PROJECT IMPLEMENTATION UNIT
PIU (IFRAP)

INTEGRATED FLOOD RESILIENCE AND ADAPTATION PROJECT (IFRAP- COMPONENT - I)

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

PACKAGE-IV

RESTORATION/STRENGTHENING OF FLOOD EMBANKMENT OF MAIN RABI CANAL FROM RD 0+000 TO 25+000, DISTRICT NASEERABAD

MAY 2026

CAMEOS CONSULTANTS

ISLAMABAD OFFICE: PLOT NO. 07, 1ST FLOOR, PARIS ARCADE, E-11/3, MPCHS, ISLAMABAD, PAKISTAN
TEL: 051-2222104 & 05
EMAIL: cameos@consultant.com

PESHAWAR OFFICE: HOUSE NO. 35-E, CANAL ROAD, UNIVERSITY TOWN, PESHAWAR, KHYBER PAKHTUNKHAWA, PAKISTAN

QUETTA OFFICE: 38-A, CHAMAN HOUSING SCHEME, AIRPORT ROAD, QUETTA
TEL: 081-2864216 FAX: 051-2222105

LAHORE OFFICE: HOUSE NO.62, SECTOR C-2, COLLEGE ROAD, TOWNSHIP LAHORE.

www.cameosconsultants.com

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ABBREVIATIONS AND ACRONYMS

BEPA	Balochistan Environmental Protection Agency
BIWRMDP	Balochistan Integrated Water Resource Management and Development
BLEP	Balochistan Livelihood and Entrepreneurship Project
BOQs	Bill of Quantities
CSC	Construction Supervision Consultant
CWD	Communication and Works Department
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
ESIA	Environmental and Social Impact Assessment
ESHS	Environmental, Social, Health and Safety
ESMF	Environmental and Social Management Framework
WB-ESSs	World Bank Environmental and Social Standards
FPMU	Federal Project Management Unit
GBV	Gender Base Violence
GDP	Gross Domestic Product
GIS	Geographic Information System
GoB	Government of Balochistan
GRM	Grievance Redressal Mechanism
ICT	Information and Communication Technology
IEE	Initial Environmental Examination
IFRAP	Integrated Flood Resilience and Adaptation Project
IUCN	International Union for Conservation of Nature
LMP	Labor Management Plan
MGD	Millennium Development Goal
MIS	Management Information System
MoPDSI	Ministry of Planning, Development and Special Initiatives
NOC	No Objection Certificate
NSER	National Socio-Economic Registry
OHS	Occupational Health and Safety
PCC	Public Complaints Centre
PDNA	Post-Disaster Needs Assessment
PDO	Project Development Objective
PIS	Project Implementation Strategy
PIU	Project Implementation Unit
PMD	Pakistan Meteorological Department
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SEP	Stakeholder Engagement Plan
STAT	Social Technical Assistance Team
SWMPs	Solid Waste Management Plans
VRCs	Village Reconstruction Committees
WB	World Bank
SEP	Stakeholder Engagement Plan
FPMU	Field Project Management Unit
PSIA	Poverty and Social Impact Analysis
CFP	Community Feedback Process

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

1. PROJECT BACKGROUND

Balochistan, the largest province of Pakistan, remains one of the most water-stressed and climate-vulnerable regions of the country. Its fragile irrigation infrastructure, arid climate, and dispersed rural settlements make it highly susceptible to both droughts and floods. The catastrophic monsoon floods of 2022 caused extensive damage to dams, irrigation systems, and flood protection infrastructure, disrupting livelihoods, destroying crops, and endangering rural communities.

In response, the Government of Pakistan, with financial assistance from the World Bank, launched the Integrated Flood Resilience and Adaptation Project (IFRAP) under the broader *Post-Flood 2022 Reconstruction Programme: Resilience Enhancement and Livelihood Diversification in Balochistan*. IFRAP aims to restore and strengthen the province's water and flood management systems, enhance agricultural productivity, and integrate climate resilience into infrastructure planning and implementation.

Initially, 55 sub-projects were included in the PC-I under the Integrated Flood Resilience & Adaptation Project (IFRAP). During initial surveys twenty (20) sub-projects couldn't meet the World Bank's selection criteria given in Project Appraisal Document (PAD), hence, dropped, whereas the remaining thirty five (35) sub-projects were shortlisted for detailed design.

These Thirty five (35) shortlisted sub-projects as shown in Figure -1-1 below are located in 19 Districts of Balochistan, including Districts Awaran, Lasbela, Hub, Naseerabad, Jaffarabad, Sohbat Pur, Jhal Magsi, Harnai, Musakhel, Sibi, Kachhi, Killa Saifullah, Pishin, Ziarat, Kalat, Mastung, Kharan, Nushki, and Washuk. The portfolio consists of 11 dams /storage structures, 11 Perennial/ Flood Irrigation schemes, and 13 flood protection structures, which have been grouped in thirteen Packages. The Rabi Canal Flood Embankment in District Naseerabad is one of the sub-projects being implemented under Package-IV of IFRAP to protect local settlements and agricultural lands from recurrent flood events.

The Rabi Canal Flood Embankment lies near villages Goth Haji Noor Muhammad Chakrani, Goth Haji Imdad Hussain Qadir, Goth Fazal Muhammad Jamali , Shori Data and Goth Qaiser Khan at coordinates 28°38'44.42"N ,68°24'19. 78"E. The Rabi Canal Flood Protection Structure is proposed to rehabilitate and strengthen the upstream 25 km reach (RD 0+000 to RD 25+000) of the canal in District Naseerabad, which has experienced overtopping, embankment erosion, and localized breaches during recent flood events. The canal has suffered from heavy siltation, bed aggradation, and distorted cross-sections, reducing its hydraulic capacity and water delivery efficiency. The proposed works include complete desilting, re-sectioning of the canal prism, and restoration of the regime bed slope to improve hydraulic performance and ensure reliable discharge conveyance. Additionally, the right-bank berm will be raised and strengthened as a flood protection embankment to prevent future breaches and provide lateral flood containment. Existing five super passages will continue to facilitate drainage flow across the canal, while eight proposed 0.60 m diameter pipe inlets will safely convey surface runoff and reduce pressure on the canal embankments. These interventions aim to restore hydraulic stability, enhance flood resilience, and ensure sustainable irrigation supply to the command areas. The sub-project will rehabilitate and strengthen the existing damaged structure with improved design standards and materials to withstand future hydrological extremes.
The project aims to:

- Protect agricultural lands and human settlements from future flood risks.
- Enhance climate resilience through strengthened flood protection infrastructure.

- Promote sustainable land use and agricultural productivity; and
- Support socio-economic recovery of flood-affected communities in Naseerabad District.

The proposed works will be confined to previously disturbed areas and do not intersect with any protected areas, wetlands, or ecologically sensitive zones.

2. OBJECTIVES OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

The Environmental and Social Management Plan (ESMP) has been prepared in line with the World Bank Environmental and Social Framework (ESF), the Environmental and Social Commitment Plan (ESCP), and relevant national and provincial environmental legislation. The ESMP provides a practical framework for identifying, mitigating, and monitoring potential environmental and social risks during project planning, construction, and operation. Its primary objectives are to:

1. Ensure that environmental and social impacts are effectively managed and mitigated;
2. Promote compliance with World Bank Environmental & Social Standards (ESS 1–10).
3. Enhance occupational health, safety, and welfare of workers and nearby communities.
4. Maintain stakeholder participation and transparency through effective consultation and grievance mechanisms; and
5. Ensure long-term sustainability, climate resilience, and community safety of the flood protection infrastructure.

The ESMP will form part of the tender and contract documents to ensure that the Construction Contractor (CC) and Construction Supervision Consultant (CSC) fully integrate environmental and social compliance requirements into their respective roles.

3. LEGAL AND POLICY FRAMEWORK

The ESMP is guided by the following frameworks and instruments:

- World Bank Environmental and Social Standards (ESS 1–10), covering risk management, labor and working conditions, pollution prevention, community health and safety, biodiversity, and stakeholder engagement.
- IFC and World Bank Group Occupational Health and Safety Guidelines.
- Pakistan Environmental Protection Act, 1997, and Balochistan Environmental Protection Act, 2012.
- National Environmental Policy, 2005, National Conservation Strategy, Pakistan Climate Change Act, 2017, and National Disaster Management Act, 2010; and
- Relevant international conventions on biodiversity, climate change, labor standards, and cultural heritage to which Pakistan is a signatory.

4. ENVIRONMENTAL AND SOCIAL BASELINE

The Rabi Canal Flood Embankment site lies within the Kachi River Basin, characterized by semi-arid climate, The terrain is mostly flat, making it suitable for agriculture. Summers in the district are typically long, dry, and intensely hot, with temperatures frequently rising up to 45°C during the peak season. The district experiences a short monsoon season, with limited rainfall occurring mainly between July and September, contributing to the region's overall aridity. While the rains provide some relief, they are often insufficient to impact the overall dryness of the region significantly. Winters in Naseerabad are mild but still dry. Daytime temperatures during the winter

months range from 15°C to 25°C, offering a much-needed respite from the scorching summer heat. The geological formation mainly comprises alluvial and gravelly silt deposits. Groundwater is limited and variable in quality. The area supports subsistence agriculture and livestock-based livelihoods. There are no protected ecological habitats, forests, or significant cultural heritage sites within or near the project footprint.

Socio-economically, local communities are small, rural, and economically vulnerable. The project's implementation will provide short-term employment opportunities, improved flood protection, and enhanced livelihood security for local residents.

5. IMPACT ASSESSMENT AND MITIGATION

Potential environmental and social impacts were identified for both construction and operation phases. These include:

- Temporary dust, noise, and air emissions from machinery.
- Disposal of construction waste and spoil.
- Occupational and community health and safety risks; and
- Temporary traffic disruptions during material transport.

No permanent displacement or land acquisition is required.

Mitigation measures include:

- Implementation of Contractor's ESMP (CESMP) including site-specific management plans for waste, traffic, health and safety, and emergency response.
- Provision of Personal Protective Equipment (PPEs), first aid, and safety training.
- Controlled disposal of waste through licensed entities at designated locations.
- Restoration of disturbed surfaces post-construction.
- Continuous environmental and social monitoring and reporting; and
- Active stakeholder engagement and a functional Grievance Redress Mechanism (GRM) for workers and communities.

5.1 CUMULATIVE IMPACTS:

In line with the World Bank's ESS1 requirements, the potential for cumulative environmental and social impacts was assessed. The review confirmed that no significant concurrent or planned projects exist within the sub-project's area of influence that could interact with the proposed interventions. As the sub-project primarily involves rehabilitation of an existing flood protection embankment, the anticipated impacts are localized, temporary, and manageable through the prescribed mitigation measures. Overall, no adverse cumulative impacts are expected; rather, the sub-project will contribute positively by enhancing flood resilience, safeguarding agricultural lands and local communities, and reducing the risk of future flood-related damages.

6. INSTITUTIONAL ARRANGEMENTS

Environmental and social management will be coordinated through the Project Implementation Unit (PIU) under the Irrigation Department, Government of Balochistan, with oversight by the World Bank. The Construction Contractor will implement the ESMP on-site, under supervision of the Construction Supervision Consultants (CSC) and periodic audits by the PIU.

Capacity building, training, and awareness programs will be conducted for project staff to ensure effective ESMP implementation. A dedicated Environmental and Social Specialist Team has been mobilized to oversee compliance and reporting.

7. GRIEVANCE REDRESS MECHANISM (GRM)

A transparent and accessible Grievance Redress Mechanism will be operational throughout the project lifecycle to address concerns of both workers and community members. The GRM includes a Public Complaint Cell, Grievance Redress Committee (GRC) at site and PIU level, and clear timelines for acknowledgment, investigation, and resolution of complaints.

8. ENVIRONMENTAL AND SOCIAL MANAGEMENT BUDGET

The ESMP includes an allocated environmental and social management budget, covering mitigation, monitoring, capacity building, awareness programs, and contingency measures. The cost will be integrated into the overall project budget to ensure sustainable and compliant implementation.

9. CONCLUSION

The Rabi Canal Flood Embankment represents a critical intervention for enhancing flood resilience and protecting vulnerable communities in Naseerabad District. Implementation of this ESMP will ensure that environmental, social, and occupational risks are minimized and that construction and operation are conducted in a safe, sustainable, and socially inclusive manner. By integrating environmental safeguards, stakeholder engagement, and climate-resilient design, the project will contribute substantially to disaster risk reduction, livelihood restoration, and the broader resilience-building objectives of the Integrated Flood Resilience and Adaptation Project (IFRAP) in Balochistan.

1

INTRODUCTION

1 INTRODUCTION

1.1 PROJECT BACKGROUND

Balochistan, Pakistan's largest but driest province, has historically grappled with acute water scarcity, fragile irrigation networks, and inadequate flood protection systems. Its arid climate, rugged terrain, and dispersed rural settlements create inherent vulnerabilities in water management. The catastrophic monsoon floods of 2022 further exposed these weaknesses. Intense rainfall, combined with rapid runoff from steep hill catchments, overwhelmed natural drainage systems and caused widespread destruction of hydraulic infrastructure across the province.

The floods severely damaged dams, perennial and flood irrigation schemes, and flood protection structures. Irrigation supplies were disrupted, agricultural lands and crops were destroyed, and rural communities already living with limited resources were exposed to unprecedented flood risks. These impacts were compounded by systemic issues: aging and poorly maintained structures, outdated design standards, lack of flood protection coverage, weak institutional capacity, and insufficient weather monitoring, forecasting, and disaster preparedness. Collectively, these factors intensified both the scale of damages and the long-term vulnerability of communities.

Recognizing the urgent need for resilience, the Government of Pakistan, with financial support from the World Bank, initiated the Integrated Flood Resilience and Adaptation Project (IFRAP) under the broader Post-Flood 2022 Reconstruction Programme: Resilience Enhancement and Livelihood Diversification in Balochistan. IFRAP aims to rehabilitate and strengthen irrigation and flood management systems across the province, restoring agricultural productivity, protecting rural livelihoods, and embedding climate resilience into future infrastructure.

Initially, 55 sub-projects were included in the PC-I under the Integrated Flood Resilience & Adaptation Project (IFRAP). During initial surveys twenty (20) sub-projects couldn't meet the World Bank's selection criteria given in Project Appraisal Document (PAD), hence, dropped, whereas the remaining thirty five (35) sub-projects were shortlisted for detailed design.

These Thirty five (35) shortlisted sub-projects as shown in Figure -1-1 below are located in 19 Districts of Balochistan, including Districts Awaran, Lasbela, Hub, Naseerabad, Jaffarabad, Sohbat Pur, Jhal Magsi, Harnai, Musakhel, Sibi, Kachhi, Killa Saifullah, Pishin, Ziarat, Kalat, Mastung, Kharan, Nushki, and Washuk. The portfolio consists of 11 dams /storage structures, 11 Perennial/ Flood Irrigation schemes, and 13 flood protection structures, which have been grouped in thirteen Packages.

1.2 PROJECT OBJECTIVES

The overall objectives of the "Post-flood 2022 Reconstruction Programme: Resilience Enhancement and Livelihood Diversification in Balochistan" is to support, finance and incentivize post-flood reconstruction, resilience enhancement and livelihood diversification initiatives of the Federal and Balochistan government with a primary and upfront focus on flood-ravaged and resource-constrained province of the country. The main objectives of the IFRAP (Irrigation Component) of the Programme are as under:

i. Urgent rehabilitation of the Irrigation System for restoring irrigation water supplies to irrigate the command areas and to achieve desired production in the affected areas for reviving the livelihoods of the population.
ii. Reconstruction/rehabilitation of FIS/PIS and irrigation infrastructure to ensure regular and sustainable water supplies to crops to safeguard food security and livelihood of the concerned population.

iii. Reconstruction, rehabilitation and improvement of flood protection facilities for preventing future flood damages to private and public infrastructure, besides, losses to human lives.

iv. Rehabilitation of the storages structures/dams and strengthening/remodeling of their allied components, especially Spillways to ensure sustained water availability for the command area.

v. To restore the productivity of the irrigation system back to the desired levels.

1.3 PROJECT SCOPE

Overall, thirty-five (35) Sub-projects have been picked up under the World Bank funded IFRAP for reconstruction/rehabilitation, which are located in 19 Districts of Balochistan Province. Details of sub-projects are mentioned in Section 1.1 above. A map showing the location of sub-projects is given in the following Figure-1.1.

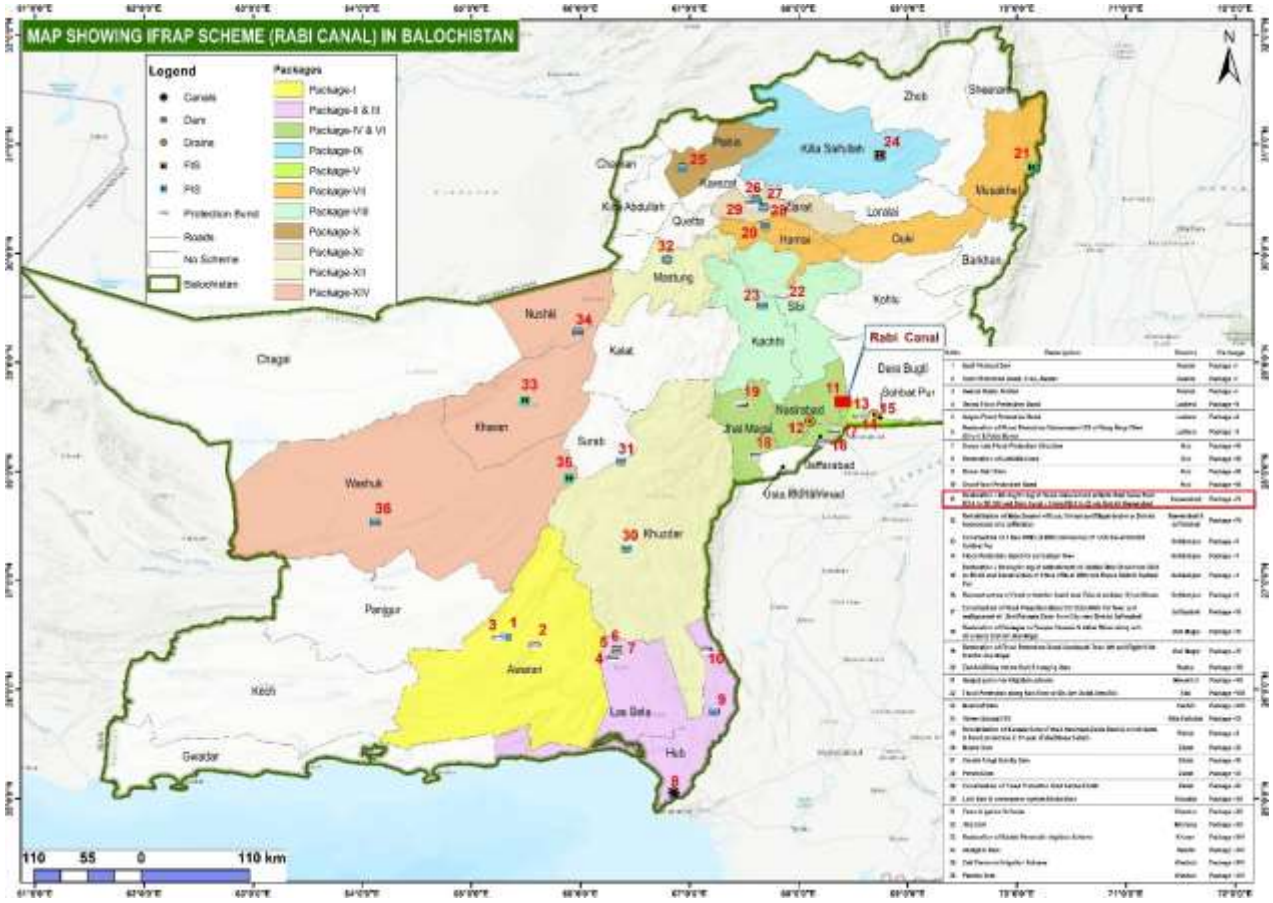

Figure -1: Location map showing the sites of sub-projects

1.4 OBJECTIVES OF ENVIRONNEMENTAL & SOCIAL MANAGEMENT PLAN (ESMP)

The Environmental and Social Management Plan (ESMP) has been prepared in compliance with Bank's Environmental and Social Framework (ESF) requirements including E&S Standards (ESS). ESMP provides a framework for implementing and managing the mitigation and monitoring measures recommended against the project activities. ESMP identifies environmental and social management measures to be implemented throughout the project. The purpose of the ESMP is to consider and develop adequate measures and controls to minimize and mitigate the potential environment and social risks to manage adverse impacts identified during the project implementation. The main objective of the ESMP is to ensure that anticipated environmental and social impacts and risks are effectively managed during the construction, operation, and closure

of the project. The ESMP specifies the mitigation measures which are to be implemented by the contractor.

This ESMP would be included in the tender/contract as an integral part of the bid document. The specific sections of ESMP such as introduction to IFRAP; regulatory and policy reviews; institutional and implementation arrangements; grievance redress mechanism; and, contractor requirements i.e. staffing, Contractors Environment and Social Management Plan (CESMP) and Health & Safety Plan (HSP) as part of this document. Data and information pertaining to the engineering activities have been provided in specific sections of this ESMP, i.e., engineering activities; environmental and social baselines (ambient air/noise/water quality), impact and mitigation, community and stakeholder consultation, and implementation budget. The ESMP has been completed in accordance with provincial and national legislation, and the World Bank's Operational Policies (OPs). Stepwise objectives, which can be contractual obligations of contractor are as under:

Familiarity with World Bank Safeguard Policies: This is a donor funded project, contractor must be familiar with the World Bank Environmental and Social Commitment Plan (ESCP) and other safeguards policies, guidelines, and standards.

Site selection for Facilities: To ensure the environmental performance, site selection for different project facilities e.g., campsites, batching and/or crushing plant, workshop and or machine yard need to be carefully selected as per the guidelines. All the activities within these facilities along with construction work on site also need to be in line with the requirements.

Human Resource: ESMP identifies the human resource required for environmental compliance, better reporting and enhanced environmental performance. Mitigation Measures: Mitigation measures identified against each activity will maximize potential project benefits and control negative impacts.

Climate Resilient infrastructure: ESMP emphasizes to combine grey and green infrastructure. Contractor needs to integrate Environmental measures during the construction process for a sustainable, resilient, and socially inclusive execution.

Defining roles and responsibilities of Project Actors: ESMP also defines liabilities of project actors like CC, Construction Supervision Consultant (CSC).

Environmental Trainings: Need and frequency of Environmental trainings to the contractor and other project staff is also comprehended and included in the plan.

Environmental Budgeting: ESMP also calculates overall budget estimate along with its breakup for sustainable execution.

Documentation requirements: This also explains the requirements for communication and reporting during the project life.

Inspection and Supervision: This document also mentions inspection and monitoring frequency by CC, CSC, implementing body and donor agency to make sure compliance to ESMP document.

Contractor ESMP: The contractor will be required to prepare CESMP inclusive:

- Campsite management plan
- Waste Management Plan
- Occupational Health & Safety Plan

- Emergency Response Plan
- Traffic Safety and Diversion Management Plan
- Solid & Liquid Waste Management Plan
- Air Quality, Noise & Dust Management Plan
- Biodiversity Management Plan (Flora & Fauna)

1.5 APPROACH AND METHODOLOGY

Table 1-1: Methodology for ESMP Preparation

Sr. No.	Component	Description
1	Data Collection & Literature Review	Sub-project documents including ESMF of the project and other published and unpublished information/data was gathered.
2	Review of Legal and Institutional Framework	Reviewed all applicable national environmental and social regulations, including World Bank (WB) Environmental and Social Framework (ESF), IFC Performance Standards and assessed institutional capacity, roles and responsibilities at all stages of the project.
3	Baseline Environmental & Social Survey	Carried out environmental and social baseline studies. For example, ambient air, water (surface, ground), soil, noise, socio-economic and ecological environment etc.), identified sensitive receptors and consulted with the local communities.
4	Impact Assessment & Analysis	Determined likely impacts, both positive and negative during implementation and operation and classified impacts as direct, indirect, long-term, short-term and cumulative.
5	Mitigation and Enhancement Measures/Options	Planed the mitigation options like pollution reduction, biodiversity management, waste management, occupational and community health & safety plan and other mandatory options for continual environmental and social improvement and applied the mitigation hierarchy at different stages of the project. Further, also included enhancement strategies for positive E&S impacts.
6	Stakeholder Consultation & Disclosure	Carried out the initial participatory meetings with affected communities and other stakeholders and integration of feedback into final ESMP will continue during the project, as ESMP being the standalone and living document.
7	ESMP Document	Tabulated the mitigation measures in detail and monitoring plan has been formulated, including the methodology, frequency and responsibilities. Training needs and capacity building and stakeholder engagement and grievance mechanism has been incorporated. Furthermore, budget and resource allocation for E&S monitoring has been made part of the plan.

1.6 SUB-PROJECT AREA

The sub-project irrigation scheme Rabi Canal Embankment is located in district Naseerabad, located 28°38'44.42"N ,68°24'19.78"E. Nearby villages are Goth Haji Noor Muhammad Chakrani, Goth Haji Imdad Hussain Qadir, Goth Fazal Muhammad Jamali, Shori Data, Goth Mola Bukhsh, Goth Qaiser Khan and Goth Muheem Khan Khotani. The proposed scheme of Rabi Canal Embankment, is homogenous compacted earth fill Bund, with a proposed length of 25000 meters.

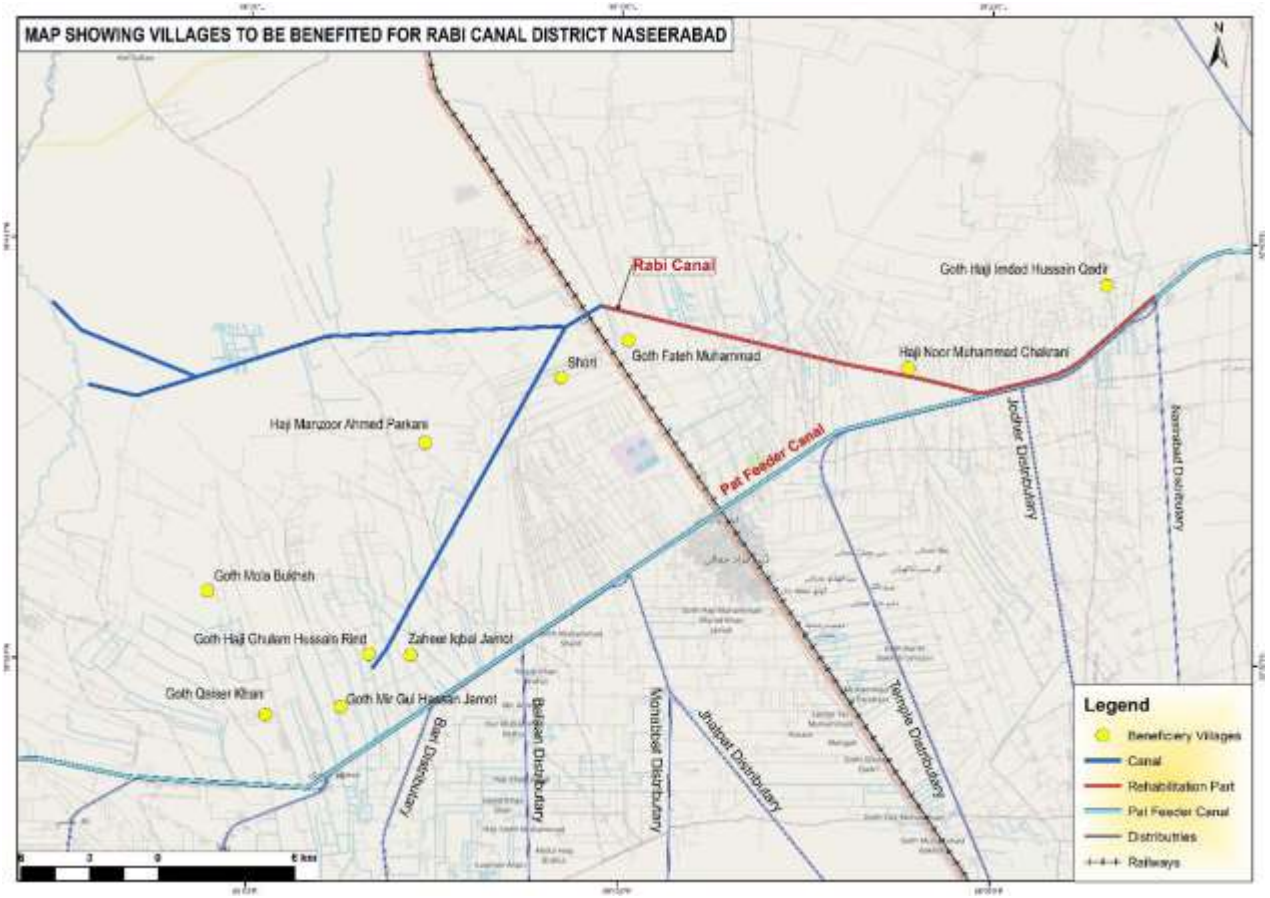

Figure-1: Map showing proximity to the project site Table 1-2: Distance of nearby villages from the Main

Village Name	Distance from the Subproject Area
Goth Haji Noor Muhammad Chakrani	0.30 km
Goth Haji Imdad Hussain Qadir	1.75 km
Goth Fateh Muhammad Jamali	1.2 km
Goth Manzoor Ahmed Parkani	2.77 km
Shori	2 km
Goth Mir Gul Hassan Jamot	5.66 km
Goth Mola Bukhsh	10.30 km
Zaheer Iqbal Jamot	2 km
Goth Qaiser Khan	6 km
Goth Haji Ghulam Hussain Rind	0.5 km
Goth Muheem Khan Khotani	1.6 km

1.2.1 The HHs and Population: nearby villages from the Main Drains

Canals	Village(s)	Households	Population
Rabi canal 1	Killi Hasan Abad 1	600	4,800
Rabi canal 2	Killi Hasan Abad 2	700	5,600
	Kashak Abad	300	2,100
Total		1,600	12,500

The sub-projects are intended exclusively for flood protection purposes, focusing on the rehabilitation and strengthening of the existing damaged embankment to ensure effective flood management and safeguard adjoining areas from potential inundation. The proposed interventions will help protect agricultural lands and nearby settlements, promote sustainable land use, and significantly enhance the socio-economic resilience and safety of local

communities. He proposed Subproject does not lie at or near by any protected area, conservation area, wetlands, buffer zone and vulnerable area. The damage is shown clearly in the site images figure 1.2.

Figure-2: Photographs of damaged Rabi Canal Flood Protection Embankment

1.7 PROPOSED ACTIVITIES

The proposed intervention focuses on the rehabilitation and remodeling of the Main Rabi Canal under Package-IV to restore its hydraulic efficiency and improve overall conveyance performance. The primary objective of the scheme is to ensure reliable irrigation supply, enhance flood resilience, and protect adjacent agricultural lands and settlements from overtopping and breach risks.

The proposed works cover a 25 km reach of the Rabi Canal (RD 0+000 to RD 25+000), where the canal has experienced significant siltation, bed aggradation, and distortion of cross-sections, resulting in reduced discharge capacity and inefficient flow conditions. The scope of works

includes desilting, re-sectioning of the canal prism, and restoration of the design bed slope to achieve uniform and efficient hydraulic performance.

The canal will be reshaped to restore its standard trapezoidal section, ensuring adequate flow depth and stable side slopes (2H:1V) in accordance with design requirements. The rehabilitation works also include raising and strengthening of the right bank berm to function as a flood protection bund, addressing past breach incidents and providing protection against high flood levels.

Construction activities will involve site clearance, removal of accumulated sediments, excavation and reshaping of the canal section, bed slope correction, and formation of stable side slopes and berms. Suitable earth material will be utilized for embankment strengthening, with proper compaction to ensure structural stability and durability.

In addition, existing cross-drainage and utility structures, including pipe inlets and super passages, will be repaired or upgraded where required to maintain hydraulic continuity and prevent localized flow obstruction. Provision of pipe inlets at vulnerable locations will facilitate controlled inflow of surface runoff, thereby reducing hydrostatic pressure on canal embankments and minimizing the risk of future breaches.

These interventions are designed to ensure hydraulic stability, improved conveyance efficiency, and enhanced flood protection, thereby increasing the resilience and operational reliability of the Rabi Canal system. The detailed construction activities are presented in Table 1-3.

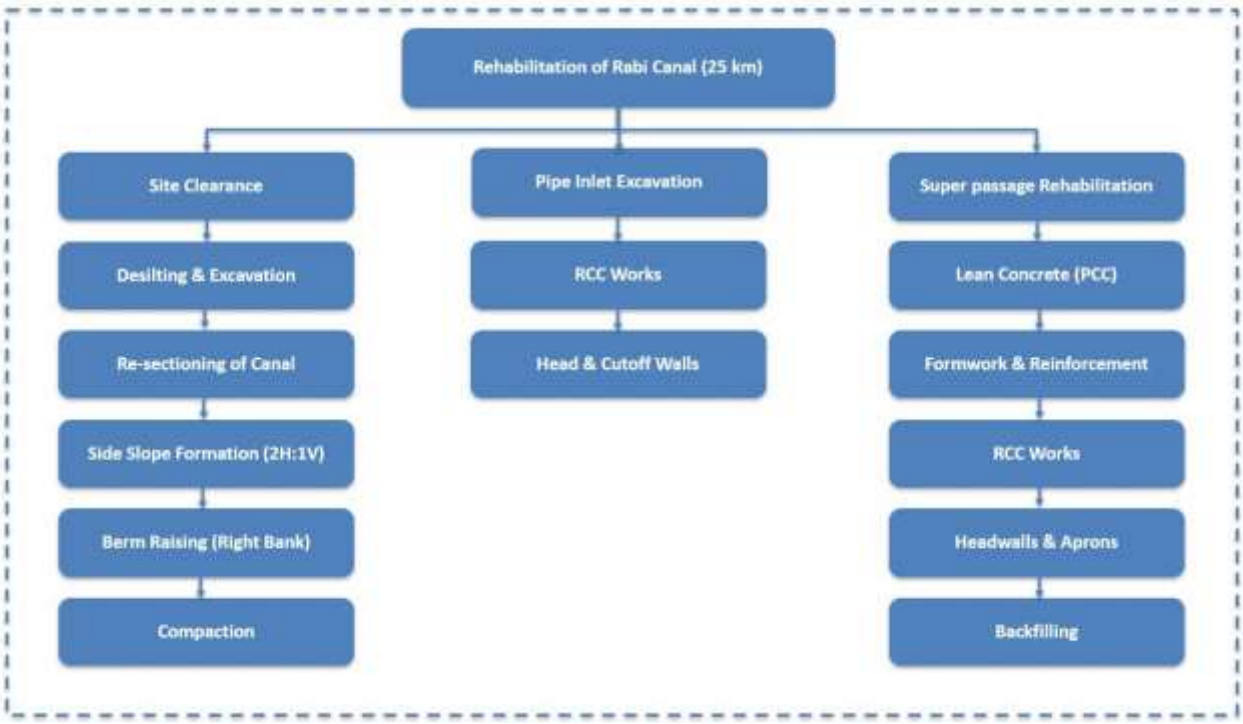

Figure-3: Project Activities Table 1-3: List of Construction Activities

Sr. No.	Work Activities	List of Associated Construction Activities
1	**Pre-construction Activities**	• Joint survey and alignment verification (RD 0+000 to 25+000) • Finalization of levels, slopes, and cross-sections

Sr. No.	Work Activities	List of Associated Construction Activities
		• Establishment of camp and site facilities • Mobilization of machinery and manpower
2	**During Construction Activities**	• Site clearance and desilting of canal bed • Re-sectioning and reshaping of 25 km canal • Bed slope correction and side slope formation (2H:1V) • Deepening/widening where required • Raising and strengthening of right bank embankment • Compaction of earthwork in layers • Rehabilitation of super passages (05 Nos.) • Construction of pipe inlets (08 Nos., Ø 0.60 m) with headwalls and aprons • Final dressing and finishing of canal section • Quality control and inspection

1.8 Work plan / Implementation Schedule of Project Activities & ESMP

The implementation schedule for the Integrated Flood Resilience and Adaptation Project (IFRAP) – Package IV: Restoration and Strengthening of Main Rabi Canal Flood Embankment from RD 0+00 to RD 25+000 has been prepared considering the proposed construction sequencing, safeguard implementation requirements, and overall project execution timeline. The overall implementation duration of the project is approximately eighteen months (18) months. The work plan includes procurement, contractor mobilization, construction activities, implementation of Environmental and Social Management Plan (ESMP) measures, environmental monitoring, reporting, and project close-out activities.

The implementation schedule has been developed to ensure integrated execution of engineering and environmental safeguard activities throughout the project lifecycle. Environmental compliance, occupational health and safety, and community protection measures shall remain active during all stages of construction and operation.

1.8.1 Bidding and Contract Award

The tendering and contract award activities are planned for approximately four (04) months. This phase includes tendering, bid evaluation, contract award, and issuance of Notice to Commence, along with incorporation of ESMP and occupational health and safety requirements in the contract documents.

1.8.2 Contractor Mobilization

Mobilization activities are scheduled for approximately three (03) months. The activities include deployment of personnel, mobilization of construction machinery, establishment of site offices, labour camps, storage yards, and testing laboratory facilities, along with preparation of site-specific environmental and safety plans.

1.8.3 Restoration and Strengthening of Main Rabi Canal Flood Embankment

The major construction works are scheduled for approximately eighteen (18) months. The works include earthworks, embankment strengthening, road culverts, road passages, and slope protection works including stone pitching and erosion control measures to improve flood resilience and hydraulic stability of the Main Rabi Canal flood embankment.

1.8.4 Environmental and Social Management Plan (ESMP) Implementation

Implementation of ESMP measures shall continue throughout the construction period for approximately nineteen (19) months. The activities include dust suppression, waste management,

ambient air and noise monitoring, occupational health and safety compliance, community consultations, and operation of the Grievance Redress Mechanism (GRM).

1.8.5 Project Deliverables and Reporting

Project deliverables and reporting activities shall continue throughout the implementation period. These include submission of shop drawings, ESMP implementation plans, monthly progress reports, environmental monitoring reports, and the final project completion report upon completion of works.

