disposal/ scraping of existing vehicles?			
16	Will the procurement of vehicle create any parking space issue in the health facility?			
17	Will the proper washing and cleaning arrangements available for the vehicle in the facility?			
18	Will the proper arrangement available in the facility to dispose health care waste from the vehicle?			
19	Will the sufficient trained drivers (with valid license) available to drive the vehicles?			
20	Are there sufficient control measures for combating the spread of communicable diseases and risk of infections from animals?			
21	Will there be protective clothing (such as facemasks preferably particulate respirators with face shields, gloves, sanitizers and a lab coat) when handling animal?			
22	Will it be ensured that no worker is engaged as staff in mobile unit, with severe or life-threatening allergic reactions to animals?			
23	Will the working compartment of the mobile unit be sufficiently ventilated?			
24	Will there be training programs to educate workers about animal allergies and steps for risk reduction?			

Conducted by:

Name: \_\_\_\_\_ Designation: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed and Approved by:

Name: \_\_\_\_\_ Designation: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## **Annex E – Template of ESMP**

The Project will engage the consultants to prepare the Environmental and Social Management Plans (ESMPs) identified under Environmental and Social Management Framework (ESMF) of SLAST, in order to ensure that the activities carried out under the proposed Project are (i) environmentally sound and sustainable in the long run; and (ii) consistent with the environmental safeguard guidelines, rules and regulations of the Government of Pakistan (only those which are applicable) and , as well as those of the World Bank’s Environmental and Social Framework (ESF).

### **Proposed ESMP Structure**

The content of the ESMP will include, but not limited to the following:

- Abbreviations And Glossary
- Executive Summary: Concisely discusses significant findings and recommended actions including summary Table of ESMP.
- Introduction, including background, objective of ESMP, Approach and Methodology, Project Area; Study Team
- Legal and policy framework, GoP/ Sindh requirements (legislation; guidelines and rules; policies; international treaties signed by Pakistan; national and provincial authorities; environmental procedures), their applicability, and compliance status for the Project. World Bank requirements (ESF and ESS; and WBG Environmental Health and Safety guidelines) and their triggering and compliance status for the Project.
- Description of the proposed subprojects, including need of the project, layout and location, salient features, resource requirements, wastes to be generated, manpower requirement, a brief description of construction activities, and a brief description of operation and maintenance activities.
- Baseline description, primarily describing the proposed site and its immediate surrounding aided with maps, photographs and schematics, key environmental and social aspects/resources of the surroundings such as land form and land use, water resources, settlements, any critical habitat or protected area, any cultural heritage sites or graveyards, any sensitive receptor such as schools and hospitals, access routes, and other relevant details.
- Stakeholder consultations, recording the key concerns and suggestions of the community regarding the proposed subprojects and its potential impacts, and a description of the way these concerns will be addressed.
- Impact assessment: methods and techniques for analyzing the anticipated environmental and social impacts.
- Discussion of the potentially adverse environmental and social impacts of the proposed sub-project along with their significance.

- Mitigation plans, listing all the impacts, their mitigation measures, assigning responsibility of implementing these measures, and also assigning responsibility for monitoring. Also identifying cumulative impacts if applicable.
- Institutional Arrangement including roles and responsibilities and capacity available
- Monitoring plan, describing the monitoring requirements, frequency, and responsibility of conducting the monitoring.
- Capacity development and training plan, describing the training requirements, contents, frequency, training recipients, and responsibility of conducting the desired trainings.
- Documentation and reporting, describing the requirement, frequency, and responsibility of documentation and reporting.
- Grievances redress mechanism (GRM), a mechanism to define roles and responsibilities of the persons responsible to address the grievances of the affectees.
- ESMP implementation budget, providing the cost estimate of its implementation.
- Supporting Annexures

## Annex F – Environmental and Social Monitoring Checklist for Producer Groups/Productive Alliances

*This checklist will be filled by the PCMU and Sub-PMU monitoring teams for all PGs and PAs operations throughout the project lifetime.*