1.9 STUDY TEAM

Table 1-4: Consultant's Team

Sr. No.	Name	Position
1	Mr. Alamgir Khan	Project Coordinator
2	Mr. Idrees Khan	Environment specialist
3	Mr. Sanaullah Khan	Water Management Specialist
4	Mr. Shoaib Suleman	Design Engineer
5	Ms. Almas Khurshid	Environment specialist
6	Mr. Naqeeb Ullah	Social Specialist
7	Mr. Shakoor Kakar	Socio Economic baseline and Consultation
8	Ms. Sidra	Gender Specialist
9	Mr. Zarak Khan	Social field staff (Baseline Data collection)
10	Waqar Ahmed	Surveyor
11	Engr. Safdar Chana	Conducted Environmental Monitoring/Labs
12	Mili Khan	Environment field Assistant

2

LEGAL AND POLICY FRAMEWORK

2. LEGAL AND POLICY FRAMEWORK

2.1 LEGAL AND APPLICABLE REQUIREMENTS

ESMP is developed as per the World Bank Safeguard Policies, Environment and Social Standards (ESS), Environmental and Social Commitment Plan (ESCP). Environmental and Social Management Framework (ESMF) of the project and relevant provision of Environmental Policies laid out by the Government of Pakistan along with the national and international guidelines. The Project proponent will be required to adhere to these regulations throughout the course of the proposed Project.

2.2 ENVIRONMENTAL & SOCIAL STANDARDS (ESS) AND NATIONAL REGULATIONS

The sub-project has been carefully reviewed against the World Bank's Environmental and Social Standards (ESS1–ESS10) and the corresponding national regulatory framework, including the Balochistan Environmental Protection Act (BEPA 2012), National Environmental Quality Standards (NEQS), and other relevant sectoral laws such as the Factories Act 1934, Land Acquisition Act 1894, and Antiquities Act 1975. This cross-referencing ensures that the Environmental and Social Management Plan (ESMP) is fully compliant with both international requirements and national legislation. By integrating World Bank ESS obligations with Pakistan's regulatory provisions, the sub-project demonstrates a commitment to responsible environmental management, protection of community and worker rights, and transparent stakeholder engagement. This dual compliance framework provides assurance that the project will be implemented sustainably, with due consideration for people, biodiversity, and the environment.

2.2.1 World Bank Environmental and Social Framework (ESF)

The World Bank Environmental and Social Standards (ESSs) are a set of policies designed to ensure that projects financed by the World Bank are environmentally and socially sustainable. These standards are part of the Environmental and Social Framework (ESF), which has been in effect since October 01, 2018. The ESF replaces the earlier safeguard policies and introduces a more comprehensive and integrated approach to risk management in development projects. Ten ESS are as under

Table 2-1: Relevant World Bank ESS and Key Gaps with the National Framework

Environmental and Social Standards (ESS	Project Relevance	Relevant National Provincial Regulations and Laws	Gaps Identified in the Context of Local Laws	Gaps Addressed in ESMF
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	**Relevant:** The Project activities will involve a wide range of civil works from medium to relatively large scale which could have potential environmental and social risks[17]. The ESMF and the related site-specific E&S instruments will be implemented throughout the project to comply with ESS1.	• Balochistan Environmental Protection Act, 2012 • Guidelines for Environmental Assessment, Pakistan EPA • Review of IEE and EIA Regulations, 2020	The criteria mentioned in the Act for classifying environmental and social impact/risk is different than in the ESF. The categorizes the risk level of a project indirectly – mostly by project type and size. Furthermore, it does require commitment from the proponents for E&S measures implementation but not in the form of a separate environmental and social commitment plan. The different methods and tools (ESIA, environmental and social audit, cumulative 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 highlights the environmental and social risks and impacts associated with primary suppliers and disadvantaged or vulnerable groups while the local relevant laws do not. ESS-1 specifically mentions disadvantaged or vulnerable groups, the Act does not touch upon this theme directly.	E&S risk categorization of the Augmentation Works has been done on the basis of ESS-1 guidelines but also aligned with the BEPA requirements. The environmental and social assessment will be/is carried out as per ESS-1 for the proposed Project. In addition, Resettlement Policy Framework (RPF), Labor Management Procedures (LMP) and Stakeholder Engagement Plan (SEP) have been prepared as part of this Project. Mitigations proposed in this ESMF and the other E&S tools (e.g, RPF, LMP and SEP) have taken into consideration the marginalized and vulnerable groups.

Environmental and Social Standards (ESS	Project Relevance	Relevant National Provincial Regulations and Laws	Gaps Identified in the Context of Local Laws	Gaps Addressed in ESMF
ESS2 – Labor and Working Conditions	**Relevant:** The Project will involve direct workers, contracted workers, primary supply workers and community workers. Locally hired labor will be preferred where possible, except for skilled workers who may not be available in project locations. The project may create some labor related risks and impacts, which may include lack of skills and compliance with relevant laws and regulations, unsafe and unhealthy working conditions, and GBV/SEA/SH. To comply with the ESS-2, a Labor Management Procedure (LMP) and SEA/SH Action Plan will be developed as a part of the project.	• Balochistan Occupational Safety and Health Act, 2022 • Employment of Child Act 1991 • Balochistan Employment of Children (Prohibition & Regulation) Act, 2021 • The Balochistan Bonded Labour System (Abolition) Act, 2021 • Factories Act 1934 • Balochistan Factories Act, 2021 • Workmen Compensation Act 1923 and Rules 1961. • Balochistan Payment of Wages Act, 2021 • The Balochistan Minimum Wages Act, 2021 • The Balochistan Shops and Establishment (Amendment) Act, 2022 • The Balochistan Employees' Social Security Act, 2022 • Road Transport Workers Ordinance, 1961 • The Balochistan Industrial Relations Act, 2022	National and Provincial laws regarding labour rights address most of the requirements of the ESS2. 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 in general and protection against discrimination of religious minorities (many formal sector workers belong to religious minority groups) are not done effectively as detailed coverage of certain requirements is partial. There is no specific requirement for employers to establish a workers' grievance mechanism except grievance redress mechanisms are available within relevant government departments for citizens to lodge complaints i.e., chief minister complaint cell and citizen portal.	All the relevant risks and measures have been considered in this ESMF. Labor Management Procedures (LMP) have been developed for the proposed Project to mitigate the risks related to OHS issues. The LMP will be noted in the legal agreement and in the Environmental and Social Commitment Plan (ESCP). All of this has been done in accordance with the provincial and national laws and ESS-2 requirements.

Environmental and Social Standards (ESS	Project Relevance	Relevant National Provincial Regulations and Laws	Gaps Identified in the Context of Local Laws	Gaps Addressed in ESMF
ESS3 – Resource Efficiency and Pollution Prevention and Management	**Relevant:** The project is planned to have significant investment in re-construction of infrastructure which may cause generation of generate solid waste, dust issues, soil erosion, water pollution and include use of construction materials (like asphalt, sand, cement, gravel stone etc.). However, the project is adopting a 'building back better' approach with plans to include nature-based solutions (such as wetland restoration, vegetative riverbank protection, and other watershed protection measures), green techniques and includes activities for restoration and sustainable use of natural resources. Resource efficiency and pollution prevention measures have been included in the ESMF to comply with requirements of ESS3.	• National Energy Efficiency and Conservation Act, 2015 • Balochistan Environmental Protection Act, 2012 • Pakistan Climate Change Act, 2017 • National Environmental Policy, 2005	National and provincial laws address most of the requirements of ESS3, particularly on pollution prevention	The project is planned to have significant investment in re-construction of infrastructure which may cause generation of generate solid waste, dust issues, soil erosion, water pollution and include use of construction materials. Resource efficiency and pollution prevention measures have been included in the ESMF to comply with requirements of ESS3.
ESS4 – Community Health and Safety	**Relevant:** The project may cause community health and safety risks during civil works which include exposure to physical hazards, the traffic	• Balochistan Occupational Safety and Health Act, 2022 • Pakistan Penal Code, 1860 • National Disaster Management Act, 2010 • Balochistan Environmental	Local laws address most of the requirements of the ESS-4. However, detailed coverage has not been provided in the local laws (national and provincial) in	Relevant measures have been included in the ESMF to ensure the compliance with ESS4 that community health and safety is

Environmental and Social Standards (ESS	Project Relevance	Relevant National Provincial Regulations and Laws	Gaps Identified in the Context of Local Laws	Gaps Addressed in ESMF
	and road safety hazards, potential of GBV/SEA/SH risks from presence of project workers, spread of different transmittable communicable diseases, exploitation of economically disadvantaged or otherwise vulnerable individuals by project staff involved in the implementation of the programs, or by other project beneficiaries etc. Relevant measures have been included in the ESMF to ensure the compliance with ESS4 that community health and safety is adequately protected.	Protection Act, 2012	comparison to ESS-4.	adequately protected.
ESS5 – Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	**Relevant:** Land acquisition and resettlement is not anticipated, However, Resettlement Policy Framework (RPF) will be developed prior to commencement of civil works or infrastructure activities to respond to risks and impacts related to land acquisition and resettlement (if any), land-use, temporary economic and/or physical displacement, Anti Encroachment	• Land Acquisition Act 1894 The Land Acquisition (Amendment) Act, 2009	Screening is limited to physical survey of land, there is no consideration of social risks in the LAA No formal stakeholder consultations required by the LAA, or in host communities in case of resettlement No provisions are made for vulnerable groups in the LAA No provisions for livelihood restoration and improvement, and no additional assistance beyond compensation for land acquired and loss of livelihood in the LAA	RPF has been prepared as a part of this project, to address issues related to land acquisition, voluntary land donation, restrictions on land use and involuntary resettlement (if any) ESS5. Moreover, a GRM has been established.

Environmental and Social Standards (ESS	Project Relevance	Relevant National Provincial Regulations and Laws	Gaps Identified in the Context of Local Laws	Gaps Addressed in ESMF
	Drives/forced evictions along with relevant management and mitigation measures.		Land assets and structures are valued at market value in the LAA, instead of replacement cost in the ESS No compensation for non-titleholders in the LAA, while ESS5 requires all parties affected by land acquisition to be compensated.	
ESS6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources	**Relevant:** Most of the infrastructure investments are rehabilitation works and anticipated to exist within the existing built environment. However, it is assumed that some forests and protected areas have been damaged by floods. The activities proposed under component-4 are proposed to support watershed management and restore damaged rangelands which is expected to overall benefit the biodiversity of the area. Physical investments that could have significant adverse impacts to natural and critical habitats will be excluded from the project.	• National Forest Policy, 2015 • The Forest Act, 1927 • Balochistan Wildlife preservation protection conservation and management Act 2014 (BWPPCMA) • The Balochistan Forest Act 2022	Local laws address most of the requirements of the ESS-6 except the categorization of habitats (natural, critical and modified).	Most of the infrastructure investments are rehabilitation works and anticipated to exist within the existing built environment. The activities proposed under component-01 are proposed to support watershed management and restore damaged rangelands which is expected to overall benefit the biodiversity of the area. Physical investments that could have significant adverse impacts to natural and critical habitats will be excluded from the project.

Environmental and Social Standards (ESS	Project Relevance	Relevant National Provincial Regulations and Laws	Gaps Identified in the Context of Local Laws	Gaps Addressed in ESMF
ESS7 – Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	**Not relevant:** Pakistan's only recognized Indigenous Peoples, the Kalash, live in three valleys in the Chitral district of Khyber Pakhtunkhwa, which is not included in the Project Area.	NA	There is no law, national or provincial, dealing with the rights and protection of Indigenous Peoples	This ESS is not relevant as no indigenous people are found in the Project Area. Pakistan's only recognized Indigenous Peoples, the Kalash, live in 3 valleys in Chitral district of KP province, and Chitral is not included in the Project districts.
ESS8 – Cultural Heritage	**Relevant:** Since project investments include significant amount of civil works which includes excavation, ESMF will include chance find procedures and screening checklist which will guide the handling of cultural heritage discovered during commencement of Project activities. In addition, in case there are impacts recorded on a notified cultural heritage within the project implementation, a Cultural Heritage Management Plan (CHMP) will be prepared accordingly.	• Antiquities Act, 1975 • The Antiquities Act, 1975 (amended in 1990) • Balochistan Antiquity Act, 2014	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.	This ESMF however, has developed "Chance Find Procedure" to be followed during project implementation in case of any chance find physical culture resource.
ESS 9-Financial Intermediaries	**Not relevant:** This standard is not relevant, as Financial Intermediaries will not be used.	NA	NA	NA

Environmental and Social Standards (ESS	Project Relevance	Relevant National Provincial Regulations and Laws	Gaps Identified in the Context of Local Laws	Gaps Addressed in ESMF
ESS10 – Stakeholder Engagement and Disclosure	**Relevant:** Effective stakeholder engagement and information disclosure will be crucial to the project. This ESMF follows a structured approach to stakeholder engagement and public outreach that is based upon meaningful consultation and disclosure of appropriate information. A standalone SEP has been prepared, which will be periodically updated through the Project life.	• Review of IEE and EIA Regulations, 2000 • Balochistan Environmental Protection Act, 2012 • Guideline for Public Consultation, 1997	Stakeholder engagement in public sector development projects is not done effectively. The regulations do not demand continued stakeholder engagement after the NOC has been granted, leading to a potential disconnect between the project and the affected people during construction and operations phases. Also, there is no proper mechanism to record the grievances.	The SEP and GRM have been developed as a part of this ESMF as per ESS10. The SEP outlines the process and frequency of stakeholder engagement at all project stages, and also establishes the contours of an effective GRM

2.2.2 World Bank Occupational Health & Safety (OHS) Guidelines

Contractor will follow the Occupational Health and Safety Guidelines of International Finance Corporation (IFC) and World Bank Group during project's implementation stage. These guidelines are as under:

Occupational Health and Safety:

- General Facility Design and Operation
- Communication and Training
- Physical Hazards
- Chemical Hazards
- Radiological Hazards (if any)
- PPEs
- Special Hazard Environments
- Monitoring

Community Health and Safety:

- Water Quality and Availability
- Structural Safety of Project Infrastructure
- Life and Fire Safety (LFS)
- Traffic Safety
- Transport of Hazardous Materials
- Disease Prevention
- Emergency Preparedness and Response

Construction and Decommissioning:

- Environment
- Occupational Health and Safety
- Community Health and Safety

2.2.3 National/Provincial Guidelines and Policies

The ESMP also complies with the national/provincial environmental requirements defined through Pakistan Environmental Protection Act (PEPA) 1997 and subsequent Balochistan Environmental Protection act, 2012. The ESMP will consider the natural environment (air, water, and land); human health and safety; social aspects, transboundary and global environmental aspects including climate change and its implications, and induced impacts as well as the cumulative impacts of other development projects in the area.

National Environmental Policy (NEP), 2005

The National Environmental Policy (NEP) identifies a set of sectoral and cross-sectoral guidelines to achieve its goal of sustainable development. Section 5 of the policy commits for integration of environment into development planning as instrument for achieving the objectives of National Environmental Policy. Management of proposed project will ensure that the project will not add to the aggravation of the environmental issues identified in NEP and mitigation measures will be adopted to minimize or avoid any contribution of the project in these areas.

National Conservation Strategy (NCS)

The National Conservation Strategy (NCS) has 68 specific programs in 14 core areas in which policy intervention is considered crucial for the preservation of natural and physical environment. The core areas that are relevant in the context of the proposed project are pollution prevention and abatement, restoration of rangelands, conserving biodiversity, supporting plantations, and the preservation of cultural heritage.

Pakistan Climate Change Act 2017

The Project activities will involve a wide range of civil works from medium to relatively large scale, which would contribute to the significant use of natural resources, and generation of waste. The proposed project will ensure efficient use of resources through implementation of measures. This act is applicable in the sub project.

National Disaster Management Act, 2010

The Subproject involves re-construction of infrastructure, affected in Balochistan by the 2022 floods. The aim of the project is to build back better with improved infrastructure based on climate risks, improved engineering design standards, and improved construction and maintenance to enhance resilience. However, this act is applicable in the proposed sub project.

Balochistan Wildlife Preservation Protection Conservation and Management Act 2014 (BWPPCMA)

Direct impacts on biodiversity and natural resources is not anticipated as most of the infrastructure investments are rehabilitation works and anticipated to exist within the existing built environment. Physical investments that could have significant adverse impacts to natural and critical habitats will be excluded from the project.

Balochistan Antiquity Act, 2014

The Project investments include significant amount of civil works which include excavation, the site specific ESMP will include chance find procedures and screening checklist which will guide the handling of cultural heritage discovered during commencement of Project activities. In addition, in case there are impacts recorded on a notified cultural heritage within the project implementation, a Cultural Heritage Management Plan (CHMP) will be prepared accordingly.

Balochistan Employment of Children (Prohibition & Regulation) Act, 2021

Project interventions will involve different contractors and sub-contractors for the execution of the project; however, children may not be involved in direct or indirect employment with the contractors. Hence, the act is applicable in the proposed sub project.

Balochistan Payment of Wages Act, 2021

The workforce (direct workers, contracted workers, primary supply workers and community workers) in the proposed sub project will be involved during implementation stage. The project proponent will respect the provision of relevant sections of this act.

The Protection against Harassment of Women at the Workplace Act, 2010

In case of females are involved in the project activities, this act will be applicable. However, the proponent of the project will ensure the relevancy of this act to involvement of women.

Balochistan Factories Act, 2021

The sub project will involve in multi-dimensional works and the workers (direct workers, contracted workers, primary supply workers and community workers) which may involve in occupational and health related risks during construction phase. Hence, this act is applicable to provide safety to the workers.

2.2.4 International Treaties and Conventions

Pakistan is signatory to several multilateral environmental and social agreements. The proposed sub-project is obliged to respect the applicable agreements. The following are the relevant international treaties and conventions to which Pakistan is a party

Table 2-2: International Treaties

Sr. No	Environmental Obligations	Social Obligations
1	Convention on the Conservation of Migratory Species of Wild Animals	International Covenant on Economic, Social and Cultural Rights
2	Convention on International Trade in Endangered Species (CITES)	Convention on the Elimination of all Forms of Discrimination against Women, 1979.
3	United Nations Convention on Biological Diversity (UNCBD)	Discrimination (Employment and Occupation) Convention, 1958 (No. 111).
4	United Nations Framework Convention on Climate Change (UNFCCC)	Elimination of forced and compulsory labour (conventions 29 and 105)
5	Convention concerning the Protection of World Culture and Natural Heritage	Abolition of child labour (conventions 138 and 182)
6	Kyoto Protocol to the Convention United Nations Framework on Climate Change	International Covenant on Civil and Political Rights, 1966.
7	Stockholm Convention on Persistent Organic Pollutants	Elimination of discrimination in respect of employment and occupation (conventions 100 and 111)
8	Convention on Wetlands of International Importance	Hours of Work (Industry) Convention, 1919 (No. 1)
9	Paris Agreement, 2015.	Indigenous and Tribal Populations Convention, 1957 (No. 107)
10	Vienna Convention, 1985	Convention for Safeguarding the Intangible Cultural Heritage, 2003.

3

DESCRIPTION OF THE SUBPROJECT

3. DESCRIPTION OF THE SUBPROJECT

This chapter describes the salient features of the Subproject scheme that falls under Sub-Irrigation component of IFRAP. This component involves the restoration/rehabilitation of Main Rabi Canal flood embankment under Package – IV of IFRAP.

3.1 Location of Sub-project

Rabi Canal flood embankment is located in Naseerabad District. Location map of Rabi Canal is shown in Figure 3.1.

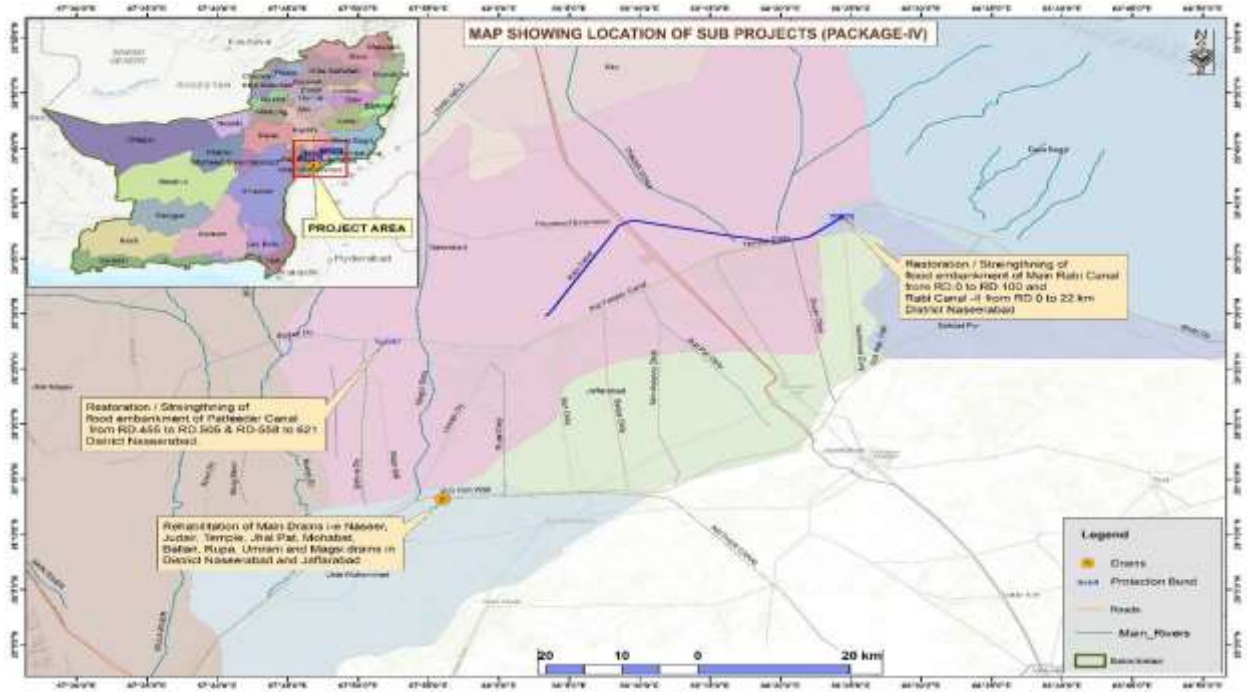

Figure -3.1: Location Map of Main Rabi Canal flood embankment

3.2 Restoration/Strengthening of Flood Embankment of Main Rabi Canal

The proposed flood embankment structures of Rabi canal are located on alluvial deposits. These alluvial deposits are developed by the deposition of sediment over a long period of time carried by the river coming from highland regions. The alluvial deposits along the structure sites are mostly Clayey Silt and Silty Clay.

Figure-3.2: Alluvial deposits along the damaged embankment.

Figure-3.3: Alluvial deposits (Clayey Silt and Silty Clay) along the Rabi Canal Bank.

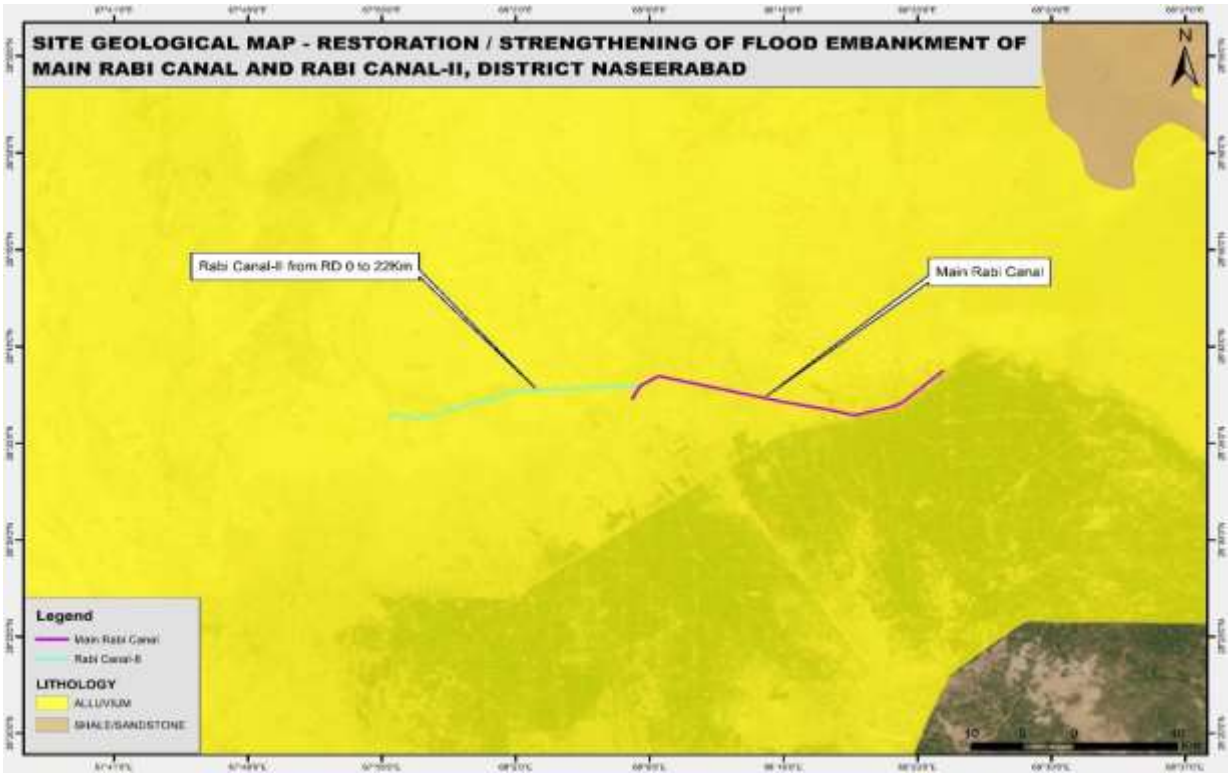

Figure-1.4: Surface geological map of Main Rabi Canal and Rabi Canal-II.

3.3 RAW MATERIAL SOURCE AND AVAILABILITY

Sources of different raw materials required for restoration of flood protection bund are given in the Table 3.2 below.

Table 3-1: Availability of construction material

Sr. No.	Raw material	Availability in the surrounding
1	Borrow material	The contractor will identify the site and get that approved by CSC.

Sr. No.	Raw material	Availability in the surrounding
2	Stones for retaining walls and rip rap.	The contractor will identify the most viable site for stones and CSC will approve accordingly.
3	Stone for sub-base, aggregate base course,	The site will be identified by the CC.
4	Sand	The contractor will identify the viable site for sand duly approved by the CSC.
5	Water for compaction and sprinkling.	Availability of water for construction activities will be a problem at the Subproject area. However, the CC will fix it with the approval of CSC.
6	Cement & Reinforcement materials	Since Rabi Canal is in the Naseer Abad district, therefore the access of market and availability of material will not be difficult. However, the CC will be responsible with the approval of CSC.

3.3.1 Borrow Material

Availability of suitable local natural materials in sufficient quantities in the vicinity of the project to minimize material processing, haulage distances and optimum utilization are the main considerations for the investigation of construction materials. During the present project planning studies, several sources of construction materials were identified which include riverbed material, terraces and natural rocks. Details of construction material are given below in borrow area map.

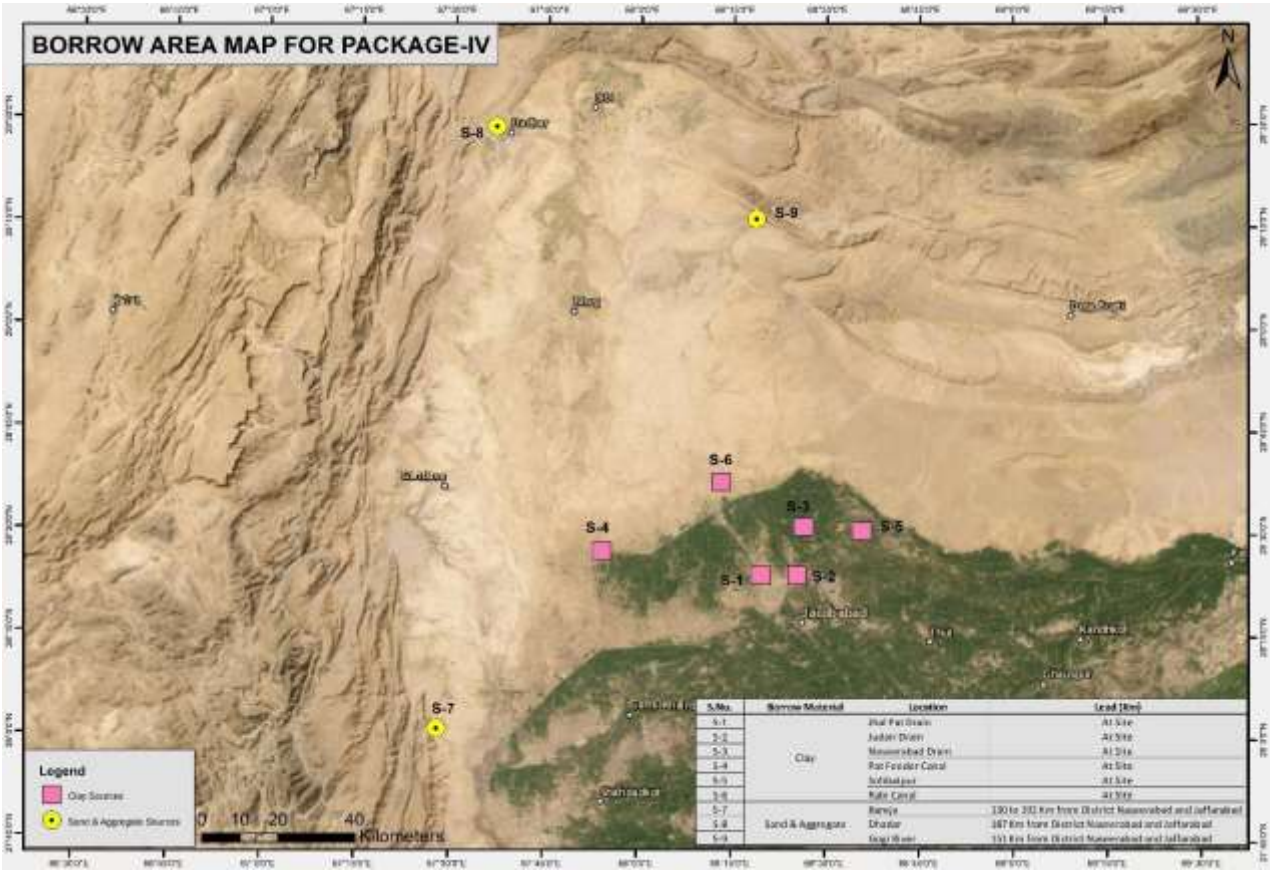

Figure 3.5: Borrow area map of Package IV

The borrow area map of Package-V highlights the distribution and availability of borrow materials required for construction, including clay, sand, aggregates and stone pitching, in the project region. The borrow sources are well-distributed, ensuring reliable material supply both at site and from nearby off-site locations.

Clay Sources

Multiple clay borrow sources are available at or near the project sites, such as Jhat Pat Drain (S-1), Judair Drain (S-2), Nasereabad Drain (S-3), Pat Feeder Canal (S-4), Sohbatpur (S-5), and Rabi Canal (S-6).

These sources are located within the alluvial plains and consist of fine-grained cohesive soils suitable for embankment construction and canal works. Their presence at site significantly reduces haulage distance and transportation costs, making them highly feasible for bulk material requirements.

Sand & Aggregate Sources

Coarse borrow materials such as sand and aggregates are available from upland and riverine sources outside the immediate project area.Major sources include Bareja (S-7) located 130–192 km from Naseerabad and Jaffarabad districts, Dhadar (S-8) located about 187 km away, and the Gogi River (S-9) about 151 km away. These sources provide durable aggregates and sandy material required for concrete works, filters, and other structural components. However, due to longer leads, their use will require careful planning of transportation logistics.

Pitching and Riprap

The stones required for pitching, rip rap and gabion slope protection are present at the nullah bed. The natural rock outcrops are also located 130 Km to 200 Km from the proposed sites of the structures.

Summary

The map confirms adequate availability of borrow materials for the project. Clay is abundantly available within close proximity to the sites, ensuring cost-effective supply for embankments and canal lining. Sand and aggregate sources are located at relatively greater distances in upland river channels, but they remain accessible for fulfilling structural construction requirements.

3.3.2 Contractor's Camp

The criteria for contractor's camp site will be 500m away from any residential dwelling and sensitive receptors. Since the Subproject patches has no population in its 100 m radius, and it may be called as away from social, physical and ecological sensitivity. Therefore, the establishment of contractor's camp will not be problem for the contractor.

The CC will be contractually bound to maximize employment of the local people of Rabi canal area and nearby villages. The machinery and equipment will be accommodated in the open yard or rented building in either Rabi Canal, Goth Haji Noor Muhammad Chakrani, Shori Data or nearby area that should have enough storage and haulage space with ample moving and working space.

3.3.3 Standards for the Construction of Workers Accommodation

Following are the best practices for the construction of contractor labor/workers accommodation:

Activity	Guidelines
Provision of Camp Facilities	Provide; • Lined washing areas • In-house common entertainment facilities. • Septic tanks and soaking pits; Solid waste management. • Fire prevention and firefighting equipment • Separate from living quarters, sheltered kitchen area. • Safe drinking water supply which meets the national standards • The minimum bed space allocated per person should be 4 feet in width and 6 feet in length. While observing Covid 19- social distancing SOPs, the distance from bed to bed shall be at least 06 feet. • Appropriate protection against heat, cold, damp noise, fire, and disease-carrying animals, in particular insects. • Lighting and electricity supply • Ventilation facility with availability of electricity, fans • Roads and paths • An adequate number of toilets and sanitary fittings shall be provided. (1 toilet, 1 hand wash basin, 1 bathroom with bench per 10 persons to be provided. • Provide plain cemented washable floor for easy cleaning in the kitchen and living areas Hygienic sanitary facilities and sewerage system. Provide separate latrines and bathing places for males and females with total isolation by the wall or by location. Female toilets should be marked in a language understood by the persons using them to avoid miscommunication. • Treatment facilities for sewerage of toilet and domestic wastes • Pave the internal roads with at least haring-bond bricks to suppress dust and to work against possible muddy surfaces during monsoon.
Cooking	• Provide a sheltered and ventilated kitchen area that is separated from living quarters • Provide fuel to the construction camps for their daily purpose use, to discourage them to use fuelwood or biomass. • Make available alternative fuels like natural gas or kerosene to the workforce to prevent them from using biomass for cooking.
Health and Hygiene	• Provide adequate drainage facilities throughout the camps to ensure that disease vectors' habitats (stagnant water bodies, puddles) do not form. • Place display boards at strategic locations within the camps containing messages on the best hygienic • Provide initial health screening of the laborers coming from outside areas. • Train all construction workers in basic sanitation and health care issues and safety matters, and on the specific hazards of their work. • Provide adequate health care facilities within campsites. • Provide first aid facility round the clock. Maintain stock of medicines in the facility and appoint a paramedic on site. • Provide a transport facility for the laborers during an emergency to be transported to the nearest hospitals • Provide GBV, SH, SEA and HIV awareness programming, including STI (sexually transmitted infections) and HIV information, education, and communication for all workers.

Activity	Guidelines
Safety	• Availability of fire extinguishers inside the camps • Provide the appropriate type of fire-fighting equipment suitable for the construction camps • Display emergency contact numbers clearly and prominently in strategic places in camps. • Encourage the use of flameproof material for the construction of the labor housing/site office. Ensure that these houses/rooms are of sound construction and capable of withstanding storms/cyclones • Communicate the roles and responsibilities of laborers in case of an emergency in the monthly meetings with contractors. • Provide appropriate security personnel (police /home guard or private security guards) and enclosures to prevent unauthorized entry into the camp area. • Evacuation plan and evacuation drills in labour camps
Drainage	• Regularly inspect and maintain drains • Provide a drainage system to transfer sewage effluent to the septic tank with a soakage pit of adequate capacity • Divert natural rainfall-runoff around the site location • Provide adequate storm-water drainage capacity to prevent the accumulation of stagnant water following heavy rains • Build new shallow v drainage lines as required for wastewater/rainwater run off to the nearby recipient water body • The presence of stagnant water is a factor in the proliferation of potential disease vectors such as mosquitoes, flies, etc., and must be avoided and away from campsites and the community.
Site Restoration	• Backfill waste and sewage pits • Consider seeding the area to provide an initial protective canopy • Give prior notice to the laborers before demolishing their camps/units • Maintain the noise levels within the national standards during demolition activities • Reuse the camp material to the maximum extent. Dispose of remaining debris at the designated waste disposal site. • To restore the site to its original condition or an agreed condition with the landowner defined before the commencement of the works (in writing). • Dismantle and remove from the site all facilities established within the construction camp, including the perimeter fence and lockable gates after the construction work. • Decommission and fill drinking water wells (unless otherwise arranged with the landowner) • If possible, dismantle camps in phases as the work decreases (do not wait for the completion of the entire work)

3.4 MACHINERY YARD AND OTHER FACILITIES

A repair workshop is essential to maintain many vehicles and other machinery required for project construction. The contractor may establish own workshop at a place approved by the PIU prior to its establishment. The machinery maintenance and equipment yard will be a designated place to be used only for workshop purposes. No construction vehicles will be allowed to park on the road.

3.5 SECURITY ARRANGEMENTS AND HEALTHCARE FACILITIES

Given the prevailing security conditions in the project area, security staff is important. Adequate security will be required at contractor's camp, material store, equipment yards and location of the

work in progress on the work site. Coordination will be necessary with nearby law enforcing agencies.

With many labours and employees working in the proposed project, small accidents are expected to take place on all construction sites. A dispensary will be set by the CC within the base camp.

The dispensary will be operated by the CC with full time paramedics. For major cases the patients will be shifted to the District Hospital under a pre-coordinated arrangement. Almost all the unskilled labour will be employed from the local area Goth Haji Noor, Goth Haji Imdad, Shori Data or Goth Mola Bukhsh. This will also keep the camps less pressurized and manageable.

3.5.1 Site Security

The mitigation measures and security recommendation are provided in the security management plan and will be implemented to strengthen the security of staff, workers and project facilities. The following mitigation measures will be implemented at all work sites.

Table 3-2: Impact Characterization-Site Security

Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance
Direct	Short Term	Irreversible	Rare	Severe	High adverse

3.5.1.1 Mitigations

All the work executed by or on behalf of the contractor (sub-contractor) in the performance of the work shall be in accordance with high standards of safety at all times and shall, inter alia, comply with local laws, and ensure strict adherence. The following mitigation measures shall be adopted by the contractor and project to deal with site security issues and emergencies at site:

3.5.1.2 Management Steps

The following are the management steps will be adhered:

- The project shall hire a security manager (Individual Consultant) who will supervise the implementation of recommended security measures and will help the project develop further plans policies and procedures related to security for the project.
- Where possible it will be ensured that the locals or those conversant with the area and customs must be hired for the guarding duties and thorough background checks will be done by the security company before deploying any guards at the site.
- It shall be ensured that physical measures such as a fence, barriers, gates, warning signage, and surveillance system are in place to prevent access to or passage through work areas, camps, and offices.
- The project shall ensure that the security personnel should be stationed at the entry and exit points of the sites, offices, and camps around the clock.
- Perimeter walls and entry points to all facilities should be well-lit at night and where electricity is not available solar/generator-backed-up lights can be used.
- The contractor will issue cards to the staff which will be checked at the entry points. The record of all the visitors will be maintained and will be checked by the OHS staff.
- The contractor shall maintain communication through employer with local police and other law enforcement agencies in the area about his construction activities especially if the construction area is near any sensitive place and movement of staff.
- In case of any suspicious activity observed at the camp or worksite, the contractor staff shall immediately inform about the situation to the management and private security

personnel. The private security personnel will immediately observe, report, and record the suspicious activity.

- In case of emergency, the private security personnel and site/camp management will contact police control, police station and patrolling parties of law enforcement agencies in the respective area to tackle the issue.
- The contractor shall not permit unauthorized person to enter the working site or camp areas. Only authorized persons will be allowed to enter the work site and in the camps.
- The contractor shall prepare emergency evacuation procedures under their health and safety management plan. Training should be provided to all staff on different emergency situations and drills should be conducted periodically.
- The emergency contact numbers of police department, fire department, nearby hospitals, rescue department shall be displayed at the camp sites and work areas.
- The project has developed a grievance redressal mechanism for the project to resolve complaints of public and project people. A public complaint center (PCC) and a grievance redressal committee has been established for this project. The public and project staff can register their complaints related to social issues, security issues and other aspects related to project in the complaint centre. Their complaint will be received and resolved within a given time frame. The complaints which were not resolved by PCC will be forwarded to grievance redressal committee (GRC) for resolution.

3.5.1.3 Emergency Preparedness and Response Procedures

i. Emergency Evacuation & Transfer

- The Contractor will nominate an incident response team which will be headed by HSE Manager. This team can be activated by verbal communication or radio. This will be the most rapid response in the camps and on site.
- In case of emergency, the emergency disaster siren will be blown to alert the staff and stop the work immediately. The security staff will ensure that all project personnel and workers leave the site by a safe route. The assembly area shall be marked in main camp area and work sites.
- Information related to (key persons to be contacted & telephone numbers) medical support during an emergency shall be made available to all on the project site to save time in communication.
- A close liaison will be maintained by the health and safety officer with a nearby hospital and Emergency response centers for assistance during an emergency.

ii. Emergency Drills

- All site personnel/members (PIU/ /Contractor) will follow emergency drills that shall be periodically tested through exercises. The frequency of these drills shall be every quarter which includes fire Fighting, medical evacuation and patient transfer. The schedule of these drills shall be planned on-site in accordance with site activities and be made part of the contractor health and safety plan.
- The finding of the observations and debrief notes of the emergency drills shall be recorded. The health and safety officer shall analyze the findings and identify any remedial actions required.
- The emergency procedure shall be updated from time to time to reflect observations made.
- Training shall be conducted on regular basis for emergency response teams.

- During toolbox talk, the supervisor must emphasize how to raise an emergency and emergency response protocol associated with the work shall also be discussed with it.

3.5.1.4 Residual Impact

By applying the above mitigations, the impact significance shall be medium during the duration of the sub project implementation.

3.6 LABOUR REPORTING OFFICE

Designated labour gathering areas will be established along access roads and within the work bases of the contractor's camp. These areas will be used for worker pick-and-drop, emergency assembly, and routine briefings. Each location will be clearly marked, kept clean and unobstructed, and equipped with a public-address system when required.

The Labour Reporting Office, however, will be located separately - close to and adjacent to the contractor's main camp office-to facilitate easy movement, supervision, and daily reporting.

In addition, the contractor will ensure that all labour gathering points are safe, well-maintained spaces where workers can assemble for transport, respond during emergencies, or receive awareness and toolbox trainings.

4

BASELINE DESCRIPTION

4. BASELINE DESCRIPTION

This chapter provides the description of physical, ecological and socioeconomic conditions of the proposed subproject. The baseline has been prepared considering the primary data collection tools and published and un-published information/data.

4.1 CORRIDOR OF IMPACT (COI)

The Corridor of Impact (COI) comprises the subproject Right of Way (RoW) and the surrounding areas where both positive and negative impacts are anticipated during project execution, including construction camps, borrow pits, and disposal sites. For the purpose of impact assessment and baseline survey, a buffer zone of 500 m (250 m on each side of the centreline) has been defined as the primary Area of Influence and sensitive receptor zone.

As illustrated in Figure 4.1, this 500 m buffer (hatched area within the red circle) was assessed to capture potential direct impacts such as dust, noise, and vibration, as well as indirect and cumulative effects. The survey findings indicate that within this defined COI, no settlements, public infrastructure (e.g., schools or hospitals), or environmentally sensitive features were identified.

Accordingly, the ESMP adopts this 500 m COI to ensure a practical yet comprehensive framework for impact assessment and management, while maintaining compliance with applicable environmental and social safeguard requirements.

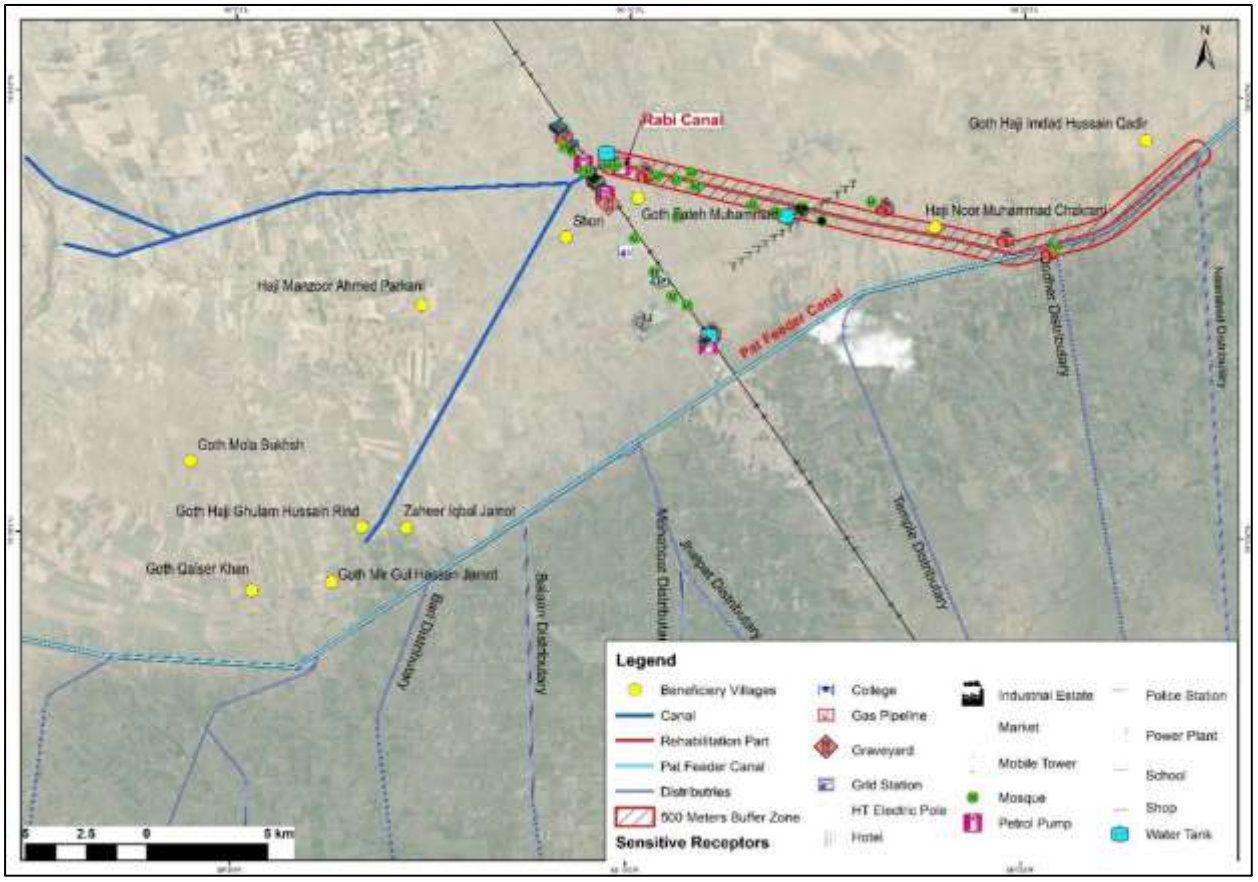

Figure-**Error! No text of specified style in document.** -1: Map showing Buffer Zone along with receptors

4.2 PHYSICAL ENVIRONMENT

4.2.1 Climate

The climate of the sub-project area in District Naseerabad is characterized by a subtropical desert environment, with long, hot summers and relatively mild winters. The district is situated at an elevation of approximately 674 m above sea level, which influences its temperature variations.

Average annual temperatures range between 17.5°C (63.5°F) in winter and 28.8°C (83.8°F) in summer, with peak summer temperatures often exceeding 40°C (104°F) during May and June, making these the hottest months of the year. Rainfall is scarce, averaging only 12–13 mm annually, and occurs sporadically, reflecting the arid nature of the region. Winters are shorter and less severe compared to the prolonged summer season. There shall be no impact on the climate of the scheme area, as no anthropogenic activities are proposed during the construction or operation phase of the scheme, with the overall aim of these interventions being to rehabilitate the post flood damages and to improve the water distribution system for proposed areas.
(Climate Naseerabad: Weather By Month)

Table 4-1: average temperature of Rabi Canal Subproject Area

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C	24.6	29.6	35.5	38.4	42.4	44.3	45.3	44.3	40.4	37.4	30.6	26.6	45.3
Average low °C	6.32	9.01	14.7	20.1	24.6	26.6	26.7	25.4	21.3	16.6	11.6	6.98	17.5
Record low °C	2.96	0.99	2.96	10.8	16.8	17.7	16.8	15.8	9.85	6.9	2.96	-2.96	-2.96
Average precipitation mm	22.3	39.1	33.8	20.1	10.1	0.51	1.15	4.8	0.11	2.64	15.2	3.5	12.8

Source; Weather & Climate.com / Naseerabad

4.2.2 Average Temperature

The below figure represents modelled data where mean monthly maximum and minimum temperatures for different months of the last 30 years. The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Naseer Abbad. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years.

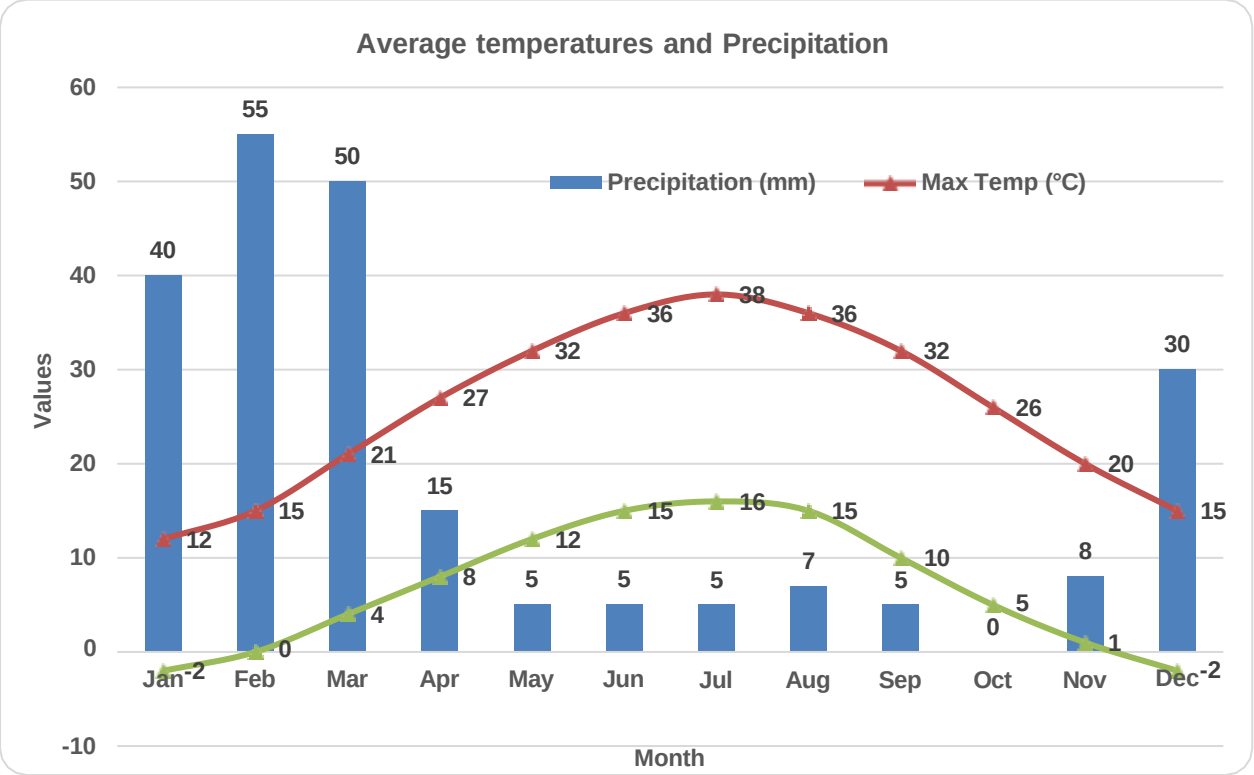

Figure 4 -1: Average temperatures of Flood protection bund at Main Rabi Canal area, District Naseerabad

4.2.3 Topography

District Naseerabad is located in the southeastern portion of the Balochistan province in the Kachhi Plain/ Basin area, which consists of flat valleys amid various mountain and hill ranges. It is surrounded on the west by the Kirthar and Central Bolan Ranges and on the northeast by the Marri and Bugti hills. Other smaller hill ranges skirting the district are ranges of low hills called Pab Hills.

4.2.4 Geology and Soil

The soil of Naseerabad district comprises silt, clay, silt loam, clay loam, and sandy loam. On the basis of the soil reconnaissance, soil in the command area, constituting the largest area of Dera Murad Jamali subdivision can be classified as sandy and loamy soil. It is more loamy soil in dense agricultural field. In the Chattar sub-division, the area is sandy and clay loam.

4.2.5 Hydrology

The catchment areas for the proposed Flood Protection Interventions were delineated using the Shuttle Radar Topography Mission (SRTM) 30 m Digital Elevation Model (DEM). Since multiple streams intersect the canal, more than one catchment has been identified along their lengths, as shown in Figure 4-2.

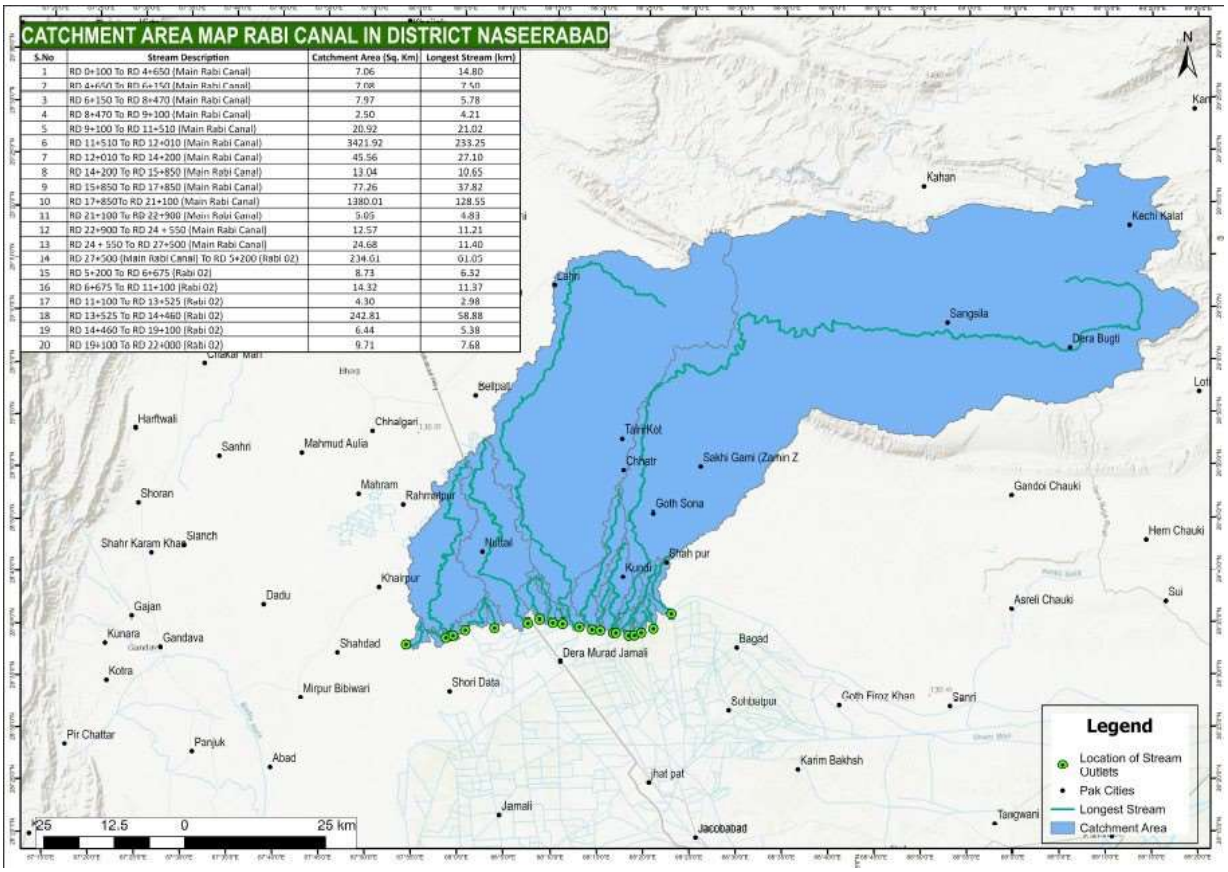

Figure 4-2: Location and catchment area map of Flood protection bund at Main Rabi Canal.

4.2.5 Water Resources

There is no perennial river flowing through the district Naseerabad and the district depends on the canal for its surface water. A few hill torrents, occasionally bringing flood waters, enter the district on the north from the Bugti hills, but are lost in the sand hills before they proceed very far into the district. The principal of these hill torrents are Goranari, Nilagh, Phanyan, Ghari Manak, Dingrizo, Bari, Kabula, and Bagh. Pat Feeder Canal (PFC) is the only perennial surface water channel in the project area. Large aquifer sources of groundwater underline the Indus basin. They form an important source of water supply throughout the project area with the use of tube wells, motorized

pumps and hand pumps. Groundwater in the Indus basin is, however, of variable quality and tends to be non-saline only near the surface water bodies. Water is generally saline. Aquifers are recharged by means of seepage during flood season. The depth of groundwater table varies from 8 metres to 15 metres in the project area.

4.2.6 Geo-physical Layout

District Naseerabad is located in the south-eastern part of Balochistan Province and forms part of the fertile Kachhi Plain, which extends into the Indus Basin. The district lies between latitudes 28°00′ N to 28°40′ N and longitudes 67°30′ E to 68°25′ E. It serves as the gateway between the Balochistan highlands and the Sindh plains, making it a vital transitional zone both geographically and hydrologically. The area is characterized by flat and low-lying topography with an elevation ranging between 50 and 80 meters above mean sea level. The terrain is composed of extensive alluvial deposits derived from the Nari River and its tributaries, forming fertile soils that support irrigated agriculture. However, due to poor natural drainage, the district is prone to seasonal flooding, waterlogging, and salinity during heavy rainfall or excessive canal discharge. The Pat Feeder Canal, originating from the Guddu Barrage, is the main irrigation source sustaining agricultural productivity and local livelihoods. Geomorphologically, Naseerabad falls within the Indus Basin alluvial system, featuring floodplains, levees, and old river channels formed through continuous fluvial processes. Implementation of the proposed scheme in this area will not disturb or alter the existing geo-physical layout, nor will it significantly influence flood control or hydrological characteristics of the region.

4.2.7 Climate Risks and Vulnerabilities in the Project Area

The increasing trend in frequency and magnitude of floods in river basin adjacent to the PLB area indicated that flooding may be considered the most important climate risk for the Project. Water flow condition exceeding the systems' design capacity can cause flooding or inundation of water conservation structures. High flood events can also lead to increased deterioration or damage of project structures resulting in more frequent maintenance and rehabilitation.

4.2.8 Seismology

According to the seismic zone map of Pakistan, district Naseerabad lies in Zone 3, 2A and which means 'moderate' to 'severe' damage can occur due to earthquakes. While Killa Abdullah is located in the active seismic region, which is Zone 4 on the Seismic zone map of Pakistan, which means 'severe' damage due to earthquakes can occur in this zone.

The maximum magnitude of each source is calculated, and Peak Ground Acceleration (PGA) values based on the maximum credible earthquake of the relevant source are obtained. According to the Building Code of Pakistan (BCP-2021), the project structures are situated in a Seismic Zones with Peak Ground Acceleration (PGA) in the range of 0.33 to 0.44g for scheme no. 01, 0.33 to 0.38g for scheme no. 02 and 0.24 to 0.33g for scheme no. 03.

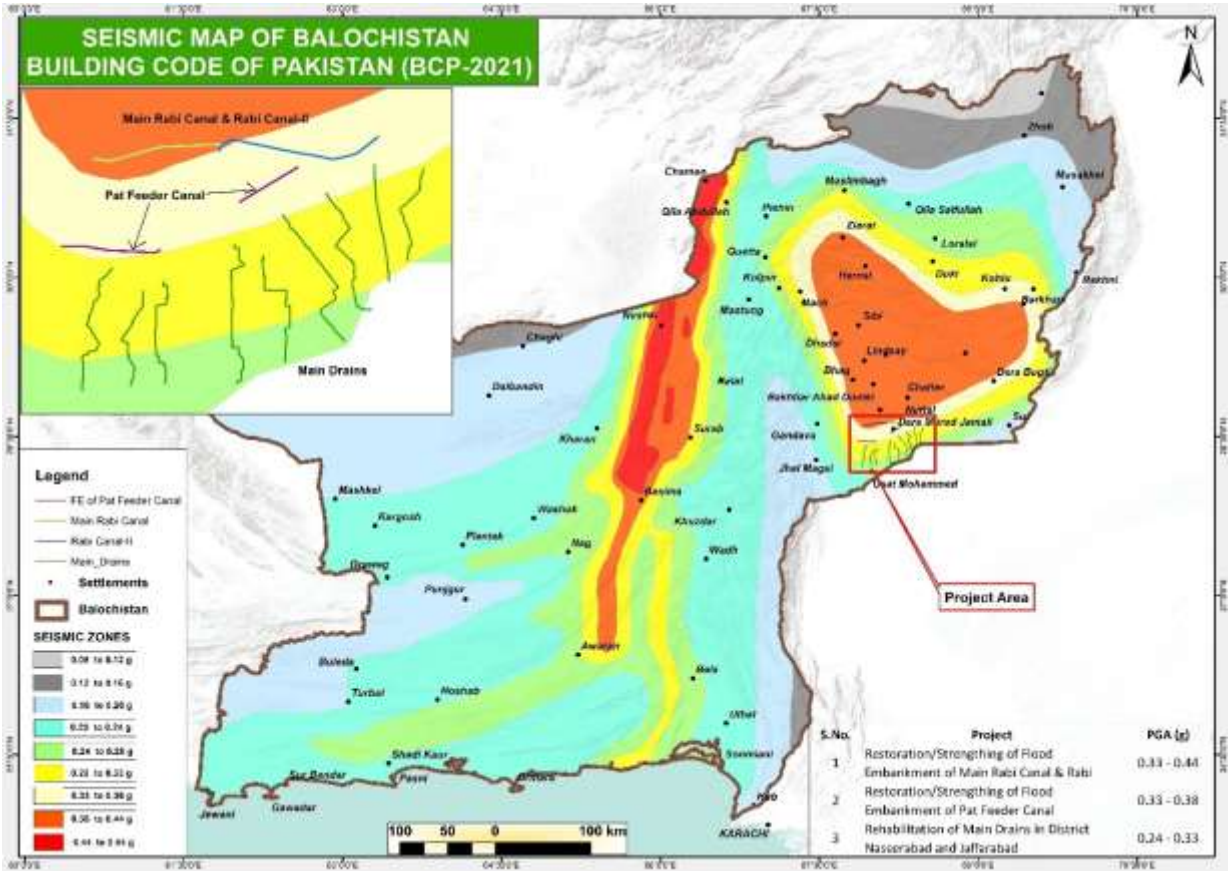

Figure 4-3: Seismic map of Balochistan showing the locations of the proposed scheme/structures.

4.2.7 Ambient Air Quality

The ambient air quality pollutant testing was carried at the location of flood protection bund. Overall air quality is fair. The pollutants monitored are particulate matter (PM_{10}), nitrogen oxides (NO), fine particles, Sulphur dioxide (SO_2), carbon monoxide (CO), coarse particles, and ammonia. The tested pollutants were compared with the NEQs and World Bank standards and found within the permissible limits. This reflects that ambient air quality in these areas is generally very good. The recorded levels were associated with vehicular traffic was found where roads pass nearby of the sub-project area

Table 4-4: Air Quality Analysis

Parameters	Temp.	NO (µg/m³)	NO_2 (µg/m³)	SO_2 (µg/m³)	CO (mg/m³)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	SPM (µg/m³)	O_3 (mg/m³)
NEQS & BEQS Limit	**-**	**24 hrs (40 µg/m3)**	**24 hrs (80 µg/m3)**	**24 hrs (120 µg/m3)**	**08 hrs (40 µg/m3)**	**24 hrs (5 mg/m3)**	**24 hrs (150 µg/m3)**	**24 hrs (500 µg/m3)**	**01 hrs (130 µg/m3)**
WHO Limit	**-**	**-**	**24 hrs (25 µg/m3)**	**24 hrs (40 µg/m3)**	**08 hrs (08 µg/m3)**	**24 hrs (15 mg/m3)**	**24 hrs (45 µg/m3)**	**-**	**Peak season (60 µg/m3)**
Time		**Results**							
10:00AM	35°C	19.5	38.5	7.1	0.0415	30.4	82.5	113	05
11:00AM	35°C	13.7	31.1	7.6		24.9	82.2	107.1	-
12:00PM	35°C	18.5	37.6	8.1	0.05	24.7	97.1	124.5	-
01:00PM	35°C	21.6	40.8	9.1		28.2	94.9	118.8	-
02:00PM	34°C	14.2	38.4	8.9		23.5	93.6	119.2	-
03:00PM	35°C	14	38.8	8.7	0.061	23.2	96.4	122.2	-
04:00PM	37°C	14.9	42.9	8.2		20.5	104.1	124.6	-

Parameters	Temp.	NO (µg/m³)	NO_2 (µg/m³)	SO_2 (µg/m³)	CO (mg/m³)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	SPM (µg/m³)	O_3 (mg/m³)
05:00PM	36°C	20.7	35.2	9.3		20.7	102.1	125.9	-
06:00PM	35°C	11.2	41.4	7.8	0.043	22.8	96.7	125.5	-
07:00PM	35°C	16.7	31.7	7.3		28.9	91.2	123.8	-
08:00PM	29°C	10.9	32.6	7.9		24.4	98.1	127.5	-
09:00PM	28°C	12.7	28.7	8.4	0.036	29.6	95.4	106.3	-
10:00PM	27°C	14	21.3	2.4		30.1	87.2	117.3	-
11:00PM	29°C	16.8	26	3.7		26	81.4	110.5	-
12:00AM	26°C	10.9	26	6.2	0.026	27.3	81.1	108.4	-
01:00AM	29°C	6.1	22.5	0.5		18.8	70.4	89.2	-
02:00AM	28°C	6.1	20.5	0.8		21.7	68.7	96.5	-
03:00AM	28°C	8	19.2	0.3	0.027	28.8	65.2	94	-
04:00AM	28°C	5	25.5	4.7		21.9	69.7	112	-
05:00AM	32°C	14.8	25.5	4.7		30	62.7	93.5	-
06:00AM	32°C	14.4	26.3	5.5	0.035	24.5	59.3	80.4	-
07:00AM	29°C	7.8	16.3	3.1		29.5	64.3	93.8	-
08:00AM	29°C	11.6	28.1	1.9		27.9	67.2	95.1	-
09:00AM	29°C	11.6	28.1	1.9	0.0416	25.9	107.1	-	05

Table 4-5: Ambient Air Quality Analysis

Sr	Measuring Parameters	Unit	WHO Limit	NEQS & BEQS Limits	Average Test Result	Remarks
1	Oxide Of Nitrogen as (NO)	µg/m³	-	40 (24 hrs.)	12.9	WL
2	Oxide Of Nitrogen as (NO_2)	µg/m³	25 (24 hrs.)	80 (24 hrs.)	30.8	WL
3	Sulphur Dioxide (SO_2)	µg/m³	40 (24 hrs.)	120 (24 hrs.)	5.3	WL
4	Carbon Monoxide (CO)	mg/m³	4 (24 hrs.)	5 (08 hrs.)	0.0416	WL
5	Particulate Matter (PM 2.5)	µg/m³	15 (24 hrs.)	35 (24 hrs.)	25.9	WL
6	Particulate Matter (PM 10)	µg/m³	45 (24 hrs.)	150 (24 hrs.)	78.8	WL
7	SPM	µg/m³	-	500 (24 hrs.)	107	WL
8	Ozone (O_3)	µg/m³	60 (Peek Season)	130 (01 hr.)	5	WL

4.2.8 Water Quality

Water quality of the Subproject has been monitored at two locations for eight hours, and The results indicated that certain biological parameters in the groundwater exceeded the permissible limits prescribed under the National Environmental Quality Standards (NEQS). The average concentrations are shown under Table 4.6 and Table 4.9 above.

a) Surface Water Quality

Table 4-6: Surface water quality at Rabi Canal Flood Protection Bund

Sr	Parameters	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Result	Remarks
1	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	< 1000	< 1000	< 1000	320	-
2	Total Hardness	As COCO3(mg/L)	APHA 2340-C	< 500	————	< 500	-	WL
3	Fluoride	F-1 (mg/L)	APHA 4500-F-1	≤1.5	1.5	≤ 1.5	0.82	WL

Sr	Parameters	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Result	Remarks
4	Chloride	Cl-[1] (mg/L)	APHA 4500-C1-1	< 250	250	< 250	149	WL
5	Cyanide	CN-[1](mg/L)	HACH Method 8027	≤ 0.05	0.07	≤ 0.05	ND	WL
6	Nitrate	NO2[1] (mg/L)	HACH Method 8192	≤ 50	50	≤50	0.21	WL
7	Nitrite	NO3[1] (mg/L)	APHA 4500-NO21-B	≤3.0(P)	3	≤3.0(P)	0.08	WL
8	Antimony	Sb (mg/L)	ASTM D-3697	≤0.005	0.02	≤0.005	ND	WL
9	Aluminum	Al(mg/L)	ASTM D-857	≤ 0.2	0.2	≤0.2	0.09	WL
10	Arsenic	As (mg/L)	ASTM D-2972	≤ 0.05	0.01	≤ 0.05	ND	WL
11	Boron	3 (mg/L)	ASTM D-3082	0.3	0.3	0.3	ND	WL
12	Barium	Ba(mg/L)	ASTM D-4382	0.7	0.7	0.7	0.005	WL
13	Chromium Total	Cr(mg/L)	ASTM D-1687	≤ 0.05	0.05	≤0.05	ND	WL
14	Copper	Cu (mg/L)	ASTM D-1688	2	2	2	<0.08	WL
15	Cadmium	Cd(mg/L)	ASTM D-3557	0.01	0.003	0.01	ND	WL
16	Lead	Pb(mg/L)	ASTM D-3559	≤ 0.05	0.01	≤ 0.05	ND	WL
17	Manganese	Mn(mg/L)	ASTM D-858	≤0.5	0.5	≤0.5	ND	WL
18	Mercury	Hg (mg/L)	ASTM D-3223	<0.001	0.001	≤ 0.001	ND	WL
19	Nickel	Ni(mg/L)	ASTM D-3866	≤0.02	0.02	≤ 0.05	ND	WL
20	Selenium	Se(mg/L)	ASTM D-3858	0.01	0.01	0.01	ND	WL
21	Zinc	Zn (mg/L)	ASTM D-1691	5	3	5	0.10	WL

*WL (Within Limits)

b) Ground Water Quality

Table 4-7: Ground water quality at Rabi Canal Flood Protection Bund

Sr	Measuring Parameter	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Results
1	Temperature AT 40 °C	°C	By Calibrated Thermometer	40 ≤ 60°	40 ≤ 60°	40 ≤ 60°	32.1
2	pH @ 25 °C	pH	ASTM-D3-166	6.0 ≤ 60°	6.0 ≤ 60°	6.0 ≤ 60°	71.4
3	Biological Oxygen Demand	BOD_5 (mg/L)	APHA 2510	80 ≤ 60°	80 ≤ 60°	80 ≤ 60°	69.2
4	Chemical Oxygen Demand	COD (mg/L)	ASTM-D3-152	150 ≤ 60°	150 ≤ 60°	150 ≤ 60°	136.5
5	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500 ≤ 60°	3500 ≤ 60°	3500 ≤ 60°	195.1
6	Suspended Solids	SS (mg/L)	ASTM-D5-151	200 ≤ 60°	200 ≤ 60°	200 ≤ 60°	136.2
7	Oil & Grease	O&G (mg/L)	ASTM-D5-151	1000 ≤ 60°	1000 ≤ 60°	1000 ≤ 60°	156.8
8	Chloride	Cl^- (mg/L)	ASTM-D5-152	1000 ≤ 60°	1000 ≤ 60°	1000 ≤ 60°	516
9	Phenolic compound	PhOH (mg/L)	ASTM-D3-178	0.3 ≤ 60°	0.3 ≤ 60°	0.3 ≤ 60°	ND
10	Fluoride	F^- (mg/L)	APHA 4500-F	10 ≤ 60°	10 ≤ 60°	10 ≤ 60°	3.5
11	Sulfide	S^{2-} (mg/L)	ASTM-D5-158	0.3 ≤ 60°	0.3 ≤ 60°	0.3 ≤ 60°	ND
12	Sulfate	SO_4^{2-} (mg/L)	ASTM-D5-156	0.3 ≤ 60°	0.3 ≤ 60°	0.3 ≤ 60°	ND
13	Selenium	Se (mg/L)	APHA 4500-Se	1.0 ≤ 60°	1.0 ≤ 60°	1.0 ≤ 60°	ND

Sr	Measuring Parameter	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Results
14	Ammonia	NH_3 (mg/L)	ASTM-D3-166	40 ≤ 60°	40 ≤ 60°	40 ≤ 60°	15
15	Cadmium	Cd^{2+} (mg/L)	ASTM-D5-157	0.1 ≤ 60°	0.1 ≤ 60°	0.1 ≤ 60°	ND
16	Chromium Hexavalent	Cr^{6+} (mg/L)	APHA 3500-Cr	1.0 ≤ 60°	1.0 ≤ 60°	1.0 ≤ 60°	ND
17	Cyanide	CN^- (mg/L)	ASTM-D5-155	0.5 ≤ 60°	0.5 ≤ 60°	0.5 ≤ 60°	ND
18	Mercury	Hg (mg/L)	KI-Method	0.01 ≤ 60°	0.01 ≤ 60°	0.01 ≤ 60°	ND
19	Nickel	Ni^{2+} (mg/L)	HACH Diameter Dynamic Method	1.0 ≤ 60°	1.0 ≤ 60°	1.0 ≤ 60°	ND
20	Zinc	Zn^{2+} (mg/L)	ASTM-D5-153	50 ≤ 60°	50 ≤ 60°	50 ≤ 60°	ND
21	Total Iron	Fe (mg/L)	APHA 3500-Fe	80 ≤ 60°	80 ≤ 60°	80 ≤ 60°	ND
22	Manganese	Mn (mg/L)	APHA 3500-Mn	1.5 ≤ 60°	1.5 ≤ 60°	1.5 ≤ 60°	ND
23	Boron	B (mg/L)	APHA 4500-B	600 ≤ 60°	600 ≤ 60°	600 ≤ 60°	ND
24	Arsenic	As (mg/L)	Polymer Kit	1.0 ≤ 60°	1.0 ≤ 60°	1.0 ≤ 60°	ND
25	Copper	Cu^{2+} (mg/L)	HACH Diameter Method	1.0 ≤ 60°	1.0 ≤ 60°	1.0 ≤ 60°	ND
26	Chlorine	Cl_2 (mg/L)	HACH DPD Method	1.0 ≤ 60°	1.0 ≤ 60°	1.0 ≤ 60°	ND
27	Aluminum	Al^{3+} (mg/L)	HACH Diameter Dynamic R	2.0 ≤ 60°	2.0 ≤ 60°	2.0 ≤ 60°	ND
28	Barium	Ba^{2+} (mg/L)	ASTM-D5-152	1.5 ≤ 60°	1.5 ≤ 60°	1.5 ≤ 60°	ND
29	Temperature AT 40 °C	°C	By Calibrated Thermometer	40 ≤ 60°	40 ≤ 60°	40 ≤ 60°	32.1
30	pH @ 25 °C	pH	ASTM-D3-166	6.0 ≤ 60°	6.0 ≤ 60°	6.0 ≤ 60°	71.4
31	Biological Oxygen Demand	BOD_5 (mg/L)	APHA 2510	80 ≤ 60°	80 ≤ 60°	80 ≤ 60°	69.2
32	Chemical Oxygen Demand	COD (mg/L)	ASTM-D3-152	150 ≤ 60°	150 ≤ 60°	150 ≤ 60°	136.5

c) Biological Water Quality

Table 4-8: Biological water quality at Rabi Canal Flood Protection Bund

Parameters	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Result	Remarks
Total Cells Count	TPC (count/m)	Total Waste Count	-	-	-	-	WL
Total Cells Count	TC (count/m)	AWH-AWS BW	0/100 ml	0/100 ml	0/100 ml	ND	WL
E-Coli	EC(count/m)	Total Visible Count	0/100 ml	0/100 ml	0/100 ml	79	OL
Focal Coli	FC (count/m)	AWH-AWS BW	0/100 ml	0/100 ml	0/100 ml	149	OL
Thickity	NTU	HACH Thickity meter	-	<15	<15	<0.00	WL
Other	Basic	Sensory Evolution	Only Not Only	Only Not Only	Only Not Only	Not Only	Not Only

Parameters	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Result	Remarks
Other	Other	Sensory Evolution	Only Not Only	Only Not Only	Only Not Only	Not Only	Not Only
Other	TCU	H-Cu method	≤ 15 TCU	≤ 15 TCU	<4	WL	WL
Phenolic Compounds	As Phased (mg/L)	ASTM D-175	-	-	-	-	WL
Residual chlorine	G2 (mg/L)	HACH Method 8167	0.24 S	0.24 S	0.24 S	0.9	WL
pH 60.25 °C	PH	ASTM D-185	≤ 16 S	≤ 6.3 S	≤ 6.3 S	≤ 6.3 S	WL

d) Noise Record

Table 4-9: Noise Record at Rabi Canal Flood Protection Bund

Measuring Parameter	Testing Instrument	Noise Test Report WHO Limit	NEQS & BEQS Limits	TIME	Results
Noise Level	Noise Meter	65 dB(A) (Day time)	75 dB(A) (Day time)	10:00 AM	65.2
				11:00 AM	61.8
				12:00 PM	64.5
				3:00 PM	68.3
				6:00 PM	59.2
				7:00 PM	66.7
				8:00 PM	57.7
				9:00 PM	60.4
				10:00 PM	63.8
				11:00 PM	55.4
				12:00 AM	50.9
				1:00 AM	45.6
				2:00 AM	51.8
		55 dB(A) (Night time)	65 dB(A) (Night time)	3:00 AM	54.5
				4:00 AM	56.3
				5:00 AM	44.8
				6:00 AM	54
				7:00 AM	50.2
				8:00 AM	57.2
				9:00 AM	57.5
				10:00 AM	57.5
		65 dB(A) (Day time)	75 dB(A) (Day time)	11:00 AM	57.5
				12:00 PM	57.5
				10:00 AM	65.2
				Average Result	57.31

4.3 ECOLOGICAL ENVIRONMENT

This section of ESMP provides brief information on the biological aspects (i.e., Mammals, avifauna, reptiles, and amphibians), and land patterns present in the surrounding of the scheme area.