Category of PG/PA (Livestock or Aquaculture): \_\_\_\_\_

Activities Inspected \_\_\_\_\_

Name of PG/PA: \_\_\_\_\_

Weather Condition \_\_\_\_\_

Location (District, Taluka and Village) \_\_\_\_\_

Date: \_\_\_\_\_

Number of PG/PA Members: Male \_\_\_\_\_ Female \_\_\_\_\_

Time: \_\_\_\_\_

Sr. No	Performance Indicators	Yes	No	N/A	Description	Remarks
1.	Dust and gaseous Emissions					
2.	Noise or vibration					
3.	Water sprinkling at the construction or rehabilitation site and disposal sites					
4.	Fence installed around the construction and rehabilitation site					
5.	Discharge of wastewater to nearby water course/water body					
6.	Is construction and rehabilitation waste being stored onsite temporarily within a designated area and properly disposed?					
7.	Is waste generated from livestock and aquaculture activities properly managed and disposed?					
8.	Lead/acid/cadmium-based batteries for solarization					
9.	Any spillage of fuel/oil and lubricant observed					
10.	Use of hazardous chemicals					
11.	Any Disease outbreak					
12.	Planting of exotic plant species					
13.	Protection of Flora/Fauna					
14.	Hunting, Poaching and Accidental Mortalities of Wildlife					
15.	Use of Lethal Drugs and Pesticides Resulting in Mortality of Wildlife					
16.	Introduction of Alien Invasive Fish Species					

Sr. No	Performance Indicators	Yes	No	N/A	Description	Remarks
17.	Source of water for fish ponds?					
18.	Availability of Drinking water					
19.	Site housekeeping					
20.	Warning signs displayed at site					
21.	Use of PPEs by the beneficiaries and workers					
22.	Are fire extinguishers available and properly maintained					
23.	Security arrangements at site					
24.	Community and Occupational health and safety issues					
25.	Any incident/accident (use separate proforma)					
26.	Any GBV/SEA/SH and privacy related complaints					
27.	Availability of first aid boxes at site					
28.	Any involuntary resettlement under the project					
29.	Proportion of local labor in the project					
30.	Labor from outside the community					
31.	Use of Child Labor					
32.	Use of Forced Labor (eg. labor is not being paid wages)					
33.	Is the labor being paid minimum wage or above?					
34.	Are the labor working hours in compliance with the provincial laws?					
35.	Is the GRM properly in place (including signage)					
36.	Regular monitoring of complaint register is in practice					
37.	Any exclusion, specially to women, disadvantaged groups and marginalized people from project forums					
38.	Any elite capture related grievance					
39.	Participation of women, vulnerable groups and historically underserved communities					
40.	Any Unusual Conditions (e.g., heavy rain, extreme weather)					
41.	Chance finding of chance finding physical cultural resources					
42.	Are food safety measures in place (clean storage of dairy products and fish, temperature control, use of gloves and masks, use of clean containers, proper packaging etc.)?					
43.	Awareness of GRM and its purpose					



Sr. No	Performance Indicators	Yes	No	N/A	Description	Remarks
44.	Awareness regarding communicable and other infectious diseases					
45.	Awareness and training regarding application of pesticides, fertilizers and vaccination					
46.	Awareness and training regarding E&S Management?					
47.	Awareness and training regarding wildlife conservation and protection					
48.	Unanticipated impact, if any					
<b>Note If any:</b>						
<b>Details of PG/PA Members who were met:</b>						
	<b>Name</b>	<b>Designation</b>	<b>Signature</b>			
1.						
2.						
3.						
4.						
5.						
<b>Filled By:</b>		<b>Extra Note if needed:</b>				
_____						
<b>Signature</b>						
<b>Name:</b> _____						
<b>Position:</b> _____						
<b>Date:</b> _____						