4.3.1 Flora

The types of vegetation found in the district belong to the tropical thorn forests Vegetation Zone, with major tree species including kandi (Prosopis cineraria), karir (Capparisaphylla), peelu (Salvadora oleoides), ghaz/farash (Tamarix aphylla), and ber (Zizyphus mauritiana).
Natural forests have been demolished to make space for agriculture. Overall, tree cover is good and the trees can be found in linear plantations along roadside/canal side plantations as well as around habitations or farmlands. The common tree species found in the district (either local or exotic) are babul (Acacia nilotica), shisham (Dalbergio sissoo), ber (Zizyphus mauritiana and Zizyphus nummularia), farash (Tamarix aphylla), karir (Capparis aphylla), peelu (Salvadora oleoides), black siris (Albizzia lebbek), white siris (Albizzia procera), neem (Azadirachta indica), jhand (Prosopis cineraria), and sufaida or eucalyptus (Eucalyptus sp.).

The shrubs include mesquite (Prosopis juliflora), prickly sesban (Sesbania bispinosa), aak (Calotropis procera), salt tree (Haloxylon sp.), and camel thorn (Alhagi camalorum). Ground cover is constituted mainly by grasses like Aristida depressa, Eleusine compressa, Panicum antidotale, Saccharum munja, and Typha angustifolia.

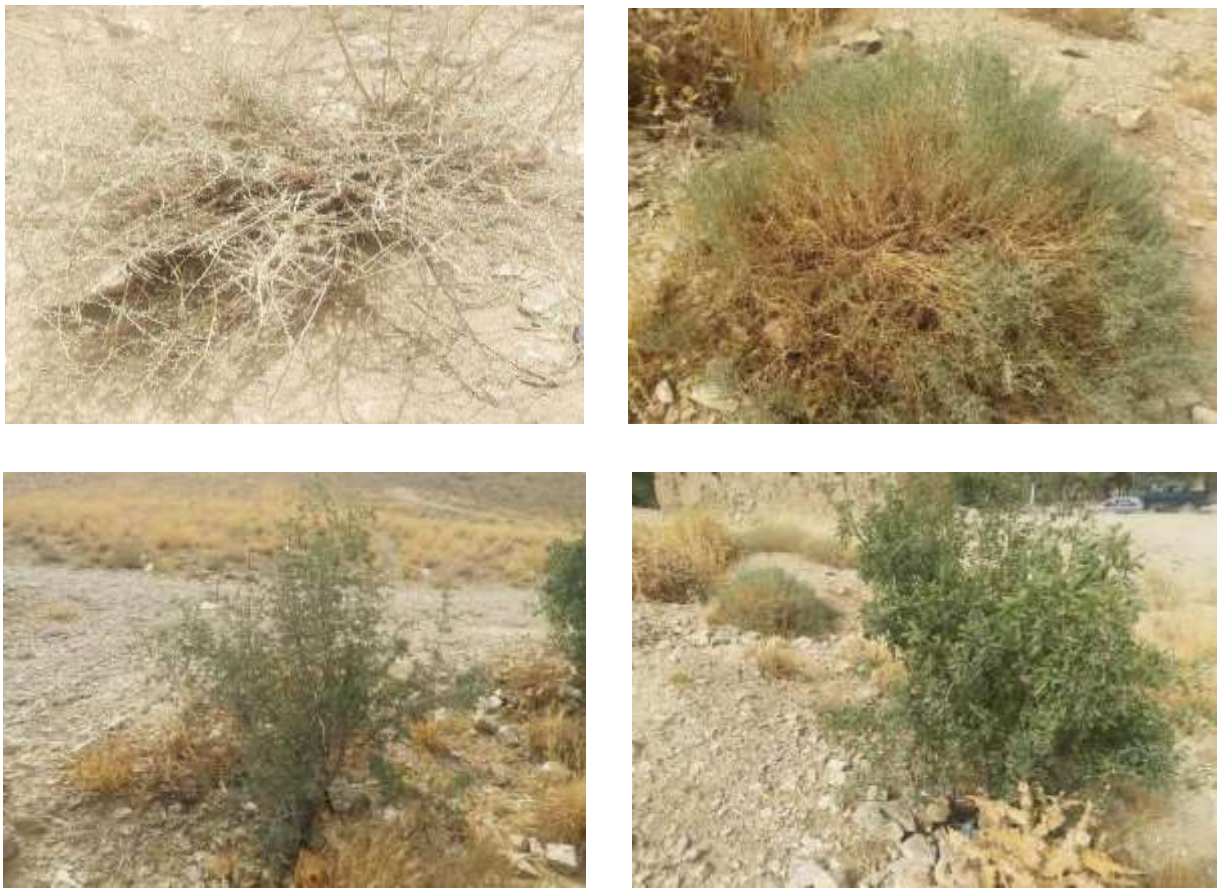

Figure 4-10 Flora in the vicinity of Rabi Canal Area

4.3.2 Fauna

The fauna of the project area predominately belongs to Palearctic zoogeographical region. However, some avian species of oriental region have been noticed here. Table below shows list of birds, mammals and reptiles observed during the site visit in the project area.

Table 4-11: Fauna at Rabi Canal Flood Embankment

Sr. No.	Common Name	Scientific name	IUCN Category
Birds			
1	Black Crowned Finch Lark	*Eremopterix nigriceps*	Least Concern(LC)
2	Black Kite	*Milvus migrans*	Least Concern(LC)
3	Blue Rock Pigeon	*Columba livia*	Least Concern(LC)
4	Cattle Egret	*Bubulcus ibis*	Least Concern(LC)
5	Common Myna/ Indian Myna	*Acridotheres tristis*	Least Concern(LC)
6	Desert Wheatear	*Oenanthe deserti*	Least Concern(LC)
Mammals			
1.	Asiatic Jackal	*Canis aurius*	Least Concern(LC)
2.	Five Stripped Palm Squirrel	*Funambulus pennant*	Least Concern(LC)
3.	Indian Desert Jird	*Meriones hurrionae*	Least Concern(LC)
4.	Indian Gerbil	*Tatera indica*	Least Concern(LC)
5.	Long-eared Hedgehog	*Hemiechinus auritus*	Least Concern(LC)
6.	House Mouse	*Mus musculus*	Least Concern(LC)
Reptiles			
1.	Brilliant Agama	*Trapelus agilis*	Least Concern(LC)
2.	Indian Monitor	*Varanus bengalensis*	Least Concern(LC)

4.3.3 Floods

Severe monsoon rains in District Naseer Abad frequently trigger large-scale flooding, as the area lies within the flood-prone plains of the Kachhi region and is intersected by irrigation canals and distributaries. Heavy downpours combined with weak drainage infrastructure result in the inundation of streets and villages, causing loss of human lives due to electrocution, injuries, and outbreaks of waterborne diseases such as malaria and diarrhea from stagnant water. The floods also lead to indirect losses, including damage to standing crops, disruption of irrigation supplies, and prolonged waterlogging of agricultural land, which severely impacts livelihoods in this agrarian district. Historical flood events, such as the 2022 monsoon disaster, submerged vast tracts of land in Naseer Abad and neighboring districts, displacing thousands of families and destroying critical infrastructure. No activities under this scheme are proposed to control the flood situation in the area.

4.3.4 Protected and Historical Area

There is no wildlife protected areas in the project areas, nor are any of the historical buildings protected.

4.3.5 Trees Loss

In the proposed project areas along the Rabi Canal, some shrubs and bushes fall within the right of way and will require proper clearance before construction begins. Most of the bushes identified during the survey were small Keekars, which grows in the dry period in canal.

4.4 SOCIO-ECONOMIC BASELINE

As part of the Environmental and Social Management Plan (ESMP), a detailed socio-economic baseline assessment was undertaken for the influence area of the Rabi Canal-1. The purpose of this study was to capture prevailing socio-economic conditions and establish a benchmark for evaluating potential project impacts. The baseline covered key aspects such as demographic composition, livelihood strategies, income levels, land utilization, access to essential services, and the status of community infrastructure in settlements surrounding the sub-project site. Particular attention was given to distinguishing vulnerable and non-vulnerable groups, identifying development constraints, and examining community reliance on natural resources especially land and water.

4.4.1 Data Source and Methodology of Baseline Survey

The socio-economic baseline survey for the Rabi Canal -1 was conducted to:

- Assess prevailing demographic, livelihood, and infrastructure conditions in the project area.
- Estimate household income sources, asset ownership, poverty incidence, and vulnerabilities.
- Evaluate access to basic services such as education, health, water, sanitation, communication, and energy.
- Provide a benchmark for measuring future socio-economic impacts of flood protection interventions.

Under this survey, 150 households were interviewed out of a total of 1600 households (total population: 12,500) representing approximately 9.37% of households in the Rabi Canal-1. Interviews were conducted with 90 male and 50 female household members, separately, to ensure gender disaggregated data collection and inclusive representation of community perspectives. Furthermore, above referenced data includes the data of children and disables of the project area so this stands 5 children and 5 disable were interviewed.

4.4.2 Evaluation Approach & Sampling Strategy

We used a before-and-after comparison to track project changes. Data came from household surveys, interviews, and field visits, backed by local secondary sources. Sampling was done in two steps: first, Union Councils in the Rabi canal project area were chosen to reflect the wider community. Then, 150 households were proportionally selected across poor, middle, and better-off groups, ensuring fair representation and reliable results.

4.4.3 Survey Instruments and Data Collection Tools

In line with the World Bank Environmental and Social Framework requirements, various survey instruments were applied to collect primary social baseline These instruments included structured Interview guides were used to conduct key informant interviews, including observation-based interviews with individuals and elders from the local community, to collect local knowledge, perceptions, and site-specific concerns. Additionally, project- approved screening checklists were also used during site visit to collect site specific information.

4.4.4 Short Profile of District Naseer Abbad

Naseer Abad district (part of the Naseer Abad Division in Balochistan) indicates a region that is primarily agricultural, with high poverty rates, low literacy, and significant vulnerability to natural disasters. Based on 2023 census, the population of Naseer Abad district is over 563,315. The population is predominantly rural, with a large portion living outside major urban centres and the district is frequently affected by floods and climate-related hazards, which disrupt livelihoods and strain community resilience. The district headquarter is in “Dera Murad Jamali” town. The district is located in the middle of Balochistan, sharing its boundaries in the east with Dera Bugti and in the west with Jhall Magsi. Jaffar Abad District is in the south and Bolan is in the north. The district is famous for its high yield of wheat.

Table 4-12: Socio-Economic Baseline (2023–2026)

Category	Indicator	Baseline Data / Details
Demographics	Total Population	563,315 (as per 2023 Census)
	Households	87,516
	Growth Rate	3.7% (approx.)
	Urban vs. Rural	Urban: 106,952 (19%) | Rural: 456,363 (81%)
	Sex Ratio	104.54 males per 100 females
Economy	Major Sectors	Agriculture (Rice, Wheat, Onions) and Livestock
	Irrigation Source	Pat Feeder, Kirthar, and Uch Canals
	Livestock Assets	Cattle (165,765 heads), Buffaloes (84,226), Goats (213,294)
	Avg. Income	Historically recorded at PKR 15,470/mo; current estimates range PKR 30k–35k
Education	Literacy Rate (Total)	28.96% (2023 Census data)
	Literacy (Male/Female)	Male: 36.43% | Female: 21.18%
	Key Challenges	High teacher absenteeism, lack of professional qualifications for head teachers
Health	Child Demographics	Children under 5: 95,165 | Under 10: 216,847
	Maternal Health	Women of reproductive age (MWRA): 156,242
	Infant Health	Newborn deaths falling (35 per 1000) | Vaccination coverage Rising
Social & Infrastructure	Poverty Level	Identified as one of the least developed districts (Z-score ranking)
	Utilities	Urban Tap Water: 87% | Rural Tap Water: 0%
	Connectivity	Headquarters: Dera Murad Jamali

4.4.5 Sensitive Receptors

The sensitive receptors within the influence area of the Rabi Canal subproject (RD 0+000 to RD 25+000) include nearby rural settlements and associated community infrastructure such as residential houses, mosques, madrassas, schools, and small commercial units. These receptors were identified using ArcGIS-based mapping and further verified through field surveys.

It has been observed that most of the sensitive receptors are located beyond the immediate Area of Influence (AoI) of 500 m from the canal alignment. As a result, direct impacts are expected to

be minimal and primarily limited to localized construction zones. The spatial distribution of these receptors is illustrated in Figure 4-13, which shows their proximity to the project site.

A limited number of receptors are located within a distance range of approximately 1.0 km to 1.5 km from the canal alignment. These include Mir Hassan village, comprising several settlements and small commercial units, as well as nearby residential structures, agricultural lands, and a petrol pump (Mir Altaf Hussain Khosa Pump). In addition, Lashari Para near an unnamed settlement is located at a distance of about 1.1 km from the canal.

Although these receptors are not located within the immediate construction corridor, they may experience temporary impacts such as dust emissions, noise, and increased movement of construction machinery during the execution phase. However, these impacts will be short-term and localized in nature.

Appropriate environmental management and mitigation measures will be implemented to minimize potential disturbances and ensure the safety and well-being of nearby communities. Overall, no significant adverse impacts on sensitive receptors are anticipated during project implementation.

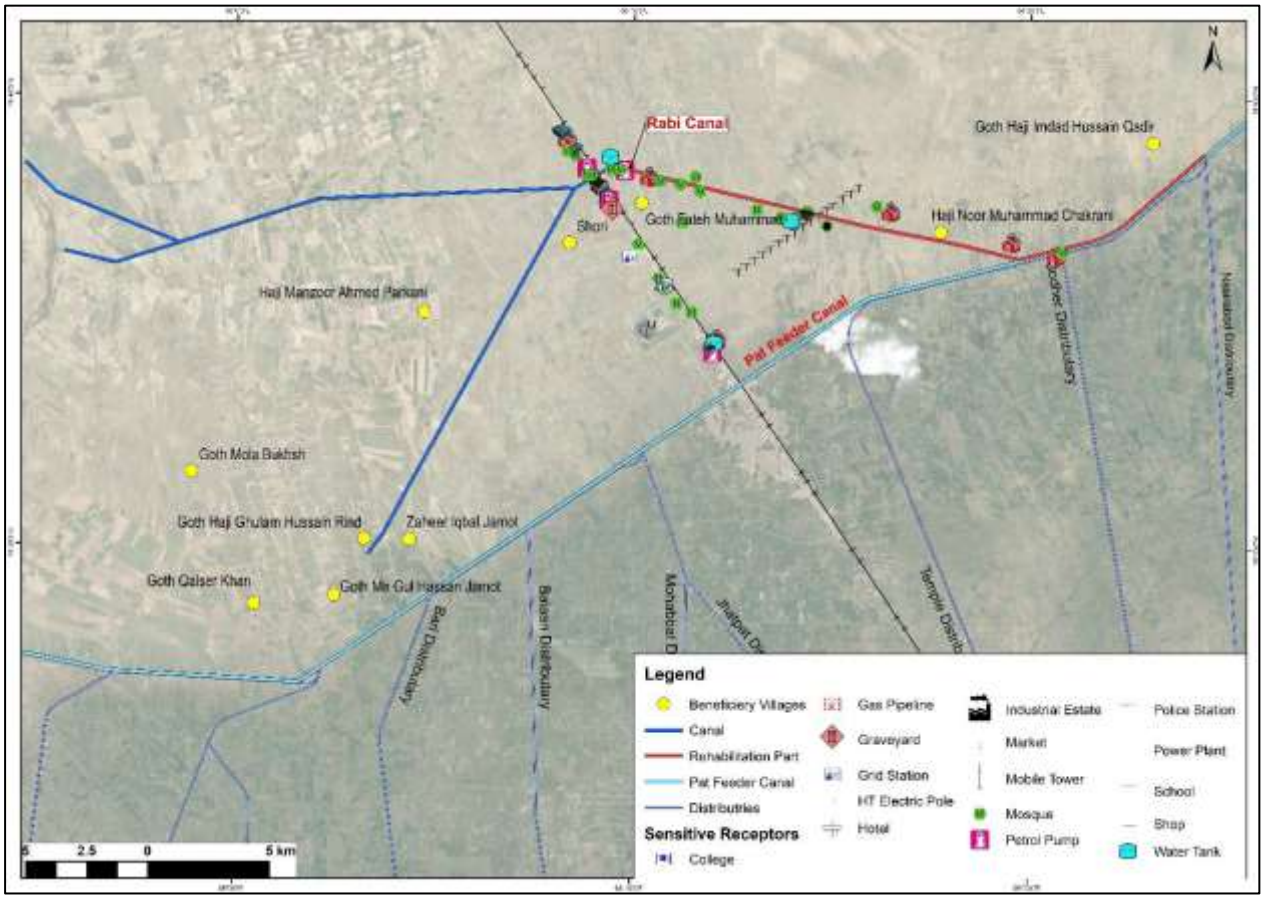

Figure 4-13:Map indicating Social Receptors in the subproject area

These identified sensitive receptors along with their distances from the site has been provided in the Table below.

Table 4-14: Sensitive Receptors of sub-project area

Sr.No	Name of Scheme	Nearby Village	Name of Physical Sensitive receptor
	Restoration and Strengthening of Flood Embankment Main Rabi Canal-1 from RD 0	Mir Hassan	4 villages and one shop (1.5 Km)

Sr.No	Name of Scheme	Nearby Village	Name of Physical Sensitive receptor
1	TO 100000 and Rabi Canal-2 Rd 0 to 22 km District Naseerabad	Mir Hassan	3 houses and farm and one Pump -Mir altaf Hussain khosa Petol pump (1K m)
		Unknown village	Lashari Parak (1.1Km)

4.4.6 Key Social Indicators

This section presents the key social indicators including demographic, education, health, livelihood, housing, and access to services of the project area. The following social indicators were assessed to understand the baseline conditions of the proposed project area under the Rabi Canal. These indicators provide insights into the demographic, educational, health, and livelihood aspects of the local population, highlighting existing challenges and opportunities. The assessment serves as a foundation for evaluating the potential social impacts of the project and for designing interventions that promote equitable development, resilience, and improved living standards for the affected communities.

4.4.7 Language

Balochi and Sindhi are the major languages spoken in the district followed by Brahvi and Sairaki. Urdu is used as a medium of education and as means of communication between people with different ethnic backgrounds. There is also a small number of Pushto speaking population in the district. (Naseer Abad - A District Profile, 2003)

4.4.8 Poverty Levels

Poverty in the region is high, with a significant portion of households living below the national poverty line and the proposed project area faces severe poverty challenges, as reflected in its current baseline indicators. The Multidimensional Poverty Index (MPI) stands at 0.413, highlighting widespread deprivations in health, education, and living standards. More than three-quarters of the population live below the poverty line, with rural communities bearing the greatest burden compared to urban centers such as Dera Murad Jamali. Household surveys reveal that 35.1% of families are classified as poor and an additional 25.1% as very poor, many of them lacking essential assets like electricity and improved sanitation facilities.

Low family income and limited employment opportunities outside subsistence farming and livestock rearing are the primary drivers of poverty, affecting 52% and 38% of households respectively. These economic constraints are compounded by critical infrastructure gaps. Rural areas have no access to tap water, and education remains severely limited, particularly for girls. With only four high schools available for female students across the district, the rate of out-of-school children remains alarmingly high, further entrenching the cycle of poverty.

4.4.9 Household Survey

- Total households in the Rabi Canal area: 1,600
- Total population: 12,500
- Households surveyed: 150
- Individuals interviewed: 150 (90 men and 50 women and 10 vulnerable group)
- Sample represents: 9.37% of male and female household members including vulnerable group.

4.4.10 Education Facilities

The area has limited educational facilities. There is one primary school and one middle school in Mir Hassan Ghot for both boys and girls, and one middle school in Kashk Village serving boys and girls. However, Mir Hassan Ghot-2 does not have any school facility.

Schools in the area face serious infrastructure and staffing issues. In some schools, only one teacher is available to manage all classes. The high school in Mir Hassan Ghot-1 lacks a proper roof, affecting the learning environment. Student enrolment is also very low, with only 17 students currently attending the school.

4.4.11 Health Facilities

Health services in the proposed project areas are very limited. There is one functional Basic Health Unit (BHU) with few basic facilities i.e first aid etc and one dispensary serving three villages: Mir Hassan Ghot-1, Mir Hassan Ghot-2, and Kashak Village. The dispensary facilities operating from private houses, as no purpose-built building structures are available, particularly for the dispensary.

The Mir Hassan dispensary is poorly equipped and provides only basic first-aid services through private arrangements. No proper medical infrastructure, staff, or essential healthcare facilities are available to adequately serve the local population.

For emergencies and advanced medical care, residents must travel to Dera Allah Yar, Naseer Abad District Headquarters, or Karachi.

4.4.12 Water Supply and Sanitation

Only 01 functional village water supply scheme exists in proposed project area for drinking and domestic needs. Communities rely heavily on groundwater, collected from nearby private wells, often using chingchi or livestock for transportation.

4.4.13 Communication and Electricity

Landline telephone service is available, but mobile network coverage is weak. Residents rely on signals from Dera Murad Jamali Tehsil (10 km away). All households are connected to the national electricity grid (K-Electric), but severe load shedding limits availability to approximately 8 hours per day. No natural gas supply is available; residents depend on LPG, gasoline, bushes, and firewood for cooking and heating.

4.4.14 Transport

The area is located 10 km from Dera Allah Yar and 20 km from Naseer Abad City. Common transport modes include minibuses, rickshaws, pickups, and motorbikes. Link roads in the four villages are kacha tracks, poorly maintained.

4.4.15 Social Conflicts

No such incidents or tribal conflicts were identified within the specific sub-project area during consultations and field assessments. Conflict resolution in the area is traditionally managed through tribal or community-led mechanisms, which local residents often consider more effective than formal government channels. Community members confirmed that there are no past or present conflicts associated with the project area.

4.4.16 NGO working in the subproject area

At present, only the IFRAP HRU is actively working within the subproject area. No other national or international non-governmental organizations (NGOs) were identified during the field survey and stakeholder consultations.

4.4.17 Household Information

The socio-economic baseline survey indicates that the proposed sub-project is expected to generate positive impacts for the entire population within the Rabi Canal command area, covering three villages with a total population of 12,500. The details are presented in the table below:

Table 4-15: Number of households and total population

Canals	Village(s)	Households	Population
Rabi canal 1	Killi Hasan Abad 1	600	4,800
Rabi canal 2	Killi Hasan Abad 2	700	5,600
	Kashak Abad	300	2,100
Total		1,600	12,500

4.4.18 Respondent's Relationship with Head of Household

During the survey, 50% of the respondents were heads of households who participated directly in the interviews. Additionally, 10% of respondents were brothers, 25% were sons, and 10% were wives of the household heads. Female-headed households accounted for 5% of the total respondents.

4.4.19 Family Size

The survey data indicates that household sizes vary significantly in the sub-project area. Approximately 10% of households have 1–5 members, 29.2% have 5–10 members, 24.7% have 10–15 members, and 37% of households consist of 15 or more members.

4.4.20 Family System

Approximately 60.3% of the community prefers to live in a joint family system, while 28% favor a nuclear family arrangement. In joint family households, the eldest male typically assumes responsibility for all family members and serves as the primary decision-maker, particularly on matters related to public and community affairs.

The joint family structure also provides a strong social safety net during periods of unemployment or financial hardship, especially for vulnerable groups such as poor women, the elderly, the infirm or ill, and orphans. Communities believe that this system is more economical, as members often work collectively on the same land and pool their incomes to support the entire household, including dependents who are unable to work.

4.4.21 Health Problems

The project area continues to face a high burden of communicable diseases, including malaria, acute respiratory infections, and waterborne illnesses like diarrhea and typhoid, exacerbated by poor sanitation and periodic flooding. The region suffers from severe public health challenges, especially Malnutrition among children and high maternal mortality rates due to limited access to skilled birth attendants. Additionally, emerging health trends show a sharp rise in heart disease cases and seasonal outbreaks of vaccine-preventable diseases like measles in nomadic populations (Naseer Abad Nutrition SMART Survey).

4.4.22 Source of Livelihood and Income

The economy of proposed project area is primarily driven by agriculture and horticulture, livestock rearing and marketing, forestry, industry, and mining, which together constitute the major sources of economic development in the areas. The area lies within the tropical agro-ecological zone, with approximately 64% of its total area having agricultural potential. The district practices two main cropping seasons, Rabi and Kharif.

During the Rabi season, wheat, vegetables, and fodder are the dominant crops. In the Kharif season, paddy rice is the most significant and widespread crop, occupying more than 70% of the total irrigated area, making it the backbone of agricultural production in the area.

Fruit cultivation occupies a very small proportion (0.02%) of the irrigated area. The main fruit crops grown in Naseer Abad include dates, citrus, mangoes, guava, and chikoo.

The baseline survey shows that in the proposed project areas, monthly earnings ranging from PKR 20,000 to PKR 25,000. All households also rely on secondary income sources such as livestock, transportation, small businesses, and salaried employment, generating an additional PKR 17,000 to PKR 20,000 per month.

4.4.23 Agriculture Tools and Farm Machinery

Agriculture in the sub-project area largely depends on rainfall and seasonal floods, which provide water primarily for late Rabi (spring) crops. Due to poverty and local cropping patterns, most farmers lack ownership of key agricultural equipment such as oxen ploughs, tractor ploughs, tractors, trolleys, and threshers. Only 29.5% of farmers own a spray machine. Other essential farm machinery, including tractors for ploughing and threshers, is typically rented as needed.

4.4.24 Commonly Used Agriculture Inputs

The average agricultural expenditure per acre including costs for seed, fertilizers, pesticides, ploughing, and harvesting is approximately PKR 29,900 per crop.

Table 4-16: Estimated Expenses per Year per Acre

Items	Expenses/Acre
Ploughing	6,000
Cotton seeds /bag (10kg)	11,000
Urea DAP	1,750
DAP	4,050
Pesticides/Lit	2,400
Total cost	29,900 PKR

4.4.25 Seasonal Earnings from Crops

During the baseline survey, the following average seasonal earnings in rupees per acre were reported in the sub-project area.

4.4.26 Land Ownership

Land in the Rabi Canal command area is predominantly owned by shareholders based on lineage, with official records maintained by the Revenue Department. The baseline survey revealed that land sales are uncommon in the area. However, when land is sold, the transfer of ownership is conducted formally and documented with the Revenue Department.

4.4.27 Customary Institutions

The tribal system is prevalent in the sub-project area, with the primary tribes being Abro, Salangi, and Manjo.

4.4.28 Vulnerable Groups

The area has two noted vulnerable groups which include Marginalized Smallholders and Wage Laborers and Female-Headed Households. These groups are dependent on agricultural labor and lack the capital to purchase inputs (seeds/fertilizers) to resume farming after disasters, leaving them at extreme risk of food insecurity and over 50 female-headed households in the region as high-priority vulnerable groups requiring targeted housing and livelihood support.

4.4.29 Local Government and Administration

In the sub-project area, the elected members of the provincial and national assemblies are now actively engaged in overseeing and supporting development activities within their constituencies. Previously, local government representatives including Chairmen, Vice-Chairmen, and their Councilors operated under the Balochistan Local Government Act 2013 and were responsible for implementing development projects at the village, union council, and district levels. At the village and union council level, the Union Council Chairmen and Councilors managed local development initiatives, while at the district level, development works were overseen by the District Council led by the Chairman.

Although this formal local government system is no longer in effect, former councilors and chairmen continue to participate in development efforts as political workers, collaborating with provincial and national assembly members to improve infrastructure and services in their areas. The district-level bureaucracy also plays an important role in this process, including the Commissioner, Deputy Commissioner, Additional Deputy Commissioner, Assistant Commissioners, line department officers, and revenue officials, ensuring coordination and support for development activities.

4.4.30 Community Cultural Properties

The following community cultural properties are found in Rabi Canal. These cultural properties do not fall in the channel alignment area or RoW of any of the channel area. The details are illustrated in the following table.

Table 4-17: Community Cultural Properties

Village	Grave Yard	Mosque	In RoW
Rabi Canal	3	05	No

4.4.31 Community Awareness about Sub-Project Works

Communities in the Rabi Canal area are well-informed about the proposed sub-project activities and the planned implementation schedule. This awareness has been fostered through multiple rounds of public consultations conducted by project staff. Additionally, separate consultation meetings for men and women were held in different villages of the Rabi Canal in October 2025 to ensure inclusive community engagement and participation in the project.

4.4.32 Positive Impact of Rabi Canal-1

The Rabi Canal Project commands a vast area under cultivation. By improving water distribution and drainage systems, the project will help secure the productivity of the cultivated land, enabling farmers to benefit from more reliable irrigation and improved crop yields.

In addition, the project provides significant opportunities for the remaining acres of uncultivated land. With enhanced water management and irrigation facilities, this land can gradually be brought under cultivation, contributing to increased agricultural production, improved food security, and enhanced livelihood opportunities for local communities.

During the social survey and community consultations, the Social Team conducted field visits with local community members and landowners. The landowners identified and verified their respective landholdings within the project area, which helped in confirming land ownership and understanding the potential benefits of the project for the affected communities.

In essence, the Rabi Canal Project protects existing farmland while unlocking vast potential for future agricultural growth, making it a cornerstone for sustainable development in the region.

5

STAKEHOLDER CONSULTATIONS

5 STAKEHOLDER CONSULTATIONS

This section presents the process, outcomes, and key findings of stakeholder consultations carried out for the proposed Subproject in accordance with applicable national requirements, the World Bank Environmental and Social Framework (ESF), particularly ESS10 (Stakeholder Engagement and Information Disclosure), and the Project's preliminary Stakeholder Engagement Plan (SEP). The consultations were undertaken during the preparation of the ESMP to inform impact identification, refine mitigation measures, and enhance project acceptability among affected communities and institutions.

5.1 OBJECTIVES OF STAKEHOLDER CONSULTATION

The objective of public consultation is to ensure that the sub-project proponent should share relevant information about the project interventions and the potential environmental and social impacts with all stakeholders. Consultation is a two-way process by which the knowledge and views of affected persons and other interested parties are considered for purposes of decision making. Information dissemination during public consultation by the project proponent or his representative is fundamental to meaningful consultation.

Similarly, efforts are also made to mainstreaming women in all planned project activities as the GAP has also proposed the design and implementation of specialized projects and its interventions strategically to promote active engagement of men and women with the Project.

The stakeholder consultation process was undertaken with the following objectives:

- To disclose relevant information regarding the Subproject scope, activities, and anticipated environmental and social impacts to affected and interested stakeholders in a transparent and timely manner.
- To provide an opportunity for stakeholders, including those who may otherwise be underrepresented, to express their views, concerns, and priorities, thereby enabling informed consideration of mitigation measures and trade-offs.
- To support the identification of potential adverse impacts that may not have been captured through desk-based assessments alone, including local and traditional knowledge.
- To enable stakeholders to positively influence Subproject design and implementation arrangements, within the approved scope of the project.
- To strengthen transparency, accountability, and public confidence in project decision-making.
- To reduce the risk of conflict through early identification of concerns and incorporation of appropriate mitigation and communication measures.
- To foster a sense of ownership of the Subproject among local communities.

5.2 STAKEHOLDER IDENTIFICATION

Stakeholder identification was carried out during the ESMP scoping phase to ensure that all relevant stakeholder groups were appropriately consulted. The primary focus was on communities residing in and around the Subproject area, noting that there is no permanent population within a 500 m right-of-way (RoW) on either side of the proposed works.

Stakeholders were categorized as follows:

5.2.1 Institutional stakeholders

Relevant institutional stakeholders for the Rabi Canal subproject (District Naseerabad) include government departments and local administration at the district and tehsil levels, particularly those associated with irrigation, revenue, agriculture, and local governance.

5.2.2 Non-institutional stakeholders

Residents of nearby settlements, farmers, shopkeepers, local business owners, representatives of schools and basic health facilities, and women and vulnerable groups residing in the surrounding areas.

Targeted consultations with women were conducted in line with the Gender Inclusion Framework, ESS1, ESS2, ESS10, and the SEP. Separate, culturally appropriate meetings were facilitated by female staff in the project areas. A total of fifty women participated. Key concerns raised included household and child safety, access routes, water and sanitation, community infrastructure, construction-related disturbances, livelihood considerations, and timely information sharing. These concerns have been incorporated into the ESMP through gender-responsive mitigation measures, community health and safety provisions, traffic and construction safety controls, and monitoring indicators.

5.3 CONSULTATION PROCESS

Stakeholder consultations were carried out during ESMP preparation through a combination of public meetings, Key Informant Interviews (KIIs), and Focus Group Discussions (FGDs). Consultations were inclusively conducted in local languages and documented to ensure stakeholder views were accurately recorded. The consultation process adhered to national consultation guidelines as well as the requirements of the World Bank ESF and the Project SEP. As ESMP is a live document, the consultations will be conducted throughout the project implementation, resulting in justification of the number of consultations in each sub-project area.

Details of non-institutional consultations conducted along the Subproject area are summarized in Table 5.1. A pictorial record of consultation meetings with community elders and members regarding the Rabi Canal rehabilitation is provided in Annexure-X.

Table 5-1 Details of Non-Institutional Consultations

S.No.	Villages	Number of Respondents	Date of Consultation
Male Consultations Details			
1	Mir Hassan -1	51	04/09/2025
2	Mir Hassan Ghot -1	18	04/09/2025
3	Killi Kashak Abad	21	04/09/2025
	Total	**90**	
Female Consultations Details			
1	Killi Hassan Abad-2	26	05/09/2025
2	Hassan Abad-2	9	05/09/2025
3	Hassan Abad-1	15	06/09/2025
Total		**50**	
Vulnerable Group			
		10	04/09/2025-06/09/2025

5.4 KEY ISSUES RAISED BY NON-INSTITUTIONAL STAKEHOLDERS

During consultations conducted under the project “Restoration and Strengthening of Flood Embankment of Main Rabi Canal, District Naseerabad, Balochistan,” local community members residing along the Rabi Canal highlighted several key environmental and social (E&S) concerns associated with the proposed subproject.

The major issues discussed during public consultations include:

- Employment opportunities for local communities during construction activities;
- Health and safety risks during construction, particularly for women and children;

- Maintaining access to essential services and local mobility during and after construction;
- Potential impacts of project activities on nearby settlements and agricultural lands;
- Provision and access to safe drinking water facilities;
- Concerns related to construction disturbances, including dust, noise, and traffic movement;
- Need for respecting local customs, cultural norms, and community practices;
- Ensuring proper communication and timely information sharing with local communities.

These concerns were carefully considered during the preparation of the Environmental and Social Management Plan (ESMP). Appropriate mitigation measures have been incorporated to address construction-related and environmental risks, including community health and safety provisions, labor management, access planning, environmental controls, and grievance redress mechanisms. While some issues, such as broader social infrastructure improvements, fall outside the direct scope of the project, they have been documented and communicated to relevant authorities for consideration.

5.5 INSTITUTIONAL CONSULTATIONS

Stakeholder engagement is a key component of effective project planning and implementation, ensuring that relevant government institutions and stakeholders remain informed and actively involved throughout the project cycle. In accordance with the World Bank Environmental and Social Framework (ESF), particularly Environmental and Social Standard ESS10 (Stakeholder Engagement and Information Disclosure), meaningful consultations support improved environmental and social performance, strengthen institutional coordination, and facilitate informed decision-making during project implementation.

As part of the stakeholder engagement process for the Rehabilitation of Flood Embankment of Main Rabi Canal Project under the Integrated Flood Resilience and Adaptation Project (IFRAP), institutional consultations were conducted in District Naseerabad and District Jaffarabad by the Social, Environmental, and Technical Teams in coordination with the relevant district administrations and line departments.

The consultation meetings were attended by representatives of key government departments and project stakeholders, including Mr. Ibrahim Ismail (Deputy Commissioner, Naseerabad), Mr. Khalid Khan (Deputy Commissioner, Jaffarabad), Capt. (R) Zulfiqar Ali Qarar (Assistant Commissioner, Naseerabad), Barrister Arsalan Chaudhry (Assistant Commissioner, Jaffarabad), Mr. Ateeq Luni (District Agriculture Officer, Naseerabad), Mr. Zafarullah Khoso (District Agriculture Officer, Jaffarabad), and Mr. Fareed Pandrani (SDO Irrigation). Representatives from the CAMEOS Project, including Mr. Shakoor Kakar and Mr. Naqeeb Ullah Kakar (Social Safeguard Specialists), Ms. Sidra (Gender Specialist), and Mr. Mir Zarak (Junior Environmental Specialist), also participated in the consultations and facilitated stakeholder discussions.

During the meetings, the project team presented a comprehensive overview of the subproject scope, proposed rehabilitation interventions, implementation schedule, and applicable environmental and social safeguard requirements. The Environmental and Social Management Plan (ESMP), occupational health and safety measures, community safety provisions, and grievance redress mechanism were discussed in detail. The Voluntary Land Donation (VLD) process was also explained, and it was clarified that no permanent land acquisition is envisaged under the project.

Key technical and environmental aspects of the rehabilitation works were discussed, including strengthening and rehabilitation of flood embankments, erosion and scour protection measures, slope stabilization, maintenance of hydraulic conveyance capacity, and protection of adjoining agricultural lands and settlements from flood impacts. Discussions also focused on temporary construction-related impacts such as restricted access, dust emissions, noise generation, and community health and safety concerns, along with the proposed mitigation measures to be implemented during construction.

The importance of strengthening the Main Rabi Canal flood embankments to improve flood resilience, minimize breach risks, and protect downstream communities, agricultural lands, and public infrastructure was emphasized during the consultations. Law and order conditions in the project area were also discussed. While no major security concerns were identified, the need for continued coordination with district administration and relevant law enforcement agencies was highlighted to ensure smooth and uninterrupted execution of project activities.

5.6 FUTURE CONSULTATIONS AND DISCLOSURE

Stakeholder engagement will continue throughout Subproject implementation. The draft ESMP will be disclosed to stakeholders prior to finalization to confirm that key concerns and mitigation measures have been adequately incorporated. The final ESMP will be made available at the PMU/PIU offices and shared upon request.

Regular consultations will be conducted before and during construction to keep communities informed of construction schedules, potential disruptions, and safety measures. As part of the Grievance Redress Mechanism (GRM), community meetings will be held periodically to receive feedback and address concerns in a timely and transparent manner. The GRM will provide accessible, time-bound, and culturally appropriate channels for stakeholders to raise environmental and social concerns related to Subproject implementation.

6

IMPACT ASSESSMENT & MITIGATION MEASURES

6 IMPACT ASSESSMENT AND MITIGATION MEASURES

6.1 GENERAL

The implementation and operation of the Rabi Canal subproject (RD 0+000 to RD 25+000) are expected to have impacts on the biophysical and socio-economic environment. These impacts are generally anticipated to be minor, localized, temporary, short-term, and reversible, as the scope of work primarily involves the rehabilitation and re-sectioning of the existing canal system, along with strengthening of the right bank embankment for flood protection.

In addition to potential adverse impacts during the construction phase, the subproject is expected to generate significant positive impacts, including improved hydraulic efficiency, enhanced flood protection, reduced risk of canal breaches, and improved irrigation reliability for the command area.

This section presents the potential environmental and social (E&S) impacts associated with the proposed subproject activities, evaluates their magnitude and significance, and identifies appropriate mitigation measures to minimize adverse effects. It also assesses any residual impacts following the implementation of mitigation measures.

6.2 ASSESSMENT METHODOLOGY

The potential environmental and social impacts of the proposed subproject have been identified based on stakeholder consultations, field observations, applicable technical guidelines, and the professional judgment of the project team. Particular emphasis has been placed on concerns raised by local communities residing along the Rabi Canal alignment.

The existing environmental and social conditions of the subproject area were analyzed and categorized to support impact assessment. A systematic approach was adopted to evaluate the nature, magnitude, duration, and significance of potential impacts during both the construction and operational phases. The step-wise methodology adopted for impact assessment is summarized in Table 6-1.

Table 6-1: Stepwise Methodology for Impact Assessment

Step 1	**Criteria for Determining Significance**	The consequence of the proposed activity is evaluated by comparing it against recognized ‘significance criteria’. The criteria are of the following types:
		Institutional: legislative requirements laid down by the environment for environmental protection including laws, standards, policies.
		Technical: guidelines, available technical or scientific knowledge, or judgment of experts.
		Public: social or cultural values in addition to views of a segment of society, especially the community directly affected by the Project.
Step 2	**Determine the magnitude of potential impacts**	Assessing the scale and describing the anticipated impacts either quantitatively (where possible) or qualitatively or both.
Step 3	**Identify of mitigation measures**	If the predicted impact is of significant nature when compared to the criteria for determining significance, suitable mitigation measures are identified. A range of mitigation measures can be applied to reduce the anticipated impact of a project, and these can be broadly classified into the following categories:

		Avoid the impact altogether by not taking a certain proposed activity or parts of an activity.
		Minimizing impacts by limiting the degree or magnitude of the activity.
		Rectifying the impact by repairing, rehabilitating, or restoring the affected environment and community.
		Compensating for the impact by replacing or providing substitute resources or environments.
Step 4	**Evaluating residual impact**	As the mitigation measures are implemented, the anticipated adverse impacts enter the acceptable limits. This step identifies the remaining impact after incorporation of mitigation measures, if any.
Step 5	**Identify monitoring requirements**	The final step in the impact assessment process is identification of minimum monitoring requirements. The scope and frequency of the monitoring required depends on the residual impact. The purpose of marching is to confirm that the impact is within the predicted limits and to provide timely information if an impact is exceeding acceptable limits.

6.3 SCREENING OF POTENTIAL E&S IMPACTS

The preliminary environmental and social assessment for the Rabi Canal subproject has been carried out using the Rapid Environmental Assessment (REA) Checklist, adapted for canal rehabilitation and flood protection works. The REA serves as a systematic tool for identifying, screening, and categorizing potential environmental and social (E&S) impacts associated with the proposed activities.

Based on this assessment, potential impacts related to the rehabilitation, re-sectioning of the canal, and strengthening of the right bank embankment have been identified across different stages of the subproject. A summary of these impacts, linked with specific subproject activities, is presented in Table 6.2.

Table 6-2: Stepwise Methodology for Impact Assessment

Activities	Impacts
Construction camps, workshops etc.	Waste generation
Leveling/cutting of bushes & earthwork operations	Flora damage, soil erosion, ecosystem deterioration
Excavation operations at burrow & quarry areas	Dust pollution
Construction material, storage and handling	Fumes emissions, chemical infiltrations and slight ground water contamination
Operation of concrete batching plant	Air pollutants emissions, wastewater generation and solid waste generation
Use of bulldozers,	Noise pollution, vibration and dust emission
Use of generators	Particulate matter emission
Heavy equipment/machineries	Lubricants infiltration, noise and vibration.
Movement of vehicles	Dust emission
Generation of Wastewater	Contamination of soil and nearby vegetation, and disturbance of aesthetic
Generation of solid waste	Odor, disturbance of aesthetics

6.3.1 Impact Matrices

The Leopold Matrix (LM) has been adopted as a systematic approach for evaluating the impacts of the proposed development activities on the biophysical and socio-economic environment. The LM provides a structured framework for identifying interactions between project activities and environmental components, along with qualitative assessment and weighting of potential impacts. Although it does not produce a single quantitative score, it facilitates informed decision-making by highlighting the significance and nature of impacts during subproject planning.

In the matrix, the horizontal axis represents project activities and impact characteristics, while the vertical axis represents existing environmental and social (E&S) components that may be affected during subproject implementation. This structure enables a comprehensive evaluation of interactions between the proposed canal rehabilitation works and the surrounding environment.
E&S impacts are assessed by comparing the proposed activities with existing environmental conditions, considering how the subproject will interact with these conditions, and evaluating the effectiveness of mitigation measures in reducing or eliminating adverse effects.
The anticipated impacts are categorized as follows:

Direct Impacts: Direct impacts arise from the immediate interaction of project activities with environmental and social components. For the Rabi Canal subproject, such impacts may include temporary disturbances due to desilting, excavation, re-sectioning of the canal, and strengthening of the right bank embankment, which may affect soil conditions, air quality (dust), and nearby communities during construction.

Indirect Impacts: Indirect impacts are those that occur as a consequence of the project but are not directly linked to construction activities. These may arise through secondary pathways or at locations removed from the project site.

For the Rabi Canal subproject, no significant indirect impacts are anticipated, as the proposed activities are localized in nature and confined within the existing canal alignment. The works are not expected to induce secondary environmental effects beyond the immediate project influence area.

Induced Impacts: The cumulative impacts can be, due to induced actions of projects and activities that may occur if the action under assessment is implemented such as growth inducing impacts and other effects related to induced changes to the pattern of future land use or population density or growth rate. Increase in workforce and nearby communities contributes to this effect.

These groups of impacts can be further divided according to their nature into:

- Positive and negative impact
- Minor, major and moderate impact
- Local and widespread impact
- Temporary and permanent impact
- Short and long-term impact
- Reversible and irreversible impact

During construction and operation phases of Subproject the characterization of potential impact has been classified based on the above characteristics. The characterization of potential E&S impacts is given in Table 6.1 and Table 6.2 for both construction and operation phases.

Furthermore, to indicate the magnitude and frequency of impacts, both E&S impact evaluation matrices have also been formulated for construction and operational phase. The evaluation of E&S impacts during construction and operation phases is shown in Table 6.3 and Table 6.4. Thus, the following scale has been used in evaluation of potential impacts:

Negligible or No Impact: The impact which has obscure and negligible influence on physical, ecological and socio-economic environment

Low Adverse Impact: The impact that has a slight influence on the physical, ecological and socioeconomic environment during construction and operation phases

Medium Adverse Impact: The impact which can be eliminated or mitigated after applying appropriate mitigation measures

High Adverse Impact: The impact which can be partially, but not fully mitigated by applying the mitigation measure

Positive Impact: The impact that enhances natural and socio-economic environment will be positive impact

Identification of a significant E&S indicators/parameters has been carried out based on the existing E&S conditions into the project phases, e.g. design, construction and operation phases.

6.4 CUMULATIVE IMPACTS

In compliance with the requirements of ESS1 of the World Bank's Environmental and Social Framework (ESF), an assessment has been carried out to evaluate the potential for cumulative environmental and social impacts arising from the Rabi Canal subproject (RD 0+000 to RD 25+000) in combination with other existing, ongoing, or reasonably foreseeable developments within its Area of Influence (AoI).

The assessment included consultations with relevant district departments, review of available development plans, and field reconnaissance to identify any parallel or planned infrastructure activities that could interact with the proposed canal rehabilitation, and flood protection works. The review indicates that no major infrastructure, industrial, or large-scale development projects are currently underway or planned within the vicinity that could result in cumulative or synergistic impacts.

The subproject primarily involves the rehabilitation and re-sectioning of the existing canal and strengthening of the right bank embankment, all within an already established and disturbed corridor. Therefore, the anticipated environmental and social impacts are expected to be localized, temporary, and manageable, and can be effectively mitigated through the measures outlined in this ESMP.

The implementation of mitigation and monitoring measures described in Sections 7 and 8 will further minimize any residual impacts during both construction and operational phases. Given the nature, scale, and confined location of the works, and in the absence of significant concurrent developments in the surrounding area, no significant adverse cumulative impacts are anticipated.

Conversely, the subproject is expected to generate positive cumulative impacts, including improved hydraulic efficiency, enhanced flood protection, reduced risk of canal breaches, and increased reliability of irrigation supply. These benefits will contribute to improved agricultural productivity, protection of infrastructure, and enhanced climate resilience and socio-economic conditions within the project area.

Table 6-3: Characterization of E&S Impacts for Construction Phase

Environmental Component	Impact Characteristics														
	Direction		Duration		Location		Frequency		Extent		Significance			Reversibility	
	Positive	Negative	Long	Short	Direct	Indirect	Cont.	Intermittent	Wide	Local	High	Moderate	Low	Reversible	Irreversible
Topography	☆		☆			●		●		●	☆			●	
Surface water quality	☆		☆		●			●		●		●		●	
Ground water quality	☆		☆		●			●		●		●		●	
Ambient air quality		●		●	●			●		●		●		●	
Noise level		●		●	●			●		●		●		●	
Soil quality	●			●	●			●		●		●		●	
Solid waste		●		●	●			●		●		●		●	
Construction Camps		●		●	●			●		●		●		●	
Flora:															
Shrubs		●		●	●			●		●			●	●	
Trees		●				●		●		●		●		●	
Fauna:															
Mammals		●		●		●		●		●		●		●	
Birds		●		●	●			●		●		●		●	
Health and safety	☆			●	●			●		●		●		●	
Community health and safety	☆			●	●			●		●			●	●	
Economic activity	☆		☆		●		●	●	●	●	●				
Legend: **Negative Impact (●) Positive Impact (☆)**															

Table 6-4: Characterization of Potential E&S Impacts for Operation Phase

Environmental Component	Impact Characteristics														
	Direction		Duration		Location		Frequency		Extent		Significance			Reversibility	
	Positive	Negative	Long	Short	Direct	Indirect	Cont.	Intermittent	Wide	Local	Large	Moderate	Small	Reversible	Irreversible
Air quality	☆		☆		☆		☆			☆	☆			☆	
Water quality	☆		☆		☆		☆			☆	☆			☆	
Noise level	☆		☆		☆		☆			☆	☆			☆	
Road safety	☆		☆		☆		☆			☆	☆			☆	
Landscaping	☆		☆		☆		☆			☆		☆		☆	
Community development	☆		☆		☆		☆			☆		☆		☆	
Traffic condition	☆		☆												
Lifestyle of people	☆		☆		☆		☆			☆		☆		☆	
Flora:															
Shrubs	☆		☆		☆		☆			☆		☆		☆	
Trees	☆		☆		☆		☆			☆		☆		☆	
Fauna:															
Mammals	☆		☆		☆		☆			☆		☆		☆	
Birds	☆		☆		☆		☆			☆		☆		☆	
Legend: **Negative Impact (●) Positive Impact (☆)**															

Table 6-5: E&S Impacts Evaluation during Construction Phase

Sr. No.		Physical Environment								Ecological Environment		Socio economic Environment					
	Environmental Component / Project Activities	Topography	Soil quality	Landscape	Surface Water quality	Groundwater quality	Slope stability	Air quality	Noise & vibration	Flora	Fauna	Social disturbance	Disruption of Public utilities	Employment	Traffic issues	Economic activity	Health and safety
1	Construction camps, workshops etc.	LA	0	0	LA	MB	LA	LA	LA	LA	LA	LA	0	0	LA	0	LA
2	Levelling/tree cutting	LA	LA	0	LA	LA	LA	LA	LA	LA	LA	0	0	0	LA	0	LA
3	Excavation operations	LA	LA	LA	LA	0	LA	LA	LA	LA	LA	LA	0	0	LA	0	LA
4	Construction material, storage and handling	0	LA	0	0	LA	0	0	0	0	0	0	0	0	LA	0	LA
5	Open storage of construction materials, fuel etc.	0	LA	0	0	LA	0	LA	0	0	0	0	0	0	LA	0	LA
6	Solid waste generation and handling	LA	LA	LA	LA	LA	0	LA	0	LA	LA	LA	0	0	0	0	LA

7	Use of Chemicals	0	0	0	LA	LA	LA	LA	0	LA	LA	LA	0	0	0	0	0
8	Earthwork operations	LA	LA	LA	LA	0	0	LA	LA	LA	LA	LA	0	0	LA	0	LA
9	Operation of concrete batching plant	LA	LA	LA	LA	0	LA	0	LA	0	0	LA	0	0	0	0	LA
10	Use of generators	LA	LA	0	LA	0	LA	LA	MA	0	LA	LA	0	0	0	0	LA
11	Heavy equipment/machineries	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA	0	0	0	0	LA
12	Plantation along RoW	LB	MB	MB	0	0	MB	MB	MB	MB	MB	0	0	0	0	0	0

Legend:
O = No impact LA = Low Adverse MA = Medium Adverse HA = High Adverse MB = Medium Beneficial HB = High Beneficial LB = Low Beneficial NA=Not Applicable

Table 6-6: E&S Impacts Evaluation during Operation Phase

Sr. No.	Environmental Components / Project Activities	Physical Environment								Ecological Environment		Socio Economic Environment					
		Topography	Soil quality	Landscape	Surface water quality	Groundwater quality	Slope stability	Air quality	Noise & vibration	Flora	Fauna	Land use	Population disturbance	Employment	Communication system	Public safety	Economic activity
1	Movement of vehicles	0	0	0	MB	MB	MB	HB	HB	0	0	0	0	MB	HB	HB	MB
2	Stormwater	0	LA	0	LA	LA	LA	LA	LA	LA	LA	LA	LA	0	LA	0	0
3	Solid waste	0	LA	LA	LA	LA	0	LA	0	LA	LA	LA	LA	0	0	LA	0
4	Traffic control	0	0	0	0	0	0	HB	HB	0	0	0	0	0	0	HB	MB
5	Maintenance of infrastructure	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA	0	LA	0	LA	LA	0
7	Maintenance of road	0	LA	0	0	0	0	LA	LA	MB	0	0	0	0	0	0	0
8	Road accidents	0	0	0	0	0	0	0	0	0	0	NA	NA	NA	LA	MA	NA
9	Maintenance of flora species	0	MB	MB	0	0	0	HB	0	MB	0	0	0	0	0	NA	0
10	Conservation of faunal species	0	0	0	0	0	0	0	0	HB	HB	0	0	0	0	0	0

Legend:
O =No impact NA=Not Applicable LA = Low Adverse MA = Medium Adverse LB = Low Beneficial MB = Medium Beneficial HB = High Beneficial HA = High Adverse

6.5 ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

This chapter presents a comprehensive assessment of the Environmental and Social Risks and impacts associated with the Sub-project during the design, construction, and operation phases. The assessment follows a risk-based approach consistent with the World Bank Environmental and Social Framework (ESF) and applicable national regulations.

Environmental and social aspects are addressed under separate sections, and each impact category is discussed under a standalone heading, followed by clearly defined impacts and detailed mitigation measures. All mitigation measures are designed to be implementable, enforceable, and monitorable, similar in rigor to the Traffic and Construction Safety Management framework.

6.5.1 Environmental Impacts

6.5.1.1 Topography and Soil Stability

The subproject involves the rehabilitation and re-sectioning of the Rabi Canal (RD 0+000 to RD 25+000), including desilting, reshaping of the canal prism, and strengthening of the right bank embankment as a flood protection bund. These activities may result in localized changes to landform and soil characteristics within the project footprint.

Impacts / Risks

- **Design Phase**
  - Modification of existing canal cross-sections due to re-sectioning and restoration of the regime section.
  - o Potential erosion risks if side slopes and embankment design are not adequately defined.
- **Construction Phase**
  - Soil erosion and sediment movement due to desilting and excavation activities.
  - Embankment instability or localized failure due to improper excavation or slope formation.
  - Soil contamination from fuel, oil, and lubricant spills.
  - Land degradation or water ponding due to improper disposal of excavated material or inadequate site restoration.
- **Operation Phase**
  - No significant long-term impacts anticipated if construction is properly managed.

Mitigation Measures

Topography and soil-related risks shall be managed through optimized design and controlled construction practices, implemented by the Contractor and supervised by the Engineer.

Design Phase

▪ Optimization of Canal Re-sectioning and Alignment

The canal section shall be restored to a stable and hydraulically efficient trapezoidal profile while minimizing unnecessary excavation and disturbance.

- **Stable Side Slope and Embankment Design**

Side slopes (2H:1V) and embankment geometry shall be designed based on soil conditions. The right bank embankment shall be strengthened and raised to function as a flood protection bund.

- **Provision of Adequate Hydraulic Capacity**

The canal shall be designed to safely convey flows without causing erosion, overtopping, or instability of the embankments.

Construction Phase

- **Phased Desilting and Excavation**
  - Desilting and excavation works shall be carried out in a phased and controlled manner, limiting the extent of exposed soil surfaces at any given time.

- **Stabilization of Canal Slopes and Embankments**
  - All exposed soil surfaces shall be stabilized promptly through compaction, temporary coverings, mulching, or other suitable protective measures. Temporary stabilization shall remain in place until permanent erosion protection works are completed.

Management of Fuel, Oil, and Lubricants

- Designated areas for fuel storage, refueling, and equipment maintenance shall be established away from watercourses and sensitive land uses. These areas shall be provided with impervious flooring, drip trays, and spill kits. Site personnel shall be trained in spill prevention and response, and any accidental spills shall be cleaned immediately and disposed of in accordance with approved procedures.

Borrow Material Sourcing and Rehabilitation

- Borrow material shall be sourced only from approved and authorized locations. Upon completion of use, borrow pits shall be rehabilitated through re-grading, drainage provision, and restoration to prevent land degradation, water ponding, and vector breeding. Where feasible, rehabilitated areas shall be returned to stable or productive land use.

Avoidance of Productive Agricultural Land

- Construction activities shall avoid productive agricultural land and adjacent areas to the maximum extent practicable. Where temporary disturbance is unavoidable, affected areas shall be restored to pre-construction conditions, including replacement of topsoil, re-grading, and drainage restoration.

Operation Phase

- No significant long-term impacts on topography or soil characteristics are anticipated during the operation phase, if construction is carried out in accordance with approved designs and embankments and drainage systems are regularly inspected and maintained.

6.5.1.2 Climate Change and Climate Resilience

Pakistan is highly vulnerable to climate change, particularly due to increasing rainfall intensity and flood events. The Rabi Canal subproject is designed as a climate adaptation intervention to improve hydraulic efficiency and enhance flood protection along the canal.

Impacts / Risks

- **Design Phase**
  - Reduced effectiveness of drainage systems if future climate extremes are not considered..

- **Construction and Operation Phases**

- No direct climate-induced impacts beyond those addressed through design.

Mitigation Measures

Climate resilience shall be systematically embedded into the project design, led by the Design Consultants and verified by the Employer/Client, to ensure long-term effectiveness of drainage systems under changing climate conditions.

The climate resilience of the Flood Embankment along the Main Rabi Canal has been substantially strengthened to address the escalating flood risks associated with projected climate change scenarios. The existing infrastructure, which was originally designed using historical hydrological return period data, demonstrated susceptibility to extreme flood events, particularly during the 2022 floods that resulted in significant damage to the Main Rabi Canal system. Updated hydrological assessments conducted under the SSP2-4.5 climate scenario project considerable increases in peak flood inflows at both locations. Specifically, the 50-year return period discharge is projected to increase from 1,257 cusecs under historical conditions to 2,049 cusecs, while the 100-year return period discharge is projected to rise from 1,533 cusecs to 2,484 cusecs.

In response, the IFRAP subprojects have been re-engineered using climate-adaptive design criteria. The revised design framework adopts the SSP2-4.5 projected 50-year return period flood as the primary design benchmark, supplemented by stability and safety verification against the 100-year return period flood to ensure resilience under extreme hydrological conditions. The upgraded designs incorporate enhanced hydraulic conveyance capacity, reinforced embankment structures, improved slope stabilization measures, and advanced erosion protection systems. These interventions significantly improve the structural reliability, durability, and adaptive capacity of the embankments, thereby ensuring greater resilience to future high-intensity flood events while accommodating uncertainties associated with long-term climate change projections.

Design Phase

- **Design for Extreme Flow Conditions**

The canal section and embankment shall be designed considering extreme flood events and projected climate variability.

- **Strengthening of Right Bank Embankment**

The right bank shall be raised and strengthened to act as a flood protection bund, preventing overtopping and breach during high flood conditions.

- **Climate-Informed Hydraulic Design**

Hydraulic parameters shall be reviewed based on recent flood events and available climate projections to ensure adequate capacity and resilience.

- **Assessment of Future Scenario**

Where feasible, sensitivity analysis shall be considered to evaluate canal performance under varying climatic conditions.

Construction and Operation Phases

No additional climate-induced risks are anticipated during construction and operation beyond those addressed through climate-informed design measures, provided that structures are constructed in accordance with approved designs and maintained appropriately.

6.5.1.3 Ambient Air Quality

Construction activities may temporarily affect air quality due to dust generation and exhaust emissions, potentially impacting workers and nearby communities.

Impacts / Risks

- **Construction Phase**
  - Fugitive dust from excavation, hauling, and stockpiles.
  - Exhaust emissions from construction machinery, generators, and vehicles.
- **Operation Phase**
  - Minor increase in vehicular emissions along the improved corridor.

Mitigation Measures

Air quality impacts arising from construction and operation activities shall be managed through a combination of engineering controls, good construction practices, and routine monitoring, implemented by the Contractor and supervised by the Engineer.

Construction Phase

- **Regular Water Sprinkling**

The Contractor shall implement regular water sprinkling on exposed surfaces, haul roads, access routes, stockpiles, and excavation areas, particularly during dry and windy conditions. The frequency of sprinkling shall be adjusted based on site conditions to effectively suppress fugitive dust without causing waterlogging.

- **Covering of Construction Materials during Transportation**

All fine construction materials, including soil, sand, aggregates, and debris, shall be covered during transportation using tarpaulins or equivalent methods to prevent dust dispersion along haul routes and nearby settlements.

- **Maintenance of Machinery and Vehicles**

Construction machinery, generators, and vehicles shall be properly maintained and regularly tuned in accordance with manufacturer specifications to minimize exhaust emissions. Equipment emitting excessive smoke or noise shall be removed from service until repaired.

- **Respiratory Protection for Workers**

Workers exposed to dusty conditions shall be provided with appropriate respiratory protection, such as dust masks or respirators, depending on exposure levels. Workers shall be trained in the correct use and maintenance of respiratory protective equipment.

- **Prohibition of Open Burning**

Open burning of construction debris, excavated material, or camp waste shall be strictly prohibited. All waste shall be collected, stored, and disposed of through approved disposal methods in accordance with applicable environmental regulations.

Operation Phase

- **Roadside Plantation with Locally Suitable Species**

Roadside plantation shall be undertaken using locally suitable and native species to act as a natural dust barrier, improve microclimate, and enhance visual aesthetics. Plantation areas shall be maintained until vegetation is established.

- **Maintenance of Paved Surfaces**

Paved and improved surfaces shall be maintained in good condition to minimize dust generation during operation. Any damaged sections shall be repaired promptly to prevent surface degradation and dust emissions.

- **Enforcement of Vehicle Emission Standards**

Applicable vehicle emission standards shall be enforced during operation through coordination with relevant authorities. Regular inspection and maintenance of project-related vehicles shall be encouraged to minimize exhaust emissions.

Monitoring and Supervision

Air quality mitigation measures shall be monitored regularly by the Contractor and supervising Engineer. Visual inspections shall be carried out to assess dust levels, and corrective actions shall be implemented promptly where excessive emissions are observed.

6.5.1.4 Noise and Vibration

Noise and vibration generated by construction machinery may cause temporary disturbance to nearby settlements and sensitive receptors.

Impacts / Risks

- **Construction Phase**
  - Elevated noise levels from heavy machinery, generators, and transport vehicles.
  - Disturbance to schools, mosques, and residential areas.
- **Operation Phase**
  - Reduced noise levels due to smoother road surface and improved alignment.

Mitigation Measures

Noise and vibration impacts arising from construction activities shall be managed through appropriate equipment selection, controlled work scheduling, worker protection, and monitoring, implemented by the Contractor and supervised by the Engineer.

Construction Phase

▪ Use of Modern Equipment with Noise Control Features

The Contractor shall use modern, well-maintained construction machinery fitted with effective silencers, mufflers, and noise-dampening devices. Equipment generating excessive noise due to poor maintenance or defects shall be repaired or replaced promptly.

▪ Scheduling of High-Noise Activities

High-noise construction activities shall be restricted to daytime working hours and scheduled to avoid sensitive periods, including school hours, prayer times, and community events, to the extent practicable. Advance notice shall be provided to nearby communities when noisy activities are unavoidable.

▪ Prohibition of Pressure Horns near Sensitive Receptors

The use of pressure horns and unnecessary vehicle honking shall be strictly prohibited near settlements, schools, mosques, and other sensitive receptors. Appropriate signage shall be installed, and drivers shall be instructed accordingly.

▪ Provision of Hearing Protection to Workers

Workers exposed to high noise levels shall be provided with appropriate hearing protection, such as earplugs or earmuffs. Workers shall be trained in the correct use of hearing protection, and exposure durations shall be managed where necessary.

▪ Periodic Noise Monitoring

The Contractor shall conduct periodic noise monitoring at representative locations, particularly near sensitive receptors, to verify compliance with applicable national and international noise standards. Monitoring results shall be recorded and corrective actions taken if exceedances are identified.

Operation Phase

Noise levels during the operation phase are expected to be lower than during construction, due to smoother road surfaces and improved alignment. No additional mitigation measures are anticipated beyond routine maintenance.

6.5.1.5 Surface and Groundwater Quality

Surface water bodies and groundwater may be affected if fuels, chemicals, wastewater, or construction debris are not properly managed.

Impacts / Risks

Construction Phase

- Contamination from fuel, oil, lubricants, and sanitary wastewater.
- Pollution of irrigation channels and drains.

Operation Phase

- No significant impacts anticipated.

Mitigation Measures

- Protection of surface water bodies and groundwater resources shall be ensured through preventive, containment, and good housekeeping measures, implemented by the Contractor under the supervision of the Engineer.

Construction Phase

▪ **Installation of Septic Tanks and Settling Ponds**

- Construction camps shall be equipped with properly designed septic tanks and settling ponds to manage sanitary wastewater and runoff from washing areas. These facilities shall be sized appropriately for the workforce, regularly maintained, and dislodged as required to prevent leakage, overflow, or contamination of surrounding soil and water bodies.

▪ **Prohibition of Vehicle and Machinery Washing near Water Bodies**

- Washing of vehicles, machinery, and equipment near rivers, canals, drains, or other water bodies shall be strictly prohibited. Designated washing areas shall be established away from water sources, provided with oil-water separators or sediment traps where necessary to prevent discharge of contaminants.

▪ **Location of Camps, Workshops, and Fuel Storage Areas**

- Construction camps, workshops, fuel storage, and refueling areas shall be located at least 1 km away from surface water bodies and groundwater abstraction points, where practicable. These areas shall be provided with impervious surfaces, drainage controls, and spill containment measures to minimize the risk of contamination.

▪ **Prevention of Construction Debris Entering Waterways**

- The Contractor shall implement measures to prevent construction debris, excavated material, and waste from entering irrigation channels, drains, or natural watercourses. Temporary barriers, silt fences, and proper waste storage shall be used as required. Regular site housekeeping shall be maintained to keep waterways free of debris.

Operation Phase

- No significant impacts on surface water or groundwater quality are anticipated during the operation phase, provided that construction-phase mitigation measures are properly implemented and sites are restored following completion of works.

6.5.1.6 Waste Management

Construction activities will generate solid, hazardous, and oily waste requiring proper handling and disposal, waste management plan is provided as Annexure-S for reference.

Impacts / Risks

Construction Phase

- Soil and water contamination due to improper waste handling.

Operation Phase

- Minimal non-hazardous waste generation.

Mitigation Measures

- Solid, hazardous, and oily wastes generated during construction shall be managed through a structured waste management system, implemented by the Contractor under the supervision of the Engineer, to prevent contamination of soil, water, and the surrounding environment. (Annexure-S)

Construction Phase

▪ **Segregation of Hazardous and Non-Hazardous Waste at Source**

- All wastes shall be segregated at source into hazardous and non-hazardous categories. Clearly labelled containers shall be provided at construction sites and camps to ensure proper separation, storage, and handling of different waste streams.

▪ **Disposal at Approved Sites**

- Waste shall be disposed of only at sites approved by relevant local authorities. Disposal records shall be maintained to document quantities, types of waste, and disposal locations. Unauthorized dumping or burning of waste shall be strictly prohibited.

▪ **Management and Disposal of Used Oil**

- Used oil, lubricants, and oily waste shall be collected in sealed, leak-proof containers and stored in designated areas with secondary containment. Disposal shall be carried out through licensed recyclers or authorized waste handlers, in accordance with applicable regulations.

▪ **Spill Response Materials and Procedures**

- Fuel storage and handling areas shall be equipped with spill response materials, including absorbents, sand, and containment booms. Clear procedures shall be established for spill prevention, containment, and cleanup. Personnel shall be trained in spill response, and any spills shall be addressed immediately.

▪ **Reuse of Scarified or Milled Bituminous Material**

- Where feasible, scarified or milled bituminous material shall be reused in construction works, such as sub-base or shoulder layers, to reduce waste generation and demand for new materials. Reuse shall comply with applicable technical specifications and quality standards.

Operation Phase

- During the operation phase, only minimal quantities of non-hazardous waste are anticipated. Such waste shall be managed through routine collection and disposal in accordance with local waste management practices.

Sediment Testing and Management Protocol

Prior to any de-silting or excavation activities, the Contractor shall implement the following mandatory sediment testing and management protocol:

1. Sample Collection

The Contractor shall collect a minimum of three (3) representative sediment samples from the accumulated silt deposits along the 25 km reach of the Rabi Canal. Samples shall be collected from locations evenly distributed along the drain alignment, with additional samples taken at any point where visual inspection indicates potential contamination (e.g., discoloration, odor, proximity to discharge points). Each sample shall weigh a minimum of 2 kg and be collected, preserved, and transported in accordance with internationally recognized sampling standards.

2. Laboratory Accreditation

All sediment sampling and testing shall be carried out by a laboratory accredited to **ISO/IEC 17025:2017** (General Requirements for the Competence of Testing and Calibration Laboratories) or an equivalent internationally recognized accreditation. The Contractor shall submit the laboratory's accreditation certificate and scope of testing to the Construction Supervision Consultant (CSC) for review and approval prior to sample collection.

3. Testing Parameters

Sediment samples shall be tested for the following parameters:

Parameter Category	Specific Parameters	Analytical Method Reference
Heavy Metals	Arsenic (As), Lead (Pb), Cadmium (Cd), Chromium (Cr), Mercury (Hg), Nickel (Ni), Copper (Cu), Zinc (Zn)	APHA 3120 / EPA 200.7 / 200.8
Organochlorine Pesticides	DDT, DDE, DDD, Aldrin, Dieldrin, Endrin, Heptachlor, Lindane (gamma-BHC)	EPA 8081B / 8270E

The laboratory may propose equivalent internationally recognized analytical methods, subject to prior approval by the CSC.

4. Applicable Standards for Compliance Assessment

Test results shall be compared against the following standards:

- For disposal as inert / non-hazardous waste or beneficial reuse (e.g., embankment fill): The concentration of each tested heavy metal and pesticide shall not exceed the limits specified in Pakistan NEQS for Municipal Solid Waste (MSW) Disposal Guidelines or, in the absence of specific NEQS for sediment, US EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil. The CSC shall approve the applicable benchmark standard prior to testing.
- For classification as hazardous waste**:** If any parameter exceeds the applicable standard above, the sediment shall be classified as hazardous.

5. Decision Matrix and Disposal Protocol

Test Result	Classification	Disposal / Reuse Method	Documentation

			Required
All parameters below applicable standard	Non-hazardous / Inert	May be reused for embankment fill, berm formation, or disposed of at a licensed inert waste disposal site.	Lab report, CSC approval, waste manifest (if disposed).
Any parameter exceeds applicable standard	Hazardous Waste	Shall NOT be reused. Shall be transported by a licensed hazardous waste carrier and disposed of at a facility authorized to receive hazardous waste (e.g., incineration or secured landfill).	Lab report, hazardous waste manifest, certificate of disposal from receiving facility.

6. Record Keeping and Reporting

The Contractor shall submit the following to the CSC prior to commencing any de-silting or excavation:

- Sampling and testing plan, including proposed sampling locations.
- Laboratory test reports for all three (3) samples.

All laboratory reports, waste manifests, and disposal certificates shall be retained by the Contractor and made available for inspection by the PIU. A summary of sediment testing results and disposal quantities shall be included in each monthly ESMP compliance report.

7. Contingency for Unexpected Contamination

If testing identifies hazardous contamination, the Contractor shall immediately notify the CSC and PIU. De-silting in the affected reach shall be suspended until a site-specific hazardous waste management plan is approved by the CSC. All additional costs associated with hazardous waste handling and disposal shall be borne by the Contractor.

6.5.1.7 Vegetation and Tree Removal

The project corridor includes agricultural land with scattered vegetation; no protected areas are present.

Impacts / Risks

Construction Phase

- Limited vegetation removal for camps and access routes.
- Dust deposition on crops and trees.

Operation Phase

- No adverse ecological impacts anticipated.

Mitigation Measures

Impacts on vegetation shall be minimized through controlled and limited site clearance, protection of adjoining agricultural areas, and implementation of compensatory plantation measures. All such activities shall be undertaken by the Contractor under the supervision of the Engineer in compliance with the approved environmental management requirements.

Compensatory plantation shall be carried out at a minimum replacement ratio of 1:5, or higher where required under applicable regulatory provisions and World Bank guidelines. Preference shall be given to indigenous, climate-resilient, and site-compatible species possessing higher ecological value and survival rates. Plantation activities shall, where feasible, be undertaken along the bund alignment, downstream reaches, and other designated community or government lands

in coordination with local communities and the Forest Department, Government of Balochistan. The detailed plantation plan is provided in Annexure-V.

Construction Phase

▪ **Limitation of Vegetation Clearance to Required Areas**

Vegetation clearance shall be strictly limited to areas essential for construction activities such as camps, access routes, and work fronts. Clearing beyond the approved project footprint shall not be permitted. Trees and vegetation outside the construction boundary shall be clearly marked and protected to prevent accidental damage.

▪ **Dust Suppression near Agricultural Fields**

Dust suppression measures, including regular water sprinkling, shall be applied near agricultural fields, orchards, and roadside vegetation to minimize dust deposition on crops and trees. The frequency of dust control measures shall be increased during dry and windy conditions.

▪ **Protection of Crops from Construction Activities**

The Contractor shall take necessary measures to protect standing crops and vegetation adjacent to construction areas. These measures may include temporary fencing, controlled movement of machinery, and clearly defined access routes to prevent encroachment onto cultivated land. Any accidental damage to crops shall be reported and addressed in accordance with applicable procedures.

▪ **Compensatory Plantation**

Compensatory plantation shall be undertaken to offset unavoidable vegetation loss, in consultation with local communities and relevant authorities. Plantation shall use locally suitable and native species, and locations shall be selected to enhance environmental and social benefits. Planted saplings shall be maintained until establishment to ensure survival.

Operation Phase

No adverse ecological impacts are anticipated during the operation phase, provided that construction-phase mitigation measures are effectively implemented, and plantation areas are properly maintained.

6.5.1.8 Hydrological Risks during Construction

The proposed construction activities along the Main Rabi Canal (RD 0+000 to RD 25+000) will involve de-silting, re-sectioning, and strengthening of the right bank embankment. These activities will temporarily alter the hydraulic characteristics of the canal and may expose incomplete works to flood risks.

Impacts / Risks – Construction Phase

- **Flooding of partially constructed embankment:** Unseasonal or early monsoon rainfall may cause flash flooding in the canal, overtopping incomplete sections and causing erosion, structural damage, and worker safety risks.
- **Scour at pipe inlet/outlet structures:** Installation of eight (08) new pipe inlets (0.60 m diameter) requires excavation and placement of headwalls and aprons. If flows increase during installation, scouring may undermine these structures.
- **Sediment release during de-silting:** Removal of accumulated silt and deposits may release sediment downstream, affecting water quality in irrigation channels and agricultural fields.
- **Embankment instability during rain:** Exposed earth embankments under construction may become unstable if saturated by heavy rainfall, leading to slope failure or localized breaches.

Mitigation Measures - Design and Construction Phase

Design Phase:

- **Climate-informed hydraulic design:** The revised design incorporates the SSP2-4.5 projected 50-year return period flood (2,049 cusecs) as the primary design benchmark, with stability verification against the 100-year return period flood (2,484 cusecs). Adequate freeboard (minimum 0.5 m above design flood level) shall be provided.

Construction Phase:

- **Phased construction and priority strengthening:** Construction shall be phased such that critical reaches are strengthened first. De-silting and excavation shall not proceed on more than 2 km at any given time to limit exposure.
- **Real-time weather checks:** The Contractor shall regularly check a real-time weather situation, including coordination with the Pakistan Meteorological Department (PMD) and local flood forecasting authorities. Rainfall thresholds for work suspension shall be defined (e.g., 25 mm in 24 hours).
- **Flood response and evacuation plan:** An Emergency Preparedness and Response Plan (EPRP) shall include specific flood response procedures, including a pre-defined flood trigger level (e.g., water level in canal rising 0.3 m above dry season flow), an evacuation route, and muster points for workers and equipment. Drills shall be conducted quarterly.
- **Temporary erosion and sediment control:** Silt curtains or temporary settling basins shall be installed 500 m downstream of active de-silting zones. Turbidity shall be monitored daily at two locations (upstream and 500 m downstream) during active works. If turbidity exceeds 50 NTU above baseline, work shall be suspended until controls are effective.
- **Seasonal work restrictions:** Installation of pipe inlets and culverts involving excavation below the existing bed level shall be restricted to the dry season (October to May) unless temporary diversion or cofferdam systems are approved by the Engineer.
- **Slope protection during rain:** Exposed embankment slopes shall be covered with tarpaulins or geotextile fabric during forecasted heavy rain events. Temporary drainage swales shall be cut to divert runoff away from work faces.

Residual Impact

With implementation of the above measures, residual hydrological risks are expected to be low and manageable. The contractor shall maintain incident logs and report any flood-related damage to the Engineer within 24 hours.

6.5.2 Social Impacts

6.5.2.1 Labour and Working Conditions (ESS2)

Construction activities will engage skilled and unskilled labour, exposing workers to occupational health and safety risks. (Annexure-Q)

Impacts / Risks

- Accidents involving machinery and equipment.
- Exposure to dust, noise, and vibration.
- Poor living conditions at labour camps if not properly managed.

Mitigation Measures

Provision of Personal Protective Equipment (PPE) and Safety Training

- The Contractor shall provide appropriate, task-specific PPE to all workers at no cost, including safety helmets, high-visibility vests, gloves, safety boots, eye protection, hearing protection, and respiratory masks where required. PPE shall comply with internationally recognized standards (e.g., ISO, ANSI, EN) and be replaced regularly.

- Comprehensive occupational health and safety (OHS) training shall be conducted prior to mobilization and periodically throughout construction (Annexure-Q).Training shall cover safe operation of machinery, hazard identification, emergency response, working at heights, excavation safety, and electrical safety. Attendance records shall be maintained and refresher training provided after incidents or near-misses.

Sanitation, Clean Water, and Waste Management at Labour Camps

- All labour camps shall be designed, constructed, and operated in accordance with national labour laws, WHO guidelines, and ESS2 requirements. Camps shall be provided with adequate potable drinking water, gender-segregated and hygienic sanitation facilities, bathing areas, and proper drainage.(Annexure-N)

- Solid and liquid waste shall be collected, stored, and disposed of through approved systems to prevent environmental contamination and public health risks. Camps shall be maintained in clean and orderly condition, with routine inspections conducted by the Contractor and supervising Engineer, Annexure-O.

Enforcement of Worker Code of Conduct

- The Contractor shall develop and implement a Worker Code of Conduct (CoC) applicable to all employees, subcontractors, and security personnel (Annexure-A). The CoC shall clearly define acceptable behaviour, prohibit harassment, violence, discrimination, substance abuse, and sexual exploitation and abuse (SEA) / sexual harassment (SH). All workers shall be informed of the Code of Conduct in a language they understand and required to sign it prior to deployment. Violations shall be subject to disciplinary measures, including suspension or termination, in accordance with contractual and legal provisions.

First-Aid Facilities and Emergency Medical Arrangements

- Fully equipped first-aid kits shall be available at all construction sites, camps, and work fronts, and at least one trained first-aid responder shall be present per work shift. The Contractor shall establish emergency response procedures, including arrangements with nearby hospitals or health facilities for emergency treatment. Emergency contact numbers shall be displayed prominently, and transportation shall be available for rapid evacuation of injured workers. Regular drills shall be conducted to test preparedness.

Prohibition of Child Labour and Forced Labour

- The Contractor shall strictly prohibit child labour and forced or bonded labour, in full compliance with ESS2, national labour legislation, and ILO conventions. No person under the minimum legal working age shall be employed on the Project. Worker age verification procedures shall be implemented prior to hiring, and employment records shall be maintained. Any violations identified shall be reported immediately to the Engineer and relevant authorities, and corrective actions shall be enforced without delay (Annexure-N).

Dust, Noise, and Vibration Exposure Management

- To minimize occupational exposure, the Contractor shall implement dust suppression measures such as water spraying, provide hearing protection near noisy equipment, and limit exposure duration where vibration levels are high. Machinery shall be properly maintained to reduce excessive noise and vibration, and workers shall be rotated where necessary to reduce cumulative exposure.

Monitoring and Compliance

- The Contractor shall maintain OHS records, including incident logs, training registers, and inspection reports. Compliance with ESS2 requirements shall be monitored regularly by the Engineer, and corrective actions shall be implemented promptly where deficiencies are identified (Annexure-Q)

For a detailed analysis of potential adverse downstream failure scenarios and associated mitigation measures, refer to Section 6.5.2.5.1.

6.5.2.2 Community Health and Safety (ESS4)

Construction activities may pose safety risks to surrounding communities.

Impacts / Risks

- Accidents involving community members and construction machinery.
- Unsafe access to construction zones and open excavations.

Mitigation Measures

Fencing and Clear Demarcation of Construction Areas

- All active construction zones shall be physically fenced or cordoned off using durable barriers such as metal fencing, barricades, or high-visibility tape, depending on the level of risk. Construction boundaries shall be clearly marked to distinguish work areas from public spaces. Temporary fencing shall be maintained in good condition and relocated as construction progresses to ensure continuous protection of surrounding communities.

Installation of Warning Signage and Lighting

- The Contractor shall install clearly visible warning signs at all access points, crossings, and high-risk locations, including near machinery movement routes and excavations. Signage shall use internationally recognized symbols, be bilingual where appropriate, and be understandable to local communities (Annexure-P).
- Adequate night-time lighting shall be provided around construction sites, access roads, and hazards to ensure visibility and reduce the risk of accidents after dark, particularly in populated areas.

Barricading of Open Pits and Trenches

- All open excavations, pits, trenches, and foundation works shall be securely barricaded using rigid barriers or fencing. Where feasible, excavations shall be backfilled or temporarily covered when work is suspended. Warning tape alone shall not be used in high-risk areas. Regular inspections shall be conducted to ensure that barricades remain intact and effective.

Control of Public Access, Particularly by Children

- Uncontrolled access to construction areas shall be strictly prevented through fencing, guarded entry points, and clear exclusion zones. Special attention shall be given to preventing access by children, who may be attracted to construction equipment and excavations.

- Community awareness measures, including briefings to local residents and coordination with community leaders, shall be undertaken to inform the public about construction hazards, restricted areas, and safe alternative routes.

Maintenance of Emergency Response Arrangements

- The Contractor shall maintain site-specific emergency response procedures to address accidents involving community members, including traffic incidents and falls into excavations. Emergency contact numbers shall be displayed prominently at the site, and site personnel shall be trained to respond promptly and effectively.

- Coordination shall be established with local emergency services, health facilities, and authorities to ensure rapid response in case of incidents affecting the public.

Monitoring and Compliance

- Community safety measures shall be regularly inspected and monitored by the Contractor and the supervising Engineer. Any deficiencies identified shall be rectified immediately. Community grievances related to safety shall be recorded and addressed through the Project's Grievance Redress Mechanism (GRM).

6.5.2.3 Traffic and Construction Safety Management

Traffic and construction safety risks are anticipated during the construction phase due to increased movement of heavy construction vehicles, operation of machinery, temporary road diversions, and interaction between construction activities and the general public. If not properly managed, these risks may result in traffic congestion, accidents involving vehicles or pedestrians, and unsafe access to active construction zones (Annexure-P)

Construction Phase Impacts / Risks

During construction, the following traffic and safety risks may arise:

- Increased traffic volume due to construction vehicles transporting materials and equipment
- Disruption of normal traffic flow and temporary congestion
- Risk of accidents involving pedestrians, cyclists, and local traffic
- Unsafe public access to construction zones, including open pits and machinery operating areas
- Limited visibility and safety risks during night-time or low-visibility conditions

Mitigation Measures

Traffic and construction safety risks will be managed through a site-specific Traffic and Construction Safety Management Plan (TCSMP) prepared, implemented, and enforced by the Contractor, with oversight by the Supervision Consultants and the Employer.

- **Contractor-prepared Traffic and Construction Safety Management Plan**
  The Contractor shall prepare a comprehensive Traffic and Construction Safety Management Plan prior to mobilization. The Plan will define construction traffic routes, haulage schedules, material transport procedures, temporary road closures, diversion routes, pedestrian safety measures, emergency vehicle access, and coordination with local traffic police. The Plan shall also include construction site safety controls such as fencing, barricading, and access restrictions. The Plan will be submitted to the Supervision Consultant for review and approval and updated as construction progresses.

- **Traffic Control Personnel**
  Trained traffic personnel shall be deployed at all active work fronts, intersections, haul road crossings, and diversion points. Their responsibilities will include controlling construction vehicle entry and exit, guiding public traffic safely through or around construction areas, assisting pedestrians in crossing active routes, and immediately responding to unsafe traffic situations. Marshals will be equipped with high-visibility clothing, flags, whistles, and two-way communication devices.

- **Clearly marked diversions**
  All temporary traffic diversions shall be clearly designed, marked, and maintained for the duration of construction. Diversions will be provided with advance warning signs, directional signage, reflective barricades, cones, and night-time lighting where required. Diversion routes will be kept free of obstructions, regularly inspected, and adjusted as necessary to ensure safe and continuous movement of traffic, pedestrians, and

emergency vehicles.

- **Speed limits near settlements and sensitive receptors**
  Reduced speed limits shall be enforced in construction zones and near settlements, schools, mosques, markets, and other sensitive receptors. Speed limit signage will be installed at appropriate intervals, supported by warning signs and speed calming measures such as rumble strips where feasible. All construction vehicle drivers will receive induction training on speed restrictions, and repeated violations will result in disciplinary action or removal from site.

- **Demarcation and access control of construction areas**
  All active construction zones shall be clearly demarcated using fencing, barricades, warning tape, and signage to prevent unauthorized public access. Entry points to construction sites will be controlled, and security personnel will be deployed where necessary to restrict access by non-project personnel, particularly children.

- **Management of open excavations and hazardous areas**
  Open pits, trenches, and excavations shall be securely barricaded and clearly marked at all times. Where excavations remain open overnight, reflective barriers and warning lights shall be installed. Excavations near public access routes will be covered or protected to prevent accidental falls.

- **Night-time and low-visibility safety measures**
  Adequate lighting shall be provided at construction sites, diversions, and access roads during night-time or poor visibility conditions. Reflective signage and barriers will be used to enhance visibility of hazards and guide traffic safely.

- **Coordination with local authorities and communities**
  The Contractor shall coordinate with local traffic police, district administration, and community representatives to manage traffic disruptions and address safety concerns. Advance notice will be provided to communities regarding planned road closures, diversions, or high-risk construction activities.

Operation Phase Impacts

No significant traffic or construction safety risks are anticipated during the operation phase, as construction activities will have ceased and normal traffic conditions restored.

Residual Risk

With effective implementation of the Traffic and Construction Safety Management Plan and associated mitigation measures, residual traffic and construction safety risks are expected to be low and manageable.

6.5.2.4 Land Acquisition, Access Restriction and ESS5 Risks

Description

Although permanent land acquisition is not anticipated, the rehabilitation is taking place on government owned property; temporary impacts covered under ESS5 may arise.

Impacts / Risks

- Temporary loss of access to land or livelihoods.
- Impacts on informal users.
- Disproportionate impacts on vulnerable households.

Mitigation Measures

ESS5-related risks shall be managed proactively and in coordination with local authorities and

affected communities, even where permanent land acquisition is not required. Volunteer land donation (VLD) will be avoided to the maximum extent possible, and a resettlement plan for temporary displacement is provided for any temporary, physical or economical displacement at the project site. (Annexure-R)

- **Avoidance of Private Land and Livelihoods Where Feasible**
  Project design and construction planning shall prioritize avoidance of private land, economic activities, and livelihood sources to the maximum extent practicable. Construction methods, work sequencing, and access routes shall be optimized to remain within the existing right-of-way and public land. Where avoidance is not feasible, impacts shall be minimized in duration and extent.

- **Provision of Temporary Alternative Access Arrangements**
  Where construction activities temporarily disrupt access to land, houses, shops, farms, or community facilities, the Contractor shall provide safe and functional alternative access arrangements. These may include temporary paths, crossings, ramps, or access bridges, designed to ensure continued movement of people, livestock, and vehicles during construction.

- **Advance Notice to Affected Persons**
  All potentially affected persons shall be given timely advance notice prior to the commencement of activities that may restrict access or livelihoods. Notifications shall clearly explain the nature, duration, and timing of the impacts, as well as available mitigation measures and grievance channels. Information shall be communicated in a language and manner understandable to the affected communities.

- **Maintenance of a Functional Grievance Redress Mechanism (GRM)**
  The project-level Grievance Redress Mechanism shall be maintained and made accessible to all affected persons, including informal users. The GRM shall allow for the timely registration, assessment, and resolution of complaints related to access restrictions, livelihood impacts, or other ESS5-related concerns. Grievance records shall be maintained, and resolutions shall be communicated transparently to complainants.

- **Targeted Assistance to Vulnerable Households**
  Vulnerable households including female-headed households, the elderly, persons with disabilities, landless persons, and low-income groups shall receive targeted assistance to avoid disproportionate adverse impacts. Assistance may include additional consultations, priority restoration of access, livelihood support, or other context-appropriate measures identified in consultation with the affected persons.

- **Monitoring and Documentation**
  Temporary land access restrictions and associated mitigation measures shall be documented and monitored by the Contractor and supervising Engineer. Any unanticipated impacts shall be promptly addressed in accordance with ESS5 principles, and corrective actions shall be implemented without delay.

Impact on Population on Downstream Population

The proposed restoration and strengthening works of the Main Rabi Canal flood embankment under the Integrated Flood Resilience and Adaptation Project (IFRAP) – Package IV are expected to generate significant positive impacts for the downstream population residing within the command area of District Naseerabad. The project area encompasses several beneficiary

settlements and agricultural communities located along and downstream of the Main Rabi Canal and associated distributaries, including Haji Manzoor Ahmad Parkani, Shori, Goth Mola Buksh, Goth Fateh Muhammad, Goth Haji Imdad Hussain Qadri, Goth Haji Ghulam Hussain Rind, Goth Qaiser Khan, Zaheer Iqbal Jamot, and Goth Mir Gul Hassan Jamot.

The rehabilitation and strengthening of the flood embankment will substantially reduce the risk of overtopping, embankment breach, erosion, and flood inundation during high-flow events. Consequently, the project will enhance protection of downstream settlements, agricultural lands, irrigation infrastructure, local road networks, and community assets from recurrent flood damages. Improved embankment stability and hydraulic performance will also contribute to uninterrupted irrigation supplies through the Main Rabi Canal and associated distributary system, thereby supporting agricultural productivity and livelihood security of the local population.

During the construction phase, temporary localized impacts may occur in the form of restricted access, dust generation, increased movement of construction machinery, noise, and temporary disturbance to nearby communities. However, these impacts are expected to remain short-term, localized, and manageable through implementation of the Environmental and Social Management Plan (ESMP), including traffic management measures, dust suppression, community coordination, occupational safety measures, and operation of an effective Grievance Redress Mechanism (GRM). Overall, the project is anticipated to provide long-term socio-economic and flood protection benefits for the downstream population within the project influence area.

Table 6-7: Downstream Population of the sub project area.

Canals	Village(s)	Households	Population
Downstream			
Rabi canal 1	Killi Hasan Abad 1	600	4,800
Rabi canal 2	Killi Hasan Abad 2	700	5,600
	Kashk Abad	300	2,100
Total		1,600	12,500

6.5.2.4.1 Mitigation Measures for Downstream Impacts

Hydraulic and Structural Measures

The restoration and strengthening works of the Main Rabi Canal Flood Embankment under IFRAP Package-IV shall be designed and executed in accordance with recognized hydraulic and structural engineering standards to ensure stability and resilience against projected flood events. The design incorporates adequate freeboard, slope protection, and erosion control measures to minimize the risks of overtopping and embankment failure. Stone pitching, gabion aprons, and toe protection works shall be provided at vulnerable reaches to control scour and enhance hydraulic stability. Cross-drainage structures and culverts shall also be incorporated to maintain natural drainage patterns and prevent localized waterlogging.

Sediment and Water Quality Management

Sediment and water quality management measures shall be implemented during construction to minimize downstream impacts on the Main Rabi Canal system and adjoining agricultural areas. These measures include installation of silt traps, controlled runoff management, and proper spoil disposal arrangements. Construction materials, fuels, lubricants, and wastes shall be properly handled and stored to prevent contamination of surface water resources.

Flow Regulation and Flood Risk Management

Construction activities shall be phased to avoid disruption of canal flows and irrigation supplies,

particularly during peak irrigation and flood seasons. Temporary diversion arrangements and controlled construction sequencing shall be adopted where required. An Emergency Preparedness and Response Plan (EPRP) shall be implemented to address potential flood-related risks, including overtopping or localized embankment failure, in coordination with the Irrigation Department and relevant authorities.

Community Health and Safety Measures

Community health and safety measures shall be implemented to maintain safe access to agricultural lands, irrigation channels, and local roads during construction activities. Safety signage, barricading, traffic management arrangements, and controlled movement of construction machinery shall be maintained at active work sites. A functional Grievance Redress Mechanism (GRM) shall also remain operational throughout the project duration.

Environmental Monitoring and Compliance

Environmental monitoring shall be carried out throughout the construction period to ensure compliance with the approved Environmental and Social Management Plan (ESMP). Monitoring activities shall include ambient air quality, noise levels, water quality, waste management practices, and occupational health and safety compliance. Periodic inspection of stone pitching, gabion works, and embankment protection measures shall also be undertaken to ensure continued structural performance.

Stakeholder Engagement and Awareness

Continuous stakeholder engagement and community consultation shall be undertaken throughout project implementation to disseminate information regarding project activities, anticipated impacts, mitigation measures, and construction schedules. Awareness programs shall also be conducted to enhance community preparedness regarding flood risks and emergency response measures.

6.5.2.5 Labor Influx and Social Conflict

Influx of non-local workers may lead to social tension if unmanaged. Guidelines annexed as Annexure-N to be followed to avoid any inconvenience.

Impacts/Risks

Community worker conflicts during construction.

Mitigation Measures

Potential social risks arising from the influx of non-local workers shall be managed through inclusive employment practices, clear behavioral standards, and proactive community engagement.

- **Preference for Local Labour Where Feasible**

The Contractor shall give priority to hiring local workers for both skilled and unskilled positions where such skills are available, in coordination with local authorities and community representatives. This approach will help reduce labour influx, promote local economic benefits, and minimize potential tensions between workers and host communities.

- **Enforcement of Worker Code of Conduct**

All project workers, including subcontractors and security personnel, shall be required to adhere to a Worker Code of Conduct that defines acceptable behavior and explicitly prohibits harassment, intimidation, discrimination, substance abuse, and any form of gender-based violence. Workers shall receive orientation on the Code of Conduct upon engagement, and violations shall result in disciplinary action in accordance with project and legal requirements.

- **Appointment of a Community Liaison Officer**

The Contractor shall appoint a Community Liaison Officer (CLO) responsible for maintaining

regular communication with affected communities. The CLO shall facilitate information sharing, address community concerns related to construction activities and worker behavior, and support conflict prevention by ensuring that community feedback is communicated promptly to site management.

- **Prompt Resolution of Grievances through the GRM**

Community concerns and complaints related to labor influx or worker behavior shall be registered and addressed promptly through the Project's Grievance Redress Mechanism. The GRM shall be accessible, transparent, and responsive, with clear procedures for submission, review, and resolution of grievances. Records of grievances and actions taken shall be maintained for monitoring and reporting purposes.

- **Monitoring and Oversight**

The Engineer shall monitor the effectiveness of labour influx management measures and ensure that corrective actions are implemented where community-worker conflicts are identified or anticipated.

6.5.2.5.1 Adverse Downstream Failure Scenario Analysis

A. Statement of Risk

Despite the application of climate-resilient design standards, specifically the SSP2-4.5 scenario for the 100-year return period flood, a residual risk remains. A breach of the rehabilitated Main Rabi Canal flood protection embankment during an extreme flood event exceeding the design capacity, such as a greater than 100-year return period flood or a catastrophic failure of an upstream structure, could result in rapid, uncontrolled inundation of low-lying villages located downstream of the project area.

Based on the baseline assessment presented in Table 1-2 of Section 1.6, the following villages are identified as being at potential risk in a worst-case embankment breach scenario due to their proximity to the canal and lower elevation within the Kachhi Plain. Table 6-8 below summarizes the at-risk villages, their distance from the subproject area, estimated population, and primary risk category. It is noted that the population figures are estimates based on household data from Table 1-2 in Section 1.6. A detailed breach inundation mapping study shall be completed by the Contractor prior to construction as part of the Emergency Action Plan required under this ESMP.

Table 6-8: At-Risk Downstream Villages in Embankment Breach Scenario

Village Name	Distance from Subproject Area	Estimated Population at Risk	Primary Risk
Goth Haji Noor Muhammad Chakrani	0.30 km	4,800	Rapid inundation
Goth Haji Ghulam Hussain Rind	0.50 km	2,400	Flash flooding
Goth Fateh Muhammad Jamali	1.2 km	5,600	Prolonged inundation
Goth Haji Imdad Hussain Qadir	1.75 km	3,200	Flood wave arrival
Goth Muheem Khan Khotani	1.6 km	1,600	Inundation and access loss
Shori Data	2 km	2,100	Agricultural land damage

B. Risk Management Strategy

The project adopts a three-layered approach to manage this residual downstream failure risk. The first layer is preventive, encompassing design and construction measures aimed at minimizing the probability of a breach occurring. The second layer is early warning, involving detection and alert systems to identify an imminent failure and warn at-risk communities. The third layer is emergency response, which focuses on preparedness and evacuation to enable communities to respond effectively if a breach occurs.

C. Specific Mitigation Measures

The Contractor, under the supervision of the Construction Supervision Consultant and the Project Implementation Unit, shall implement the following measures to address the downstream failure risk.

1. Restriction of Construction during Monsoon Season

No construction activities involving excavation, embankment cutting, or placement of unprotected fill shall be carried out on the main canal embankment during the active monsoon season, defined as July 15 to September 15 of each year. This restriction is based on the rationale that this period carries the highest risk of flash floods, and partially completed embankment sections are vulnerable to overtopping and catastrophic failure. Construction during this period shall be limited to off-channel works such as pipe inlet fabrication, camp maintenance, and dry-area structure finishing. The Contractor is responsible for including the monsoon shut-down period in the main construction schedule, and the Construction Supervision Consultant is responsible for enforcing this restriction.

2. Installation of Hydrological Early Warning System

The Contractor shall install and maintain a minimum of two automatic water level gauges at critical locations along the Main Rabi Canal as described in Table 6-9 below.

Table 6-9: Water Level Gauge Locations and Specifications

Gauge Designation	Location	Purpose	Monitoring Responsibility
Gauge 1 (Upstream Trigger)	Immediately upstream of project reach at RD 0+000 or at canal off-take from river system	Detect rising flows entering the project reach	CSC Safety Officer
Gauge 2 (Mid-Reach Monitor)	Approximately RD 12+500	Monitor water levels within the project section	CSC Safety Officer

Pre-defined trigger levels shall be established in coordination with the Irrigation Department and based on the design flood levels under the SSP2-4.5 scenario for the 50-year return period flood, which is 2,049 cusecs. Table 6-10 below defines the trigger levels and corresponding required actions.

Table 6-10: Trigger Levels and Required Emergency Actions

Trigger Level	Water Level Condition	Required Actions
Alert Level	Water level reaches 0.3 meters below design freeboard	CSC and Contractor notified; daily inspections increased to twice daily; standby pumps and emergency equipment positioned
Evacuation Trigger Level	Water level reaches design freeboard level	Contractor halts all embankment-related work; CSC notifies PIU and District Emergency Officer of Naseerabad; Emergency Action Plan activated; community alert systems deployed

The Contractor is responsible for procuring and installing the gauges. The Construction Supervision Consultant shall verify calibration and data transmission. A designated person, specifically the Construction Supervision Consultant Safety Officer, shall monitor water levels daily during the monsoon season and immediately upon any flood warning issued by the Pakistan Meteorological Department.

3. Emergency Action Plan with Inundation Mapping and Community Alerts

A site-specific Emergency Action Plan shall be prepared by the Contractor and approved by the Construction Supervision Consultant and the Project Implementation Unit prior to the start of any earthworks. This Emergency Action Plan shall be appended to the Contingency and Emergency Response Plan provided in Annexure-R. Table 6-11 below specifies the required components of the Emergency Action Plan.

Table 6-11: Required Components of the Emergency Action Plan

Component	Description	Responsible Party	Component
Inundation Mapping	Simple map-based flood inundation model for worst-case embankment breach scenario (50-meter breach at lowest point of embankment) showing flood wave arrival times in hours for each at-risk village, identified safe zones, and primary and secondary evacuation routes	Contractor to prepare; CSC to approve	Inundation Mapping
Community Alert System	Two manually operated sirens or loudspeakers installed at mid-point of embankment and at Union Council office; roster of two community mobilizers per at-risk village trained to receive alerts and warn residents via pre-agreed signals such as drum beating or mosque loudspeaker announcements	Contractor to install; PIU to coordinate with Union Council	Community Alert System
Alert Protocol	One-page protocol in Urdu, Balochi and sindhi stating the following: If you hear the continuous siren for two minutes, evacuate immediately to the pre-identified safe zone using the marked route, do not delay, take your emergency bag, and help children, elderly, and disabled persons first	Contractor to prepare and distribute	Alert Protocol
Evacuation Drill	Full-scale emergency evacuation drill conducted before first monsoon season following contractor mobilization, involving representatives from at-risk villages, District PDMA Officer, and Contractor emergency response team	Contractor to conduct; CSC to verify; PIU to coordinate with district authorities	Evacuation Drill

A full-scale emergency evacuation drill shall be conducted before the first monsoon season following contractor mobilization. The drill shall involve representatives from at-risk villages, the District Emergency Officer, and the Contractor emergency response team. A drill report shall be submitted to the Project Implementation Unit and the World Bank.

The Contractor is responsible for preparing the Emergency Action Plan and conducting the drills. The Construction Supervision Consultant shall verify community training. The Project Implementation Unit shall coordinate with district authorities.

D. Residual Risk

Following the full implementation of the preventive measures described in subsection B, the early warning measures described in subsection C2, and the emergency response measures described in subsection C3, the residual risk to downstream communities from an embankment failure event is reduced from High to Low-Medium. Table 6-12 below summarizes the risk reduction achieved through each layer of the mitigation strategy.

Table 6-12: Residual Risk Assessment after Mitigation

Risk Layer	Mitigation Measure	Risk Reduction Achieved
Preventive	Climate-resilient design (SSP2-4.5 for 100-year flood)	High
Preventive	Monsoon construction restriction	Medium
Early Warning	Automatic water level gauges with trigger levels	High
Early Warning	Daily monitoring during monsoon season	Medium
Emergency Response	Inundation mapping and evacuation routes	High
Emergency Response	Community alert system and annual drills	High
Combined Residual Risk	All measures fully implemented	Low-Medium (Acceptable)

This residual risk is considered acceptable for a climate-adaptation infrastructure project of this nature, provided that the Early Warning System and Emergency Action Plan remain functional and are tested annually for the life of the structure.

E. Monitoring and Reporting

The Construction Supervision Consultant shall include a specific section in the Monthly ESMP Compliance Report on the status of the Early Warning System, including battery checks, siren function, and gauge readings. Any activation of the Alert Level or Evacuation Trigger Level shall be reported to the Project Implementation Unit and the World Bank within twenty-four hours. The annual evacuation drill report shall be submitted to the World Bank as part of the Project Annual E&S Progress Report. Table 6-13 below summarizes the monitoring and reporting requirements for this section.

Table 6-13: Monitoring and Reporting Requirements for Downstream Failure Risk

Monitoring Activity	Frequency	Responsible Party	Reporting Requirement
Early Warning System status check (batteries, siren, gauges)	Weekly during monsoon season; monthly otherwise	CSC Safety Officer	Included in Monthly ESMP Compliance Report
Alert Level or Evacuation Trigger Level activation	As occurs	CSC Safety Officer	Report to PIU and World Bank within 24 hours
Emergency evacuation drill	Annually before monsoon season	Contractor with CSC verification	Drill report submitted to PIU and World Bank as part of Annual E&S Progress Report

6.5.2.6 GBV / SEA / SH Risks

Labor influx may increase the risk of Gender-Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH) incidents. GBV & SEA guidelines attached in Annexure-J to be followed by the contractor. In general, presently the prevalence of SEA/SH doesn't exist in the area but due to the influx of local and non-local labor and during the peak of construction activities under all packages, there may be a risk of gender-based violence or sexual exploitation and abuse among women and children and other vulnerable population groups (poor women, single women living alone, elderly, infirm or ill, orphans, etc). The project Grievance Redressal Mechanism (GRM) has a mandate to cover the aspects of SEA/SH in the area if occurred during the construction period. This can contribute to enduring physical and mental

harm, while undercutting the ability of survivors, and often their families, to engage in meaningful, productive lives.

Impacts / Risks

Potential SEA/SH incidents during construction.

Mitigation Measures

Risks related to GBV, SEA, and SH associated with labour influx shall be managed through preventive, responsive, and enforcement-based measures., Annexure-J.

- **Enforcement of GBV-Inclusive Codes of Conduct**
  All project workers, including contractors, subcontractors, and security personnel, shall be required to sign and comply with a GBV-inclusive Code of Conduct. The Code shall clearly prohibit all forms of GBV, SEA, and SH, define unacceptable behaviours, and outline disciplinary actions for violations. The Code of Conduct shall be communicated in languages understood by workers and communities and enforced consistently throughout the construction period.

- **Mandatory Worker Training**
  All workers shall receive mandatory induction and refresher training on GBV, SEA, and SH risks prior to deployment and periodically during construction. Training shall cover expected standards of behavior, consequences of violations, respectful engagement with communities, and awareness of reporting mechanisms. Training records shall be maintained as part of project compliance documentation.

- **Establishment of Confidential Reporting Mechanisms**
  The Project shall establish safe, confidential, and survivor-centred reporting mechanisms for GBV, SEA, and SH incidents. Reporting channels may include designated focal persons, hotlines, or confidential complaint boxes, ensuring privacy and protection from retaliation. Information on reporting options shall be widely disseminated to workers and affected communities.

- **Referral to Support Services**
  Survivors of GBV, SEA, or SH incidents shall be referred promptly to appropriate support services, including medical care, psychosocial counselling, legal assistance, and protection services, in coordination with local service providers. Referrals shall respect survivor consent, confidentiality, and dignity, in line with World Bank good practice.

- **Zero-Tolerance Enforcement**
  A zero-tolerance approach shall be applied to any confirmed incidents of GBV, SEA, or SH. Disciplinary measures, including suspension, termination of employment, or referral to authorities, shall be enforced in accordance with national law and contractual provisions. Failure by the Contractor to implement GBV risk mitigation measures shall be treated as a contractual non-compliance.

- **Monitoring and Compliance**
  Implementation of GBV risk mitigation measures shall be regularly monitored by the Contractor and supervising Engineer. Records of training, Code of Conduct compliance, and grievance handling (without compromising confidentiality) shall be maintained and reviewed to ensure effectiveness.

Table 6-14: Gender-based violence or sexual exploitation and abuse

Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance
Direct	Short term	Reversible	Likely	Moderate	Medium adverse

Mitigation

- Adequate training to especially for migrant workers will be provided on the cultural norms of the local community.
- The project GRM has already mandated to uptake SEA/SH related grievances of the project, and its other related issues.
- Priority will be given to mitigate the risk of gender-based violence, sexual exploitation, and abuse.
- Appropriate transportation for vulnerable groups.
- The Contractor shall ensure that a code of conduct is developed for all staff and labor describing acceptable and prohibited behaviors (guidelines are given below):
- Inequality, discrimination, and marginalization, including on the basis of gender and or vulnerability, is avoided.
- Labor and or other staff engaged by the contractor are 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 action that can be taken in the event of GBV and SEA. Community members including poor women, single women living alone, elderly, infirm or ill, orphans should be made aware of the risks of GBV and SEA and redress measures, including case management support, health services, psychosocial support, police support and security, access to legal services, and shelter, if needed.
- Strive to reduce at-risk groups' exposure to GBV and SEA violence.
- Respect for human rights, gender balance, eradication of child and bonded labor
- Promotion of social dialogue among the stakeholders
- The contractor will be required to provide workers with documented information about the norms and local culture to be followed
- Culturally appropriate consultation mechanisms are followed by the contractor

To achieve the above-mentioned mitigation measures and guidelines, training will be organized and conducted on GBV and SEA at the field level.1 These trainings will be organized for the contractor and CSC staff, and it will be the responsibility of the Contractor. The contractor will hire services of a qualified professional Resource Person of GBV & SEA from the open market and an agreement will be signed between the contractor and Resource Person, under the supervision of PIU and CSC. At the end of each training, the Resource Person will produce a training report and other relevant material, submit to the concerned section of CSC with a cumulative report to PIU. This process will complete under the overall supervision and monitoring of the Social Safeguard Specialist and Gender Specialist of PIU and M&E consultants, as mentioned in table 7.1

The bidders will be required to submit Codes of Conduct of acceptable and prohibited behaviors with their bids. The CoCs will set clear boundaries for acceptable and unacceptable behaviors of all individuals and companies and will be signed by companies, managers, and individuals.

- Construction Contractor will specify respect for the local community and its cultural norms;
- Presentation of professional behavior and integrity when dealing with the local community;
- Discrimination is prohibited such as gender, age, ethnic or national origin, religion, disability, sexual orientation;

- Respect privacy, particularly among women;
- CoCs will specify sanctions, including for any incidents of SEA;
- The CoC will include specific prohibitions against SEA with children defined as anyone younger than 18 and commensurate sanctions;
- The contractor will be required to establish anti-sexual harassment policies that govern conduct in the workplace;
- The contractor's contract will include provisions for mandatory reporting of SEA incidents - links to GRM;
- The Contractor will demonstrate that they have the capacity to manage SEA risks, including SEA prevention and response action plan/s and key staff with appropriate experience;
- The contractor will be required to provide mandatory and repeated training to workers on sexual exploitation and abuse, and HIV/AIDS prevention and on the content and obligations derived from the code of conduct;
- Inappropriate behavior such as sexual harassment, gender-based violence, and sexual abuse is strongly prohibited;
- Zero tolerance for any form of harassment, bullying, or other offensive physical or verbal treatments.

Residual Impact

Following the implementation of these mitigation measures, the impact shall reduce to low adverse in the short term, reducing to neutral following completion of the works.

6.5.2.6.1 Water Rights and User Conflicts

A. Risk Assessment

The Main Rabi Canal rehabilitation restores original hydraulic capacity and does not increase design discharge or expand the command area. Therefore, no new or permanent water rights conflicts are anticipated.

However, temporary construction activities may cause localized grievances, as summarized in Table 6-14 below.

Table 6-15: Temporary Construction Impacts on Water Users

Activity	Impact	Duration	Affected Users
De-silting and excavation	Turbidity, reduced flow velocity	2 to 4 days	Farmers in affected reach
Flow diversion for structures	Partial or complete flow stoppage	1 to 3 days	Downstream farmers

B. Mitigation Measures

The Contractor shall implement the following measures.

1. Advance Notice. For planned flow diversion, provide 7 calendar days written notice posted at village mosques and Union Council office. For flow reduction, provide 3 calendar days verbal notice through Community Liaison Officer.

2. GRM Prioritization. Water-related complaints shall be treated as high priority in the Grievance Redress Mechanism, with acknowledgment within 24 hours and resolution within 3 working days.

Emergency complaints (complete flow stoppage without notice) shall be acknowledged within 2 hours and resolved within 12 hours.

3. Construction Timing. No flow diversion exceeding 24 hours shall be scheduled during peak irrigation demand periods (May to June and August to October) without PIU approval.

4. Water Coordination Committee. A Committee comprising SDO Irrigation, Contractor, CSC, and two farmer representatives (one upstream, one downstream) shall meet before construction and whenever a flow diversion exceeding 24 hours is proposed.

C. Residual Risk

Following implementation of the above measures, the residual risk of water-related conflicts is assessed as Low. No significant adverse impact on water rights is anticipated.

6.5.2.7 Cultural and Community Impacts

Construction activities may temporarily disrupt local routines and cultural practices.

Impacts / Risks

Temporary disturbance to daily life and social norms.

With respect to community access and crossings, the Main Rabi Canal has an average width of approximately 120 feet (36.6 meters) between bunds with continuous flowing water. No informal crossings such as footpaths, temporary bridges, or livestock crossings exist along the project reach because the canal width and flow conditions make such crossings unsafe and impractical. Community members currently access both sides of the canal exclusively through existing permanent bridges. The proposed embankment strengthening works will not alter, remove, or interfere with these permanent bridges. Therefore, no adverse impacts on community access or crossings are anticipated from the project

However, if any informal crossing is identified during construction, or during the dry period of the drains, the Contractor will provide a temporary alternative, after consultations with the community(ies) using any such informal pathways.

Mitigation Measures

Temporary social disturbances arising from construction activities shall be managed through early engagement, adaptive work planning, and culturally appropriate conduct.

- **Conduct Community Consultations**
  The Contractor, in coordination with the Client and local authorities, shall conduct regular and meaningful consultations with affected communities prior to and during construction. Consultations shall inform communities about planned activities, timelines, and potential temporary disruptions, and shall provide opportunities for community members to raise concerns and suggest mitigation measures. Feedback from consultations shall be documented and incorporated into construction planning where feasible.

- **Scheduling of Works to Avoid Sensitive Times**
  Construction activities shall be scheduled to avoid sensitive periods, including religious events, cultural ceremonies, market days, harvest seasons, and community gatherings, to the extent practicable. Where avoidance is not possible, advance notice shall be provided to affected communities, and work hours shall be adjusted to minimize disruption to daily routines.

- **Respect for Local Customs and Traditions**
  All project workers shall be required to respect local customs, traditions, and social norms. Cultural awareness shall be included in worker induction training, emphasizing appropriate behavior, dress codes, interaction with community members, and respect for religious and cultural sites. Any culturally sensitive issues raised by the community shall be addressed promptly through the Community Liaison Officer or GRM.

- **Monitoring and Adaptive Management**
  The effectiveness of social disturbance mitigation measures shall be monitored through community feedback, consultations, and the Grievance Redress Mechanism. Construction practices shall be adjusted as needed to address concerns and minimize social disruption.

Residual Impacts
With full implementation of the above mitigation measures, residual environmental and social impacts are expected to be low, localized, reversible, and manageable, while the Subproject will deliver long-term benefits in flood protection, agricultural productivity, and community resilience.

6.5.2.8 Archaeological and Cultural Heritage Site

As per the initial screening and environmental assessment, no archaeological or cultural heritage sites have been identified within the proposed subproject area. However, in the event of any accidental discovery of unidentified archaeological or cultural resources during construction activities, a Chance Find Procedure (Annexure-E) shall be strictly followed.

In case of such discovery, all construction activities in the affected area shall be immediately suspended, and the Contractor shall inform the Supervisory Consultant and Project Management Unit (PMU) without delay. A brief report, including photographic evidence and site location details, shall be prepared and submitted for further action.

If any cultural heritage resource is confirmed, a Cultural Heritage Management Plan shall be prepared, and subsequent activities shall be carried out in accordance with applicable regulatory requirements and approved procedures.

Physical Resettlement
Based on the current design and scope, the proposed rehabilitation works for the Rabi Canal will be carried out within the existing canal alignment, without any major deviation from the original layout. Therefore, no physical resettlement is anticipated, and no residential or commercial structures are expected to be affected.

Land Acquisition
The proposed rehabilitation works for the Rabi Canal will be implemented within the existing right-of-way (ROW) of the canal system. As such, no permanent land acquisition is required under the current project scope.

During stakeholder consultations, the possibility of any unforeseen land requirements was discussed. In such cases, the Voluntary Land Donation (VLD) process, in line with World Bank ESF requirements and national guidelines, will be followed. This process ensures proper documentation, verification of voluntary consent, and protection of vulnerable groups.

The following principles shall be adhered to under the VLD process:

- Verification of land ownership and confirmation of voluntary donation
- Suitability of the land for the intended purpose
- Confirmation that the donor is not economically vulnerable and retains sufficient landholding
- Land must be free from encumbrances
- No adverse livelihood impacts on the donor or vulnerable groups
- No monetary compensation shall be provided
- Legal transfer of land ownership in accordance with applicable procedures

At present, no private land acquisition is anticipated, and all construction activities will remain confined within the existing canal corridor.

6.5.3 Social and Cultural Impacts

The proposed Subproject is anticipated to contribute positively to the socio-economic fabric of the region, particularly due to its strategic location near the border of Balochistan province. By stimulating local employment opportunities and enhancing connectivity, the project is likely to catalyse ancillary economic activities such as small-scale trade, transport services, and hospitality support for the workforce. These benefits, while indirect, are expected to uplift the livelihoods of nearby communities over time.

However, during the construction phase, certain temporary and localized social and cultural impacts may arise, primarily due to the interaction between local-residents and incoming labourers (workforce). These impacts include:

- **Cultural Sensitivity and Lifestyle Shifts:** The presence of non-local workers may introduce different customs, languages, and social behaviours, which could lead to misunderstandings or discomfort among local populations, particularly in conservative or close-knit communities.
- **Potential for Social Tensions:** In rare cases, disputes may emerge due to differences in work ethics, communication barriers, or perceived inequities in employment opportunities. These tensions, if not managed proactively, could affect community cohesion.

- **Pressure on Local Resources:** A temporary increase in population may place additional demand on local water sources, sanitation facilities, and communal infrastructure, especially in smaller or resource-constrained settlements.

Despite these considerations, the overall magnitude of social and cultural impacts is assessed as minor and reversible, given the short-term nature of construction activities and the limited scale of workforce influx. These impacts are not expected to result in any long-term adverse effects on the local cultural identity or social structure.

Mitigation Measures

Although no significant mitigation is deemed necessary, the following good practice measures are recommended to pre-emptively address potential concerns and foster positive community relations:

- **Cultural Orientation for Workers:** Contractors shall provide basic orientation sessions to all incoming workers on local customs, traditions, and community expectations to promote mutual respect and minimize cultural friction and relevant training as mentioned in section-6

- **Code of Conduct:** A clear and enforceable Code of Conduct shall be implemented for all site personnel, emphasizing respectful behaviour, prohibition of harassment, and obedience to local norms.

- **Grievance Redress Mechanism (GRM):** the project GRM/LGRC shall be displayed to allow community members to voice concerns or complaints related to social interactions or workforce behaviour.

- **Community Engagement:** Regular consultations and information-sharing sessions with local stakeholders shall be conducted to maintain transparency, trust, and ensure that any emerging issues are addressed on time.

7

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

7 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The Environmental and Social Management Plan (ESMP) defines the arrangements, procedures, and monitoring requirements for managing environmental and social risks and impacts associated with the rehabilitation/reconstruction of flood-damaged infrastructure under the Sub-project. The ESMP translates the mitigation measures identified in Section 6 (Environmental and Social Impacts and Mitigation Measures) into implementable actions, including (i) institutional roles and responsibilities, (ii) monitoring and reporting requirements, (iii) grievance redressal mechanisms, and (iv) contractor obligations and budget provisions.

The ESMP ensures that the Subproject is implemented in accordance with applicable national environmental regulations, the project ESMF and site-specific instruments, and relevant international standards including the World Bank Environmental and Social Framework (ESF). Through strict implementation and supervision, the ESMP supports resilient recovery by minimizing adverse impacts, protecting workers and communities, and enhancing long-term sustainability of flood protection assets.

7.1 INSTITUTIONAL ARRANGEMENTS FOR E&S IMPLEMENTATION

The Subproject will be implemented through coordinated arrangements at the Federal and Provincial levels, consistent with the overall IFRAP institutional setup. Environmental and social (E&S) implementation responsibilities will be embedded within existing project implementation structures to ensure effective oversight, timely reporting, and accountability.

7.1.1 Federal Level (FPMU / MoPD&SI)

The Ministry of Planning, Development & Special Initiatives (MoPD&SI), through the Federal Project Management Unit (FPMU), will have overall responsibility for ensuring that the project is implemented in compliance with the ESMF and all site-specific E&S instruments, including this ESMP. An Environment and Social Management Unit (ESMU) may be established within the FPMU, staffed with designated E&S personnel/focal persons.

The ESMU will:

- Provide oversight and coordination for ESF compliance across provinces and components.
- Review consolidated E&S performance and incident reports and ensure timely escalation where required.
- Provide guidance, tools, and templates (e.g., monitoring checklists and reporting formats) for consistent field implementation.

7.1.2 Provincial Level (PIU / Component-I)

The Provincial Project Implementation Unit (PIU) will be responsible for implementation of Component-I (Community Infrastructure Rehabilitation) and for ensuring effective implementation of the ESMP at the Subproject level. PIU will deploy E&S specialists and/or focal persons at district/field levels as required.

The PIU E&S team will:

- Supervise implementation of the ESMP and contractor obligations using approved monitoring checklists.
- Coordinate with CSC and Contractor to ensure corrective actions are implemented in a timely manner.

- Maintain liaison with FPMU/ESMU to ensure consistent ESF compliance, reporting, and incident management.

7.2 ROLES AND RESPONSIBILITIES OF ENTITIES INVOLVED IN E&S MANAGEMENT

7.2.1 Project Implementation Unit (PIU)

The PIU is responsible for oversight, quality assurance, and reporting of ESMP implementation. Specifically, PIU shall:

- Provide technical support, oversight, and quality control to field E&S focal persons and implementing teams.
- Review, approve, and maintain records of E&S screening checklists and site-specific ESMPs/updates, as applicable.
- Ensure all bidding documents, BOQs, and contracts include relevant ESMP requirements and applicable E&S clauses.
- Ensure that Subproject activities do not fall under the exclusion list and remain within the approved scope.
- Compile site monitoring information (from CSC and Contractor) and submit consolidated E&S progress reporting to FPMU and the World Bank as per reporting schedule.
- Track grievances and beneficiary feedback in accordance with the SEP and GRM procedures and use this as a monitoring tool for ESMP implementation.

7.2.1.1 Serious Incident Notification:

If the PIU/FPMU becomes aware of a serious incident associated with the Subproject that may have significant adverse impacts on the environment, communities, the public, or workers, the PIU/FPMU shall notify the World Bank within **48 hours** of becoming aware and provide a subsequent detailed report and corrective actions within **30 days** (or earlier as required).

7.2.1.2 Completion and Site Restoration:

At Subproject completion, PIU shall verify that all ESMP measures have been implemented, including restoration of work areas, camps, borrow areas, and disposal sites to at least pre-project conditions. Any pending issues shall be resolved before works are certified as complete and contracts are closed.

7.2.2 Construction Supervision Consultants (CSC)

The CSC will provide day-to-day supervision and compliance verification of ESMP implementation and Contractor obligations. The CSC shall:

- Review the Contractor's Environmental & Social Management Plan (C-ESMP/CESMP) and confirm that it is consistent with the ESMP and contract requirements before construction begins.
- Supervise implementation of mitigation measures at all work sites and ancillary sites (borrow areas, camps, workshops, disposal sites, haul routes).
- Conduct routine inspections and verify compliance through checklists, photo records, and corrective action tracking.

- Require, verify, and monitor corrective actions in cases of non-compliance, and where necessary, prepare and submit corrective action plans for enforcement by the PIU.
- Submit monthly and quarterly E&S compliance monitoring reports to PIU in accordance with the reporting schedule.
- Notify PIU of serious incidents within 48 hours of awareness and support incident investigation and reporting.

Note: Internal audits may be conducted by the CSC at least once during the construction period (e.g., at 6 months) to evaluate compliance trends and recommend systemic improvements.

7.2.3 Construction Contractor (CC)

The Contractor is primarily responsible for implementing all ESMP mitigation measures and preparing detailed site-specific plans as part of the Contractor's ESMP (C-ESMP/CESMP). The Contractor shall:

- Prepare and submit the C-ESMP prior to mobilization, including site layout plans and method statements addressing E&S risks.
- Prepare sub-plans (as applicable) including OHS Plan, Waste and Spoil Management Plan, Traffic and Construction Safety Management Plan, Camp Management Plan, Emergency Response Plan, Community Health and Safety Plan, Labor Management Plan, and GBV/SEA/SH prevention measures as required by the ESMP and contract.
- Select camps, yards, material storage areas, and waste disposal sites in accordance with ESMP siting requirements.
- Conduct E&S induction and periodic training (including toolbox talks) for workers and staff and maintain training records.
- Arrange baseline and periodic environmental monitoring (air, noise, water) as required, through qualified laboratories.
- Maintain records of incidents, non-compliance, corrective actions, grievances, and monitoring results and submit monthly reports to CSC and PIU.
- Ensure availability and proper use of PPE, safety signage, firefighting equipment, and spill response materials.

7.2.4 Contractor's Organizational Framework

The Contractor shall designate qualified staff to manage ESHS compliance and reporting. At minimum, the Contractor shall appoint:

- Occupational Health and Safety Officer / Safety Supervisor
- Paramedic / First Aid Staff (as required by site risk profile)
- Environmental/Social Officer (or Environmental Engineer where required)
- Community Liaison Officer
- Gender Mobilizer (where relevant and as directed by the PIU.)

CVs and experience evidence shall be submitted to CSC for review prior to mobilization. The appointed staff must meet contract specifications and ESMP requirements.

7.2.5 Reporting and Documentation

7.2.5.1 Meetings

A pre-construction meeting will be held after contract award and prior to mobilization to confirm reporting formats, monitoring procedures, escalation protocols, and corrective action workflows. Participants shall include PIU Team, CSC and Contractor staff.

7.2.5.2 Communications

Routine site communications may be verbal; however, formal instructions related to ESMP compliance, corrective actions, or repeated non-compliance shall be issued in writing by CSC under the civil works contract and copied to PIU.

7.2.5.3 Reporting Frequency and Distribution

The Contractor and CSC shall produce monthly reports summarizing compliance status, non-compliances, corrective actions, and monitoring results. Where an independent M&E consultant is engaged, third-party monitoring reports shall also be submitted. The report distribution is provided in Table 7-1.

Table 7-1: Distribution of Periodic Reports

S. No	Report	Prepared by	Frequency	Reviewed by	Distribution
1	Monthly CSC Compliance Report (see report template in Appendix -E)	CSC	Monthly	ES PIU	PMU, Contractor
2	Monthly Contractor's ES Mitigation and Management Compliance Report	Contractor's Environmental Coordinator/ Officer	Monthly	ES CSC	PIU & CSC
3	Monthly M&E ESMP Monitoring Report	M&E Consultant	Monthly	ES PIU	ES PIU
4	Quarterly ESMP Progress Report	CSC	Quarterly	PIU and World Bank	PIU and World Bank

7.3 INCLUSION OF ESMP IN CONTRACT DOCUMENTS

The approved ESMP shall form part of the bidding/contract documents and shall be binding on the Contractor. ESMP requirements shall be reflected in technical specifications, BOQs, and contractual clauses to ensure adequate resources are allocated and that compliance is enforceable through contractual remedies.

Implementation shall be coordinated with the construction program so that mitigation measures are applied at the appropriate stage, supported by adequate staffing, equipment, and budget.

7.4 GRIEVANCE REDRESS MECHANISM (GRM)

An effective Grievance Redress Mechanism (GRM) is essential to ensure that concerns, complaints, and feedback from project-affected persons and other stakeholders are addressed in a timely, transparent, and fair manner. The Project has an established GRM under the overarching implementation arrangements, and the Subproject will adopt and follow the same GRM mechanism. The purpose of applying the Project GRM at Subproject level is to (i) provide an accessible channel for raising concerns, (ii) resolve issues early to avoid escalation and implementation delays, and (iii) strengthen accountability and community trust throughout implementation.

The GRM will be available to all stakeholders, including local communities, vulnerable households, women, and workers, and will be implemented in line with the Stakeholder

Engagement Plan (SEP) and relevant requirements of the World Bank Environmental and Social Framework (including ESS2, ESS4 and ESS10). The GRM will operate alongside routine consultation and community liaison arrangements and will be publicized in local language(s) through culturally appropriate means.

7.4.1 Proposed GRM (Project Mechanism to be followed)

The Subproject will implement the Project GRM as already established under IFRAP. Complaints may be submitted through multiple channels, including in-person submission at designated project offices, through telephone/mobile contact, written applications, email, or through community representatives/focal persons where such arrangements exist under the Project. Information about grievance channels, submission requirements, expected timelines, and escalation options will be shared with communities prior to mobilization and during implementation, including special outreach for women and vulnerable groups.

7.4.2 Receiving and Recording Grievances

All grievances received under the Subproject will be recorded in a grievance log/register maintained by the PIU in accordance with the Project GRM procedures. Each complaint will be assigned a unique tracking number, and the following information will be recorded as applicable:

- Unique grievance tracking number
- Name and contact information of the complainant (unless anonymous)
- Date of submission
- Mode of submission (in-person/phone/email/written/through representative)
- Location of the issue (Subproject site/segment/settlement, as relevant)
- Description of the grievance and any supporting evidence
- Category/type of grievance (e.g., access, construction impacts, safety, labour, GBV, etc.)
- Action taken, responsible person/entity, and resolution status

The grievance register will be maintained systematically and will be available for review by relevant Project authorities and monitoring entities, consistent with confidentiality requirements (particularly for sensitive cases).

7.4.3 Grievance Handling and Resolution Process

Grievances will be addressed following the Project GRM timelines and steps, as summarized below:

Stage 1: Acknowledgement and Logging

Upon receipt, the grievance will be acknowledged and logged. Confirmation of receipt will be sent to the complainant within two working days (where contact information is available).

Stage 2: Preliminary Review and Investigation

A preliminary review and investigation will be carried out to determine the cause and appropriate corrective action. Where required, additional information may be sought from the complainant. The preliminary investigation will be completed within seven working days of receipt, and an interim response will be communicated to the complainant describing the findings and proposed actions.

Stage 3: Resolution and Corrective Action

Corrective actions will be implemented by the responsible entity (Contractor/CSC/PIU, as applicable) and tracked to closure. Where the complainant is satisfied, the grievance will be recorded as resolved and closed in the grievance log.

Stage 4: Escalation

If the complainant is not satisfied with the proposed resolution, the grievance will be escalated in accordance with the Project GRM procedures for further review and decision-making. A hearing/ meeting may be arranged where necessary to facilitate resolution, including mediation where appropriate. Escalated grievances will be addressed within fifteen working days of escalation, where practicable.

Stage 5: Recourse to Legal System

If the complainant remains dissatisfied after exhaustion of the Project GRM process, they retain the right to pursue the matter through the appropriate judicial system.

7.4.4 Record Keeping, Reporting, and Periodic Review

Maintaining accurate grievance records is critical for transparency, accountability, and corrective action tracking. The PIU will compile grievance statistics (received/resolved/pending), including trend analysis and recurring issues, and include these in regular Project monitoring reports. Grievance data will be maintained in a manner that enables disaggregation (e.g., by gender and vulnerability), while ensuring confidentiality where required.

The GRM performance will be reviewed periodically under the Project's overall monitoring arrangements to assess effectiveness, responsiveness, and accessibility, and to identify opportunities for improvement. Corrective actions (e.g., improved communication, additional outreach, strengthened response time, or contractor enforcement) will be initiated where recurring issues are identified.

7.4.5 Role of Women in the GRM

To ensure inclusivity and gender-responsive access, GRM information will be shared with women through culturally appropriate means and local language(s). Where required, a female focal person and outreach visits will be used to facilitate women's access to grievance channels. Women-related concerns including safety, access constraints, water and sanitation concerns, livelihood disruption, and other construction-related impacts will be addressed with priority and sensitivity.

GBV/SEA/SH-related grievances, if any, will be handled through confidential and survivor-centred procedures consistent with the Project GRM arrangements. Such cases will not be recorded in public registers with identifying information; instead, they will be managed through secure channels and referral pathways to appropriate services (health, psychosocial support, legal aid, and protection services), as applicable.

7.4.6 Worker Grievance Redress Mechanism (W-GRM) – SST-2

In addition to the Project GRM for communities, the Contractor will establish and maintain a dedicated Worker GRM in line with ESS2 and the Project's labour management requirements. The worker's GRM will provide workers with a confidential, accessible, and non-retaliatory mechanism to raise concerns related to working conditions, wages, OHS issues, discrimination, harassment, or other workplace grievances.

Key features of the Worker GRM include:

- Confidentiality: Complaints handled discreetly to prevent retaliation
- Multiple access channels: Verbal, written, anonymous submissions (e.g., drop-box at site offices)
- Timely response and escalation: If unresolved at site level, escalation to CSC/PIU as per Project procedures
- Documentation: Worker grievances recorded and tracked to closure, with confidentiality maintained for sensitive matters

It is proposed to establish the following prior to commencing project implementation activities including pre-construction activities:

- Grievance Focal Points (GFPs), which will educate people from each community. The GFPs should be community members who are easily approached by the community. The GFPs will be provided training by the Social Section of the PSIAC and PMU;
- A Public Complaints Centre (PCC) will be established in the project office and will be responsible for receiving, lodge, and investigating complaints;
- A Grievance Redress Committee (GRC) will be established in the PIU office, responsible for addressing grievances forwarded by the PCC.

7.4.7 Grievance Focal Points (GFPs)

The GFPs will be educated/literate people from each community that will assist and facilitate the community members in reporting grievances resulting from project activities. The GFPs will be provided training by the PMU/ CSC in facilitating grievance redress. The project team will facilitate the process and the GFPs (a female and male) will be selected for the sub-project area

7.4.7.1 Public Complaints Centre

In its capacity as the project proponent, the PIU in consultation with the Irrigation Department, Balochistan will establish a Public Complaints Centre (PCC) in the PIU office. The PIU and the local government bodies will issue public notices to inform the public within the project area of the Grievance Redress Mechanism. The PCC's phone number, fax, address, the email address will be disseminated to the people through displays at the respective offices of the Deputy Commissioners Naseerabad districts.

The PCC will be staffed by a full-time officer from the PIU and will be independent of the Project Consultants and contractor/operator. The officer should have experience and/or training in dealing with complaints and mediation of disputes. The PCC officer will have resources and facilities to maintain a complaint database and communicate with contractors, Site Engineers, CSC, DC Naseerabad with complainants.

The PCC will be responsible to receive, log, and investigate grievances at PCC level. However, the PCC is unable to resolve the grievances. The grievances will be referred to as GRC.

7.4.7.2 Role and Responsibilities of PCC

The responsibilities of the PCC are:

a. The PCC will log the complaint and date of receipt onto the complaint database and inform the CSC and the Contractor;

b. The PCC will instruct contractors and CSC to refer to any complaints that they have received directly to the CSC. Similarly, the CSC will coordinate with local government to “capture” complaints made directly to them;
c. The PCC, with the CSC and the Contractor, will investigate the complaint to determine its validity and to assess whether the source of the problem is due to project activities, and identify appropriate corrective measures. If corrective measures are necessary, PCC, through the CSC, will instruct the Contractor to take necessary action.
d. The PCC will inform the Complainant of the investigation results and the action taken; If the complaint is transferred from local government agencies, the CSC will submit an interim report to local government agencies on the status of the complaint investigation and follow-up action within the time frame assigned by the above agencies.
e. The PCC will review the Contractors response on the identified mitigation measures and the updated situation;
f. The PCC will undertake additional monitoring, as necessary, to verify as well as review that any valid reason for complaint does not recur.

During the complaint investigation, the PCC should work together with the Contractor and the CSC. If mitigation measures are identified in the investigation, the Contractor will promptly carry out the mitigation. CSC will ensure that the measures are carried out by the Contractor.

7.4.8 Grievance Redress Committee (GRC)

The GRC will function as an independent body that will regulate PCC and the grievance redress process. At the sub-project level, a GRC will be headed by the Project Director and will be comprised of a Social safeguard Speciliast Senior Engineer from PIU, and representative from the community.

7.4.8.1 GRM Steps and Timeframe

Procedures and timeframes for the grievance redress process are as follows:

Stage 1: When a grievance arises, the affected person may contact the contractor/operator or GFP, directly to resolve the issue of concern. If the issue is successfully resolved, no further follow-up is required;

Stage 2: If no ad hoc solution can be found, the affected person/s will submit an oral or written complaint to the PCC by themselves or through GRM entry points (the CFP, CSC and Contractor/Operator). For an oral complaint, the PCC must make a written record. For each complaint, the PCC must investigate the complaint, assess its eligibility, and identify an appropriate solution. It will provide a clear response within five (5) working days to the complainant CSC and Contractor. The PCC will, as necessary, through CSC instruct the Contractor to take corrective actions. The PCC will review the Contractor’s response and undertake additional monitoring. During the complaint investigation, the PCC will work in close consultation with the Contractors, and the Supervising Engineer (during construction), and the PIU representatives (during operation). The contractors during construction and the CSC during operation should implement the redress solution and convey the outcome to the PCC within seven (7) working days;

Stage 3: If no solution can be identified by the PCC or if the complainant is not satisfied with the suggested solution under Stage 2, the PCC will organize, within two (2) weeks, a multi-stakeholder meeting through GRC under the auspices of the PD-PMU, where all relevant

stakeholders (i.e., the complainant, CSC, contractor/operator, relevant local government offices) will be invited. The meeting should result in a solution acceptable to all, and identify responsibilities and an action plan. The contractors during construction and the CSC during operation should implement the agreed-upon redress solution and convey the outcome to the PCC within seven (7) working days;

Stage 4: If the affected people are still not satisfied with the reply in Stage 4, he or she can go through to local judicial proceedings.

7.4.8.2 The budget of GRM Implementation

The cost for the implementation of GRM activities of the sub project will be beard by the construction contractor.

7.5 ENVIRONMENTAL AND SOCIAL MITIGATION AND MONITORING PLAN

The mitigation and monitoring plan (Table 7-2) is the core implementation tool for tracking compliance with the ESMP. It identifies impacts, mitigation measures, implementing responsibilities, monitoring locations, frequencies, parameters, and reporting responsibilities.

Table 7-2: Environmental and Social Management Plan

Activities	Environmental / Social Impact	Mitigation Measures	Implementing Entity	Monitoring Location	Monitoring Frequency / Duration	Monitoring Parameter (for compliant action)	CSC	PIU	M&EC
Earthworks, embankment construction, borrow areas	Soil erosion, sedimentation, landform alteration	Optimize alignment; minimize cut-and-fill; erosion- Resistant slopes; phased excavation; stabilize exposed soil; rehabilitate borrow pits; avoid productive agricultural land.	Contractor	Work fronts, embankments, borrow areas	Weekly during construction	Area of active erosion ≤ 5 m² per 500 m of embankment; all disturbed slopes >10% gradient stabilized within 7 days of earthwork completion.	✓	✓	
Fuel storage and equipment maintenance	Soil and groundwater contamination	Bunded and impervious fuel storage and maintenance areas with spill kits; immediate cleanup of spills.	Contractor	Camps and work sites	Monthly	No oil or fuel contamination observed	✓	✓	
Design of embankments and drainage	Reduced effectiveness under extreme rainfall	Climate-resilient design with adequate freeboard and	Design Consultant / PMU	Design stage	Once during design approval	Climate-resilient design	✓	✓	

Activities	Environmental / Social Impact	Mitigation Measures	Implementing Entity	Monitoring Location	Monitoring Frequency / Duration	Monitoring Parameter (for compliant action)	CSC	PIU	M&EC
		enhanced drainage; hydrology reviewed against recent floods and climate projections.				parameters incorporated			
Construction activities and material transport	Dust emissions and exhaust pollution	Water sprinkling; cover materials; maintain machinery; provide masks; prohibit open burning.	Contractor	Construction sites, haul routes, camps	Monthly	PM10 concentration ≤ 150 µg/m³ (24-hour NEQS)	✓	✓	
Operation of construction machinery	Noise disturbance to communities	Low-noise equipment; daytime work only; no pressure horns; hearing protection; noise monitoring.	Contractor	Near settlements, schools, mosques	Monthly	Noise within NEQS; no unresolved complaints	✓	✓	

Activities	Environmental / Social Impact	Mitigation Measures	Implementing Entity	Monitoring Location	Monitoring Frequency / Duration	Monitoring Parameter (for compliant action)	CSC	PIU	M&E C
Construction camps and works near water bodies	Surface and groundwater contamination	Septic tanks and settling ponds; no washing near water bodies; camps and fuel storage ≥1 km from water sources; debris control.	Contractor	Camps, drains, irrigation channels	Monthly	Fecal coliform ≤ 0 per 100 mL; turbidity ≤ 50 NTU above baseline	✓	✓	
Construction and camp waste generation	Soil and water pollution	Waste segregation; disposal at approved sites; used oil to licensed recyclers; reuse bituminous material.	Contractor	Camps, disposal sites	Monthly	Zero uncontrolled dumping incidents; 100% of waste streams documented with quantities in kilograms and disposal; 100% of used oil recycled	✓	✓	✓
Camp establishment and access routes	Loss of vegetation; dust on crops	Limit vegetation clearance; dust suppression; crop protection; compensatory plantation with communities.	Contractor	Camps, access routes	Monthly	Area of vegetation cleared (m²) per approved design; compensatory plantation ratio 5:1	✓	✓	

Activities	Environmental / Social Impact	Mitigation Measures	Implementing Entity	Monitoring Location	Monitoring Frequency / Duration	Monitoring Parameter (for compliant action)	CSC	PIU	M&E C
Employment of construction workforce	Occupational injuries; poor working conditions	PPE; safety training; sanitation and water at camps; Code of Conduct; no child/forced labor.	Contractor	Work sites and camps	Monthly	100% of workers provided with appropriate PPE; 100% trained	✓	✓	✓
Construction near communities	Accidents; unsafe access	Fencing and demarcation; barricade open pits; warning signage and lighting; emergency response.	Contractor	Work sites near settlements	Weekly	No unauthorized access; no accidents	✓	✓	
Construction traffic and site activities	Traffic congestion; accidents; public safety risks	Approved TCSMP; traffic control personnel; diversions and signage; speed limits; authority Coordination.	Contractor	Haul routes, work sites, settlements	Daily during construction	Zero traffic accidents involving project vehicles and public; 100% of TCSMP control points (signage, flagmen, diversions) inspected and found compliant bi-weekly	✓	✓	✓
Temporary access restriction	Livelihood disruption; vulnerable groups affected	Avoid private land; temporary access; advance	Contractor / PMU	Project area	Monthly	Complaints resolved within timeframe	✓	✓	

Activities	Environmental / Social Impact	Mitigation Measures	Implementing Entity	Monitoring Location	Monitoring Frequency / Duration	Monitoring Parameter (for compliant action)	CSC	PIU	M&E C
		notice; GRM; targeted assistance.							
Labor influx	Community–worker conflict	Local hiring; Code of Conduct; Community Liaison Officer; GRM use.	Contractor	Camps and communities	Monthly	100% of complaints resolved within 30 working days	✓	✓	
Labor influx	GBV / SEA / SH risks	GBV Code of Conduct; worker training; confidential reporting; referrals; zero tolerance.	Contractor	All work sites	Quarterly	100% of workers trained; training attendance register maintained	✓	✓	✓
Construction activities	Disturbance to cultural practices	Community consultations; avoid sensitive times; respect customs.	Contractor	Project area	Monthly	Number of unresolved community complaints >14 days old = 0	✓	✓	
Overall project implementation	Residual environmental and social risks	Continuous ESMP monitoring, supervision, and corrective actions.	Contractor / PMU	Entire project	Throughout project	Residual impacts low and manageable	✓	✓	✓

7.5.1 Reporting and Non-Compliance Management

The Contractor shall submit monthly compliance reports to CSC. CSC shall verify compliance, document non-compliances, and submit verified reports to PIU. The PIU shall apply contractual enforcement measures where repeated or material non-compliance occurs, including withholding payments, requiring corrective actions, or work stoppage in serious cases.

7.5.2 ESMP Budget

The costs associated with ESMP implementation have been incorporated into the Contractor's BOQ as distinct and enforceable line items to ensure accountability and compliance during construction. The budget covers key environmental and social mitigation measures, including preparation of the Contractor's ESMP and sub-plans, waste management, erosion and dust control, community consultations, GRM implementation, and provision of occupational health and safety (OHS) equipment, in line with applicable ESF requirements.

Additional provisions have been made for training and capacity building, environmental and social monitoring (including laboratory testing), reporting, and dedicated ESMP implementation staff such as HSE and community liaison personnel. A contingency allocation is also included to address unforeseen risks, ensuring effective and continuous implementation of ESMP measures throughout the project lifecycle.

Table 7-3: ESMP Cost Breakdown

Sr. No.	Component	Description / Cost Basis	Qty	Unit Rate	Estimated Cost PKR
1	**Environmental Mitigation Measures**				
1.1	Contractor ESMP / Sub-plans	Preparation of C-ESMP, OHS Plan, Waste Management Plan, Emergency Response Plan, Traffic Management Plan, Labour Management Procedure, GRM and GBV/SEA/SH procedure	1 job	150,000	150,000
1.2	Waste management — solid/hazardous	Waste bins, disposal of construction/camp waste, spill kits, minor hazardous waste handling, increased duration allowance	18 months	15,555	280,000
1.3	Erosion control, noise and vibration control	Temporary drains, sandbags, silt traps, tarpaulin covers, exposed-area protection, signage, barricading and maintenance	18 months	13,890	250,000
1.4	Dust suppression	Water sprinkling through bowser/truck; assumed 144 trips @ Rs. 1,800/trip	144 trips	1,800	259,200
		Subtotal — Environmental Mitigation			**939,200**
2	**Social Mitigation Measures**				
2.1	Community consultation and GRM	Six quarterly consultation meetings, GRM documentation, complaint follow-up, community notices, local travel and communication	6 quarters	55,000	330,000

Sr. No.	Component	Description / Cost Basis	Qty	Unit Rate	Estimated Cost PKR
2.2	HSE / PPE cost	Initial PPE, replacement PPE, first-aid kits, fire extinguishers, signage, barricading and safety consumables for extended duration	1 job	493,000	493,000
		Subtotal — Social Mitigation			**823,000**
3	**Training and Capacity Building**				
3.1	Awareness campaigns and trainings	Training on traffic safety, OHS, emergency response, GBV/SEA/SH, GRM, gender and environment; six quarterly sessions and regular toolbox talks	18 months	23,600	425,000
		Subtotal — Training and Capacity Building			**425,000**
4	**Monitoring and Reporting**				
4.1	Environmental quality monitoring	Quarterly monitoring of air, water and noise through qualified laboratory	6 rounds	70,000	420,000
4.2	Social and environmental impact monitoring	Field visits, consultations, FGDs, community feedback, photographic record and mitigation verification	6 quarters	55,000	330,000
4.3	Reporting and documentation	Monthly ESMP compliance reports, photographic record, incident reports and final compliance report	18 months	10,700	194,000
		Subtotal - Monitoring and Reporting			**944,000**
5	**HR / ESMP Implementation Staff**				
5.1	HSE Officer	Part-time/site-visit basis; 4 visits/month @ Rs. 15,000/visit	72 visits	15,000	1,080,000
5.2	Community and Safety Liaison Officer	Part-time support for community coordination, GRM and safety communication	18 months	25,000	450,000
5.3	Paramedic / First-aid support	On-call/part-time medical support and first-aid management	18 months	18,000	324,000
		Subtotal - HR Cost			**1,854,000**
6	**Contingency**	For emergency incidents, loud speakers, sirens, water gauges, additional mitigation, minor spill response, additional consultations or unforeseen ESMP requirements; 5% of subtotal 7% of subtotal	7%	-	348,964
		Total ESMP Budget - 18 Months			**5,334,164**

7.5.3 Training and Skill Development

Training requirements shall include induction, occupational health and safety, environmental management, social and gender awareness, and specialized modules (hazardous materials, traffic safety, camp management). The Contractor shall maintain records and submit to CSC and PIU.

7.6 DEVELOPMENT OF OTHER E&S PLANS / INSTRUMENTS

Prior to mobilization, the Contractor shall prepare a C-ESMP/CESMP consistent with this ESMP and include relevant sub-plans, including OHS Plan, Waste and Spoil Management Plan, Traffic Management Plan, Emergency Response Plan, Community Health and Safety Plan, Labor Management Plan, Camp Management Plan, Gender Action measures (as applicable), and Chance Find Procedure.

Each sub-plan shall specify responsibilities, monitoring, reporting, and enforcement procedures and shall be updated as necessary during construction.

8 REFERENCES

The following documents were referred to during the preparation of ESMP.

1. Bidding Documents (Rabi Canal)
2. Engineering Drawings (Rabi Canal)
3. Initial Environmental Examination (IEE), IEE Report – Rehabilitation/Strengthening of the Water conservation structures, Flood Protection Schemes in District Naseer Abad.
4. The Balochistan Environmental Protection Act, 2012.
5. The Pakistan Environmental Protection Act, 1997.
6. The Balochistan Wildlife Protection, Preservation, Conservation and Management Act, 2014.
7. The International Union for Conservation of Nature (IUCN) Red List of Threatened Species.
8. Guidelines for Public Consultation, Pakistan Environmental Protection Agency (Pak-EPA).
9. National Disaster Management Plan (NDMP), Government of Pakistan, 2012.

ANNEXURES

ANNEXURE -A

CODE OF CONDUCT FOR CONTRACTOR'S STAFF

1. Purpose

This Code of Conduct establishes mandatory standards of behavior for all contractor personnel engaged under the project. Compliance with this Code is a contractual obligation and applies to all staff, workers, subcontractors, and associated personnel.

All personnel are required to sign this Code of Conduct prior to commencement of work. Any refusal to sign must be documented in writing, including justification.

2. Social Conduct Requirements

All personnel shall:

- Maintain professional and respectful behavior toward local communities at all times.
- Respect local customs, traditions, and cultural norms.
- Refrain from any form of discrimination based on gender, age, ethnicity, nationality, religion, disability, or sexual orientation.
- Respect privacy and dignity, particularly of women and vulnerable groups.
- Strictly prohibit and refrain from sexual harassment, gender-based violence (GBV), sexual exploitation and abuse (SEA), and any form of inappropriate sexual conduct.
- Demonstrate responsible and discreet personal behavior, including adherence to public health awareness measures (including HIV/AIDS awareness).

3. Health and Safety Obligations

All personnel shall:

- Comply fully with site-specific Health and Safety Plans.
- Demonstrate commitment to workplace safety and accident prevention.
- Maintain zero tolerance for harassment, bullying, intimidation, or offensive physical or verbal behavior.
- Properly use Personal Protective Equipment (PPE) provided at all times.
- Participate in mandatory health and safety training sessions.

4. Environmental Protection Obligations

All personnel shall:

- Avoid any activity that causes environmental damage.
- Refrain from hunting, poaching, or harming wildlife.
- Prohibit illegal tree cutting or vegetation removal.
- Comply with all pollution prevention and waste management measures.
- Follow environmental rules and regulations applicable to the project site.

TEMPLATE FOR PROJECT WORKERS CODE OF CONDUCT

I, _____, acknowledge that preventing any misconduct as stipulated in this code of conduct, including sexual exploitation and abuse (SEA), sexual harassment (SH), and child abuse/exploitation are important. Any activity, which constitute acts of gross misconduct are therefore grounds for sanctions, penalties or even termination of employment. All forms of misconduct are unacceptable be it on the work site, the work site surroundings, or at worker's camps. Prosecution of those who commit any such misconduct will be pursued as appropriate. I agree that while working on this project, I will:

1. Consent to security background check;

2. Treat women, children (persons under the age of 18) and persons with disability with respect regardless of race, color, language, religion, political or other opinion, national, ethnic or social origin, property, birth or other status;

3. Not use language or behavior towards men, women or children/learners that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate;

4. carry out his/her duties competently and diligently;

5. comply with this Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Personnel and any other person;

6. maintain a safe working environment including by: a. ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health;

b. wearing required personal protective equipment;

c. using appropriate measures relating to chemical, physical and biological substances and agents; and

d. following applicable emergency operating procedures.

7. report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and danger to his/her life or health;

8. treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children;

9. not engage in any form of sexual harassment including unwelcome sexual advances, requests for sexual favors, and other unwanted verbal or physical conduct of a sexual nature with other Contractor's or Employer's Personnel;

10. Not participate in sexual activity with children/learners—including grooming or through digital media. Mistaken belief regarding the age of a child and consent from the child is not a defense;

11. Not exchange money, employment, goods, or services for sex, with community members including sexual favors or other forms of humiliating, degrading or exploitative behavior;

12. Attend trainings related to HIV and AIDS, SAE/SH, occupational health and any other relevant courses on safety as requested by my employer;

13. Report to the relevant committee any situation where I may have concerns or suspicions regarding acts of misconduct by a fellow worker, whether in my company or not, or any breaches of this code of conduct provided it is done in good faith;

14. Regarding children (under the age of 18):

a) Refrain from hiring children for domestic or other labor, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.

b) Comply with all relevant local legislation, including labor laws in relation to child labor.

15. Refrain from any form of theft for assets and facilities including from surrounding communities.

16. Remain in designated working area during working hours;

17. Refrain from possession of alcohol and illegal drugs and other controlled substances in the workplace and being under influence of these substances on the job and during workings hours;

18. Follow prescribed environmental occupation health and safety standards;

19. Channel grievances through the established grievance redress mechanism.

I understand that the onus is on me to use common sense and avoid actions or behaviors that could be construed as misconduct or breach this code of conduct. I acknowledge that I have read and understand this Code of Conduct, and the implications have been explained with regard to sanctions on-going employment should I not comply.

Name:_____

Signature:_____

Date: _____

For the Employer/Contractor

Name:_____

Signature:_____

Date: _____

ANNEXURE-B

TRAINING PLAN

The Contractor shall include a training plan within the CESMP which details the program for the delivery of training, demonstrating the training shall be carried out initially at the induction of staff and repeated intermittently throughout the project, to cover the subjects included in the following table. Some briefings/ sessions will be conducted daily and some with the induction of new staff and the others at the start of the project and quarterly basis.

S. No	List of Topics/Training	Contents	Timeline	Frequency	Staff
1.	Handling, use, and disposal of hazardous material	• Type of Hazardous Material and waste • Routes of Entry • Safety Labelling • Use of Safety Data Sheet • Goal and Objectives • Actions to Do and Preventive Measures • How to avoid Injuries	Throughout the project	Daily Basis	All construction staffs
2.	Waste Management	• Introduction to types and waste • Solid Waste and its types • Effects of Solid waste • Waste Management Concept Collection, storage, and disposal techniques • What to do and what no to do	Throughout the project	Weekly Basis	All construction staff working on regulating structures
3.	Efficient & safe driving practices, including road & vehicle restrictions	• Introduction • Causes of Road Accidents • Driving hazards • Road Journey • Vehicle inspection • Health Condition	Throughout the project	Weekly Basis	All staff
4.	Actions to be taken in the event of major or minor pollution event on land/Pollution Prevention	• Type of pollution and its causes • How to Avoid pollution • What to do in case of an event • Reduction Techniques • Benefits	Throughout the project	Weekly Basis	All Staff

S. No	List of Topics/Training	Contents	Timeline	Frequency	Staff
5.	Health & Safety: Safe way to work & hazard awareness	• Objectives • Types of Hazards • Work at height procedures • Moving of machinery • Use of PPEs • Housekeeping • Hazards control	Throughout the project	Weekly Basis	All construction staff
6.	Health & Safety: Safe use of plant & equipment	• Use of Plant procedures • Competency and training • Machine guarding • Dismantling of equipment • Daily maintenance • Safe operation • Intended use of equipment's	Throughout the project	Weekly Basis	Operators of plant & equipment
7.	Health & Safety: Working at height	• Access and Egress, Loading Places • Ladders • Landing Places • Openings, Corners, Breaks, Edges, and Joisting • Work over Water • Safety Nets, Belts and Harnesses	Throughout the project	Monthly	All construction staff
8.	Health & Safety: Working near/on water	• Contamination and biological/chemical hazards • Weather conditions • Hypothermia and hyperthermia • Unstable surface • Electrical hazards • Lone working • Accidental immersion	Throughout the project	Monthly	All construction staff
9.	Health & Safety: Use of PPE	• Common Type of PPEs • Use of PPEs • Benefits • Workplace requirement of PPEs • Care and Maintenance of PPEs • When PPE is necessary • Limitations of the PPE	Throughout the project	Daily Basis	All construction staff

S. No	List of Topics/Training	Contents	Timeline	Frequency	Staff
10.	Emergency procedures and evacuation	• Types of emergency • What is an Emergency plan • What is an individual role in case of emergency • Supervising Rescue Operations • Emergency reporting procedures • Means of egress	Throughout the project	Weekly Basis	All staff
11.	Fire fighting	• Objectives • How fire starts • Use of fire extinguishers • Type of Fire extinguishers • Fire safety inspection • Competency required • Action in case of fire • Do's and Don'ts	Throughout the project	Weekly Basis & Monthly drills	All staff
12.	Site inductions, including requirements under the CESMP & details of environmentally sensitive areas of the site	• Purpose of induction training • Why health and safety is important • What is CESMP • What is the requirement of CESMP • Duty of care and responsibility • Your responsibility and our responsibility • Protection of Environment • What is an ecosystem • What is ecology • Identification of key species	Throughout the project	Monthly	All staff
13.	Culturally sensitive awareness raising on HIV/AIDS and the spread of sexually transmitted diseases. Awareness-raising on risks, prevention and available treatment of vector- borne	• Valuing cultural difference • Avoiding habits in other areas during migration • What are sexually transmitted diseases • Type of infection • Prevention • Strategies for controlling vector-borne diseases • Type of vector-borne diseases • Treatment procedures	Throughout the project	Quarterly	

S. No	List of Topics/Training	Contents	Timeline	Frequency	Staff
	Diseases, Cultural sensitivities of the local population				
14	Culturally sensitive awareness raising on GBV/SEA/SH	• Definition and types of GBV, SEA, and SH • Causes, risks, and impacts on individuals and communities • Respect for local culture, norms, and values • Appropriate behaviour and valuing cultural differences • Rights of women, children, and vulnerable groups • Code of Conduct: acceptable and prohibited behaviours • Zero tolerance for GBV, SEA, and SH • Prevention measures and safe workplace practices • Awareness on HIV/AIDS and sexually transmitted diseases (STDs) • Basic knowledge of vector-borne diseases and prevention • Reporting mechanisms (GRM) and confidentiality • Survivor support services (medical, psychosocial, legal)	Throughout the project	Quarterly	All staff/Community

ANNEXURE-C

ENVIRONMENTAL AND SOCIAL MONITORING CHECKLIST

Project Name: _____ Activities Inspected_____

Location _____ Weather Condition_____

Date: _____ Time: _____

Sr. No	Performance Indicators	Yes	No	N/A	Des.	Remarks
1.	Heavy Dust					
2.	Excessive noise or vibration					
3.	Water sprinkling at the construction and disposal sites					
4.	Discharge of wastewater to nearby water course/water body					
5.	Any spillage of fuel/oil observed					
6.	Dumping of solid waste at designated Site					
7.	Dumping of construction waste/spoil at designated Site					
8.	Protection of Flora/Fauna					
9.	Availability of Drinking water					
10.	Site housekeeping					
11.	Warning signs displayed near construction zone.					
12.	Use of PPEs by the beneficiaries and workers					
13.	Any incident/accident (use separate proforma)					
14.	Any GBV/SEA and privacy related complaints					
15.	Availability of first aid boxes at site					
16.	Any land ownership provided to women beneficiaries					
17.	Any involuntary resettlement under the project					
18.	Proportion of local labor in the project					
19.	Child/Force Labor					
20.	Is the GRM properly in place					
21.	Regular monitoring of complaint register is in practice					
22.	Any exclusion, specially to women, disadvantaged groups and marginalized people from project forums					
23.	Any elite capture related grievance					
24.	Participation of women, children, and vulnerable groups in consultations and project activities					
25.	Any Unusual Conditions (e.g., heavy rain, extreme weather)					
26.	Chance finds during construction					
Note If any:						

Filled By: _____ **Signature** **Name:** _____ **Position:**	**Extra Note if needed:**

Note: mention the location and extent of degradation of exceeding indicators in description column or in a note if necessary.

ANNEXURE: D

ENVIRONMENTAL CODE OF PRACTICES (ECOPS)

The basic objective of the ESMP exercise is to minimize the adverse impacts of project interventions on the environment of the sub-project areas. The following Environmental Code of Practices (ECoPs) provides the method by which the Contractor should comply with the mitigations contained in this ESMP. The objectives of these ECoPs are to provide the best guideline practices on environmental, health, and safety during the operation phase of the sub-project.

The following ECoPs be followed best practices:

- Water resource management
- Drainage
- Waste Management
- Management of fuel and hazardous material
- Management of soil quality
- Management of air quality
- Management of Noise and vibration
- Protection of flora
- Protection of Fauna
- Health and Safety
- Traffic Management
- Management of Contractor Camp
- Water Resource Management

ECoP for Water Resource Management

Activity	Environmental Impact	Environmental Management Guideline
Drinking water	Groundwater at shallow depths might be contaminated and hence not suitable for drinking purposes.	Tube wells will be installed with due regard to the surface environment, protection of groundwater from surface contaminants, and protection of aquifer cross-contamination. Control the quality of the groundwater to be used for drinking water on the basis of NEQS standards for drinking water. Safe and sustainable discharges are to be ascertained prior to the selection of pumps. All tube wells, test holes, monitoring wells that are no longer in use or needed shall be properly decommissioned
Construction activities in water bodies	Construction works in the water bodies will increase sediment and contaminant loading, and affect the habitat of fish and other aquatic biology.	Monitor the water quality in the runoff from the site, and improve work practices as necessary. Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways, stormwater systems or underground water tables. Use environment-friendly and nontoxic slurry during the construction of piles to discharge into the river. Reduce infiltration of contaminated drainage through stormwater management design. Do not discharge cement and water curing used for cement concrete directly into watercourses and drainage inlets.
Discharge from construction sites	During construction both surface and groundwater quality may be deteriorated due to construction activities in the river,	Install temporary sediment basins, where appropriate, to capture sediment-laden runoff from the site. Divert runoff from undisturbed areas around the construction site Stockpile materials away from drainage lines Prevent all solid and liquid wastes entering waterways by collecting solid waste, oils, chemicals, Bhitumen spray waste and

Activity	Environmental Impact	Environmental Management Guideline
	sewerages from construction sites and work camps. The construction works will modify ground cover and topography changing the surface water drainage patterns, including infiltration and storage of stormwater. The change in the hydrological regime leads to increased rates of runoff and in sediment and contaminant loading, increased flooding, groundwater contamination, and affect the habitat of fish and other aquatic biology.	wastewaters from brick, concrete, and asphalt cutting where possible and transport to an approved waste disposal site or recycling depot. Wash out ready-mix concrete agitators and concrete handling equipment at washing facilities off-site or into approved bunded areas on site. Ensure that tires of construction vehicles are cleaned in the washing bay (constructed at the entrance of the construction site) to remove the mud from the wheels. This should be done in every exit of each construction vehicle to ensure the local roads are kept clean.
Soil erosion and siltation	Soil erosion and dust from the material stockpiles will increase the sediment and contaminant loading of surface water bodies.	Stabilize the cleared areas not used for construction activities with vegetation or appropriate surface water treatments as soon as practicable following earthwork to minimize erosion. Ensure that roads used by construction vehicles are swept regularly to remove sediment. Water the material stockpiles (where appropriate), access roads and bare soils on an as-required basis to minimize dust. Increase the watering frequency during periods of high risk (e.g. High winds)
Handling, use, storage & disposal of hazardous material and waste	Water pollution from the storage, handling, and disposal of hazardous materials and general construction waste, and accidental spillage	Follow the management guidelines proposed in ECoPs for Waste Management and Management of Fuels & Hazardous Substances. Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter a watercourse or underground water tables

ECoP for Drainage

Activity	Environmental Impact	Environmental Management Guideline
Excavation and earthworks, and construction yards	Lack of proper drainage for rainwater, surface water, liquid waste or wastewater owing to the construction activities harms the environment in terms of water and soil contamination and mosquito growth.	Provide alternative drainage for rainwater if the construction works/earth-fillings cut the established drainage line. Rehabilitate road drainage structures immediately if damaged by contractors' road transports. Build new drainage lines as appropriate and required for wastewater from the construction yards connecting to the available nearby recipient water bodies. Ensure wastewater quality conforms to the relevant standards before being discharged into recipient water bodies. Ensure the internal roads/hard surfaces in the construction yards/construction camps have adequate stormwater drainage to accommodate high runoff during a downpour and that there will be no stagnant water remaining in the area at the end of the downpour. Construct wide drains instead of deep drains to avoid sand deposition in the drains that will require frequent cleaning. Protect natural slopes of drainage channels to ensure adequate stormwater drains. Regularly inspect and maintain all drainage channels to assess and alleviate any drainage congestion problem. Reduce infiltration of contaminated drainage through stormwater management design

ECoP for Waste Management

Activity	Environmental Impact	Environmental Management Guideline
Generation of hazardous wastes	Safety, health and environmental hazards due to improper waste Management practices	Collect chemical wastes in 200-liter drums (or similar sealed containers), appropriately labeled for safe transport to an approved chemical waste depot. Store, transport and handle all chemicals, avoiding potential environmental pollution. Collect hydrocarbon wastes, including lubricating oils, for safe transport off-site for reuse, recycling, treatment or disposal at approved locations. Construct concrete or other impermeable flooring to prevent seepage in case of spills. Store all hazardous wastes appropriately in Bunded areas away from watercourses. Make available Material Safety Data Sheets (MSDS) for hazardous materials on-site during construction.
General waste	Soil, surface water & groundwater pollution from the improper disposal of wastes.	Request suppliers to minimize packaging where practicable. Place a high emphasis on good housekeeping practice. Collect and transport non-hazardous wastes to all the approved disposal sites. Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process. Develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food waste, etc.) prior to commencing of construction and submit to Supervisory consultant for approval. Organize disposal of all wastes generated during construction in an environmentally acceptable manner. This will include consideration of the nature and location of the disposal site, so as to cause less environmental impact. Maintain all construction sites in a clean, tidy and safe condition and provide and maintain appropriate facilities for the temporary storage of all wastes before transportation and final disposal. Provide refuse containers at each worksite. Minimize the production of waste materials through the '3 Rs' (Reduce, Recycle and Reuse) approach. Segregate and reuse or recycle all the waste.

ECoP for Management of Fuels & Hazardous Substances

Activity	Environmental Impact	Environmental Management Guideline
Fuels and hazardous goods	Materials used in construction have the potential to be a source of contamination. Improper storage and handling of fuels, lubricants, chemicals and hazardous goods/materials on- site, and potential spills from these goods may harm the environment or health of construction workers.	Put containers and drums in temporary storage in clearly marked areas, where they will not be run over by vehicles or heavy machinery. The area should preferably slope or drain to a safe collection area in the event of a spill. Train the relevant construction personnel in the handling of fuels and spill/pollution control procedures. Store dangerous goods in bunded areas on a top of a sealed plastic sheet or other impervious material away from watercourses. Refuelling should occur only within bunded areas. Make available MSDS for chemicals and dangerous goods on-site. Transport waste of dangerous goods, which cannot be recycled, to a designated & approved disposal site. Prepare pollution control procedures and submit the plan to the Engineer. Put containers and drums in permanent storage areas on an impermeable floor that slopes in a safe collection area in the event of a spill or leak.

ECoP for Management of Soil Quality

Activity	Environmental Impact	Environmental Management Guideline
Construction material stock piles	Erosion from construction material stockpiles may contaminate the soils	Protect the toe of all stockpiles, where erosion is likely to occur, protect with silt fences, straw bales or bunds
Storage of hazardous and toxic chemicals	Spillage of hazardous and toxic chemicals will contaminate the soils	Strictly manage the waste management plans proposed and the storage of materials. Construct appropriate spill contaminant facilities for all fuel storage areas. Establish and maintain hazardous materials, a register detailing the location and quantities of hazardous substances, including storage, use, and disposal. Train personnel and implement safe work practices for minimizing the risk of spillage. Identify the cause of contamination, if it is reported, and contain the area of contamination. The impact may be contained by isolating the source or implementing controls around the affected site. Remediate the contaminated land using the most appropriate available method

ECoP for Air Quality

Activity	Environmental Impact	Environmental Management Guideline
Construction machinery	Air quality can be adversely affected by emissions from machinery and the combustion of fuels.	Machinery causing excess pollution (e.g. visible smoke) will be banned from construction sites. Fit machinery with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition. Focus special attention on containing the emissions from generators. Service all equipment regularly to minimize emissions

ECoP for Noise & Vibration

Activity	Environmental Impact	Environmental Management Guideline
		Take all precautionary measures when handling and storing fuels and lubricants, avoiding environmental pollution. Avoid the use of material with greater potential for contamination by substituting them with more environmentally friendly material. Provide absorbent and containment material (e.g. Absorbent mats) where hazardous material is used and stored and train personnel in their correct use. Provide protective clothing, safety boots, helmets, masks, gloves, goggles, to the construction personnel, appropriate to materials in use. Make sure all containers, drums, and tanks that are used for storage are in good condition and label with an expiry date. Any container, drum, or tank that is dented, cracked, or rusted might eventually leak. Check for leakage regularly to identify potential problems before they occur. Store hazardous materials above flood plain level.
Construction activities	Dust generation from construction sites, material stockpiles, and access roads is a nuisance in the environment and can be a health hazard.	Minimize the extent and period of exposure of the bare surfaces Reschedule earthwork activities or vegetation clearing activities, were practical, if necessary, to avoid periods of high wind and if visible dust is blowing off-site Water the material stockpiles & access roads on an as-required basis to minimize the production of dust. Increase the watering frequency during periods of high risk (e.g. High winds). Restore disturbed areas as soon as practicable by vegetation/grass-turfing
Construction activity	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	Notify affected people if/when noisy activities will be undertaken Plan activities on-site and deliveries to and from site to minimize the impact. Monitor and analyze noise and vibration results and adjust construction practices as required. Notify adjacent residents prior to any typical noise event outside of daylight hours. Educate the operators of construction equipment on potential noise problems and the techniques to minimize noise emissions Employ the best available work practices on-site to minimize occupational noise levels. Avoid undertaking the noisiest activities at night near the residential areas
Construction vehicular traffic	Increased noise levels in the project area	Maintain all vehicles in accordance with manufactures maintenance procedures to ensure good working order. Make sure all drivers will comply with the traffic codes concerning the maximum speed limit, driving hours, etc.
Construction machinery	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	Appropriately site all noise-generating activities to avoid noise pollution to local residents. Install acoustic enclosures around generators to reduce noise levels. Fit high-efficiency mufflers to appropriate construction equipment. Use the quietest available plant and equipment. Modify equipment to reduce noise (for example, noise control kits, the lining of truck trays). Maintain all vehicles in accordance with manufactures maintenance procedures to ensure good working order

ECoP for Flora

Activity	Environmental Impact	Environmental Management Guideline
Vegetation clearance	Local flora is important to provide shelters for the fauna, offer fruits and/or timber/firewood and protect soil erosion. Such as damage to flora has a wide range of adverse Environmental impacts.	Clear only the vegetation that needs to be cleared in accordance with the designs. These measures are applicable to both the construction areas as well as for any associated activities such as sites for stockpiles, disposal of fill and construction of diversion roads, etc. Do not burn cleared vegetation – where feasible, chip or mulch and reuse it for the rehabilitation of affected areas, temporary access tracks or landscaping. Mulch provides a seed source, can limit embankment erosion, retains soil moisture and nutrients, and encourages re-growth and protection from weeds. Reduce disturbance to surrounding vegetation Use appropriate type and minimum size of the machine to avoid disturbance to adjacent vegetation. Get approval from the supervision consultant for the clearance of vegetation. Make selective and careful pruning of trees where possible to reduce the need for tree removal. Control noxious weeds by disposing of at a designated dump site or burn on site. Provide adequate knowledge to the workers regarding nature protection and the need to avoid felling trees during construction Supply appropriate fuel in the work camps to prevent fuelwood collection. Return topsoil and mulched vegetation (in areas of native vegetation) to approximately the same area of the roadside it came from. Avoid work within the drip-line of trees to prevent damage to the tree roots and compacting the soil.

ECoP for Fauna

Activity	Environmental Impact	Environmental Management Guideline
Construction activities	The location of construction activities can result in the loss of wildlife habitat and habitat quality. Impact on migratory birds, habitat and active Nests	The Contractor is not permitted to destruct active nests or eggs of migratory birds. Minimize the release of oil, oil wastes or any other substances harmful to migratory birds to any waters or areas frequented by migratory birds.
Construction camps	Illegal poaching	Provide adequate knowledge to the workers regarding the protection of flora and fauna, and relevant government regulations and punishments for illegal poaching.
Vegetation clearance	Clearance of vegetation may impact shelter, feeding and/or breeding and/or Physical Destruction and severing of habitat areas	Restrict the tree removal to the minimum required. Retain tree hollows on-site, where appropriate. Leave dead trees where possible as habitat for fauna. Fell the hollow-bearing trees in a manner that reduces the potential for fauna mortality. After felling, hollow trees will remain unmoved overnight to allow animals to move of their own accord.

Breeding Season & Nesting	During earth works and vegetation clearance	The contractor environment officer shall survey the construction sites to eliminate the potential risk of any incident to any terrestrial, reptilian, mammals, fauna species prior to the construction works. On identification of any such nest (on ground or trees), the contractor shall immediately cease works in the area and inform the Engineer and PMU. The contractor shall erect a fence within 50ft of the nest and prohibit any works within this area until approved by the Engineer who shall arrange for an ecologist from SUPERVISORY CONULTANT to visit the site and assess the impact. The contractor shall not fell a tree which houses an active nest or eggs. The breeding season of the following faunal species that are Vulnerable, Near Threatened and Protected are identified below: Avi-Fauna • Greter Spotted Eagle *(Aquila clanga)*-April and May • Houbara Bustard (*Chlamydotis undulata*)-March & October • Black-tailed Godwit (*Limosa limosa)*-March to August **Reptiles** • Bengal Monitor (Varanus bengalensis)-June to September • Tortoise Afghan *(Testudo horsfieldii*)-May or June **Mammals** • Common Hill fox (Vulpes vulpes)- December or February • Chinkara (Gazella bennetti-August to Ocotober & March *to April*
General construction works	Construction works may pose health and safety risks to the construction workers and site visitors leading to severe injuries and deaths. The population in the proximity of the construction site and the construction workers will be exposed to a number of) biophysical health risk factors, (e.g. noise, dust, chemicals, construction material, solid waste, wastewater, vector transmitted diseases, etc), i) risk factors resulting from human behavior (e.g. STD, HIV, etc) and (iii) Road accidents	Implement suitable safety standards for all workers and site visitors, which should not be less than those laid down on the international standards (e.g. International Labor Office guideline on 'Safety and Health in Construction; World Bank Group's 'Environmental Health and Safety Guidelines') and contractor's own national standards or statutory regulations, in addition to complying with the national acts and rules of the Government of Pakistan. Provide the workers with a safe and healthy work environment, taking into account inherent risks in its particular construction activity and specific classes of hazards in the work areas, Provide personal protection equipment (PPE) for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields, and ear protection. Maintain the PPE properly by cleaning dirty, and replacing damaged, PPE. Safety procedures include the provision of information, training and protective clothing to workers involved in hazardous operations and proper performance of their job. Appoint an environment, health, and safety manager to look after the health and safety of the workers. Inform the local authorities responsible for health, religious and security before the commencement of civil works and establishment of construction camps so as to maintain effective surveillance over public health, social and

	from construction traffic.	security matters. The Contractor shall follow the ECoPs presented in the following tables to reduce health risks to the construction workers and nearby community

ECoP for Traffic Management

Activity	Environmental Impact	Environmental Management Guideline
Construction vehicular traffic	Increased traffic use of roads by construction vehicles will affect the movement of normal road traffics and the safety of the road- users. Accidents and spillage of fuels and chemicals	Restrict truck deliveries, where practicable, today time working hours. Restrict the transport of oversize loads. Operate road traffics/transport vehicles, if possible, at non-peak periods to minimize traffic disruptions. Enforce on-site speed limit. Prepare and submit a traffic management plan to SUPERVISORY CONULTANT for their approval. Include measures in the traffic management plan to ensure uninterrupted traffic movement during construction: detailed drawings of traffic arrangements showing all detours, temporary road, temporary diversions, necessary barricades, warning signs/lights, road signs, etc. Provide signs at strategic locations of the roads complying with the schedules of signs contained in the Pakistani Traffic Regulations. Install and maintain a display board at each important road intersection on the roads to be used during construction, which shall clearly show the following information in Urdu:

ECoP for Camp Management

Activity	Environmental Impact	Environmental Management Guideline
Safety	Inadequate safety facilities at the construction camps may create security	Provide appropriate security personnel (police /home guard or private security guards) and enclosures to prevent unauthorized entry into the camp area.
	problems and fire hazards	Maintain register to keep track of personnel present in the camp at any given time. Encourage the use of flameproof material for the construction of the labor housing/site office. Ensure that these houses/rooms are of sound construction and capable of withstanding storms/cyclones. Provide the appropriate type of firefighting equipment's suitable for the construction camps. Display emergency contact numbers clearly and prominently in strategic places in camps. Communicate the roles and responsibilities of labourers in case of an emergency in the monthly meetings with contractors.
Construction Camp Facilities	Lack of proper infrastructure facilities, such as housing, water supply, and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards.	Adequate housing for all workers. Safe and reliable water supply. Water supply from tube wells that meets the national standards. Hygienic sanitary facilities and sewerage systems. Provide separate latrines and bathing places for males and females with total isolation by a wall or by location. Female toilets should be clearly marked in a language understood by the persons using them to avoid miscommunication. Treatment facilities for sewerage of toilet and domestic wastes Stormwater drainage facilities – shallow v drains should be provided on both sides of any camp roads to drain off stormwater. Pave the internal roads of at least haring-bond bricks to suppress dust and to work against a possible muddy surface during monsoon. Provide in-house community/common entertainment facilities. The dependence of local entertainment outlets by construction staff is to be discouraged/prohibited to the extent possible.
Disposal of waste	Management of wastes is crucial to minimize impacts on the environment, such as soil or water pollution.	Ensure proper collection and disposal of solid wastes within the construction camps. Encourage waste separation by source; organic wastes in one container and inorganic wastes in another container at the household level. Store inorganic wastes in a safe place within the household and clear organic wastes on a daily basis to waste collectors. Establish waste collection, transportation and disposal systems supported by adequate manpower and equipment/vehicles. Dispose of organic wastes in a designated safe place on a daily basis. At the end of the day cover the organic wastes with a thin layer of sand so that flies, mosquitoes, dogs, cats, rats, etc. are not attracted. Where waste is disposed of in a pit take care to protect groundwater from contamination by leachate formed due to decomposition. Cover the bed of the pit with an impervious layer of materials (clay, thin concrete) to protect groundwater from contamination. Locate the garbage pit/waste disposal site min 500 m away from the residence so that peoples are not disturbed with the odor likely to be produced from anaerobic decomposition of wastes at the waste dumping places. Encompass the waste dumping place with fencing to prevent access to children. Do not establish site-specific landfill sites. All solid waste will be collected and removed from the work camps and disposed of in the approval of waste disposal sites.

ANNEXURE: E

CHANCE FIND PROCEDURE FOR CULTURAL HERITAGE FINDS

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 Supervision Consultant to DG Directorate General of Archaeology, Blochistan and Project Director of PMU/PIU, 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 PIU 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.

ANNEXURE: F

FORMAT OF A MONTHLY MONITORING REPORT

Scope of Works

Provide a summary regarding the engineering activities as given in design documents.

Summary of non-compliances

This section summaries the findings of the Environmental Management Plan (ESMP) compliance monitoring completed by the supervisory consultant under this project.

Summary of Action Required

Summary of non-compliances

S. No	Non-Compliances	Actions Required	ending Since	Status of Previous Month Non-compliances
1	*Include Particular Non-Compliance Observed*	*Include Action Require, as per ESMP*	*Include Number of Months*	*Include so far progress made from the previous month*
	------	-----	-----	------

Historical Review of Non-Compliances

So far, the progress made and issues resolved by the contractor include a graph of the past three months. (Percentage Non-Compliance evaluated from monthly monitoring checklist)

Non-Compliances

Include specific social, Environmental Health and Safety Non-Compliances observed during the monitoring month

Provide Specific Non-Compliance (With Status)

- Provide details
- Provide Photographs

Action Required

- Provide a list of action required

ANNEXURE:G

CERTIFICATE OF ENVIRONMENTAL MONITORING LAB

GREEN **GRES-JV-SES** SES

Reference No: GRES-SES-JV/IFRAP/19 **Date:**29th October, 2025

FOR INTEGRATED FLOOD RESILIENCE AND ADPATION PROJECT (IFRAP)

This is to certify that the Green Environmental Services Private Limited (GRES) JV Sustainable Environmental Services (SES) Karachi has been conducted environmental baseline testing studies for the different schemes regarding Environmental and Social Management Plan & Checklist. The samples were collected in October 2025. The scope of Monitoring Activities by GRES-JV-SES follows:

Baseline Sampling Ambient Air, Noise, Surface Water and Ground Water					
S. No	Project Site	Ambient Air	Noise	Surface Water	Ground Water
1	Restoration and Strengthening of Flood Embankment Main Rabi Canal-1, Naseerabad Restoration and Strengthening of Flood Embankment Main Rabi Canal-2, Naseerabad	01	01	01	01

The Baseline Environmental Monitoring sampling as per above mentioned scope has been conducted by GRES JV SES as per requirement of the project. A comprehensive report of test conducted along with analysis and conclusion has been submitted to CAMEOS Consultant, Quetta Office.

Name: Zafarullah Channa
(Party of the first Part)

Signature: _____

Name: Zeeshan Khan
(Party of the second Part)

Signature: _____

HEAD OFFICE
Plot No: #233, Street No: #6 Sector 8-C, Hajra Masjid Muhammad Ali Gouth, Hazrat Bilal Colony, Korangi, Korangi Town, Karachi.
Cell: 03327983594, 03302744735, Email:
ges.karachioffice@gmail.com

NEW HEAD OFFICE-LAB
Plot No: SC-46, Block Commercial Sector 31/D P&T Society Korangi, Karachi.
Cell: 03332699016, 03462225261, Email:
info@sespaklab.com,

ANNEXURE: H

E&S RISK SCREENING TABLE (as per ESS1 & ESS4)

(This should be included as a technical annex to the Preliminary Site Assessment Report)
Purpose: To screen sub-projects for potential environmental and social (E&S) risks and determine the level of assessment required during detailed design.

Preliminary Site Assessment Report

No.	Sub-Project Name	District	Type	Key Environmental Risks	Key Social Risks	Proposed Mitigation / Management Measures	Preliminary Risk Category (Low / Moderate / Substantial / High)
1	Restoration of Main Rabi Canal Flood Embankment	PKG-IV – Naseerabad District:	Flood Protection	Sediment inflow, erosion, disposal of silt	Temporary land use for construction, community safety	Design silt trap, use borrow area rehabilitation plan, safety signage	Moderate
				Earth bund construction	Access disturbance for farmers	Timing of works, maintain access paths	Low
				Waste generation		Water sprinkling, gabion mesh coating	Low
				Dust emissions	Labor influx, GBV risk	Controlled spoil disposal, labor code of conduct	Low
				PPEs		Community awareness & fencing	Moderate

Summary:

- No major irreversible environmental or social impacts anticipated.
- All identified risks are manageable through CESMPs during design.
- PIU to coordinate with Environmental and Social Specialists for final risk classification in the next phase

ANNEXURE: I

LAB TEST REPORTS (WATER QUALITY, AIR QUALITY & NOISE RECORD)

Sustainable Environmental Services | SES

Analysis Report Ref # SES/Env/OCT/25/2893/3784 B Date:13-OCT2025

Description:

Job Location:	HUB	Testing Instrument	24 Hours Air Monitoring Station
Job Performed By:	Mr. Mohsin	Job Date :	08-10-2025 to 09-10-2025
Monitoring Duration:	(10:00 AM To 09:00 AM) 24 Hrs.		
Project:	INTEGRATED FLOOD RESILIENCE AND ADPATION DEVELOPMENT PROJECT (IFRAP)		
Site Location:	Restoration and Strengthening of Flood Embankment Main Rabi Canal-I(PACKAGE-IV)		
Client Name :	CAMEOS CONSULTANT, QUETTA OFFICE		

Ambient Air Quality Monitoring

Sr.	Measuring Parameters	Unit	WHO Limit	NEQS & BEQS Limits	Average Test Result	Remarks
1.	Oxide Of Nitrogen as (NO)	µg/m³	-	40 (24 hrs.)	12.9	WL
2.	Oxide Of Nitrogen as (NO_2)	µg/m³	25(24 hrs.)	80 (24 hrs.)	30.8	WL
3.	Sulphur Dioxide (SO_2)	µg/m³	40(24 hrs.)	120 (24 hrs.)	5.3	WL
4.	Carbon Monoxide (CO)	mg/m³	4(24 hrs.)	5 (08 hrs.)	0.0416	WL
5.	Particulate Matter (PM 2.5)	µg/m³	15(24 hrs.)	35 (24 hrs.)	25.9	WL
6.	Particulate Matter (PM 10)	µg/m³	45(24 hrs.)	150 (24 hrs.)	78.8	WL
7.	SPM	µg/m³	-	500 (24 hrs.)	107.0	WL
8.	Ozone (O_3)	µg/m³	60(Peak Season)	130 (01 hr.)	5	WL

Note:
BEQS=Baluchistan Environmental Quality Standards
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported data in future
This report is not valid for Court evidence/ Judicial knowledge
The measurement results based on the time of monitoring
WL– Within Limit

Field Analyst: _____

Chief Chemist: Kashif Ahmed

ASCERT ISO 45001:2018 ASCERT ISO 14001:2015 ASCERT ISO 9001:2015

New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
Mob: +92(0)346-2225261,0333-2699016 Tel # 02135121125 E-mail: info@sespaklab.com Web: www.sespaklab.com

Sustainable Environmental Services | SES

Analysis Report — Ref # SES/Env/OCT/25/2893/3784_D — Date: 13-OCT2025

Description:

Quantity of sample	1.0 Liter	Sampling Methodology	Grab	Job Date	08-10-2025
Analysis Type	Chemical Analysis		Sampling Location		Project Site
Project:	Integrated Flood Resilience And Adpation Development Project (IFRAP)				
Site Location:	Restoration and Strengthening of Flood Embankment Main Rabi Canal-1(Package -IV)				
Client Name :	CAMEOS CONSULTANT, QUETTA OFFICE				

Surface Water Report

S #	Parameters	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Result	Remarks
01	Total Bacteria Count	TBC (count/ml)	Total Viable Count	----------	----------	----------	04	-
02	Total Coliform	TC (count/ml)	APHA 922 B	0/100 ml	0/100 ml	0/100 ml	221	OL
03	E-Coli	EC(count/ml)	Total Viable Count	0/100 ml	0/100 ml	0/100 ml	79	OL
04	Facial Coli	FC (count/ml)	APHA 922 B	0/100 ml	0/100 ml	0/100 ml	149	OL
05	Turbidity	NTU	HACH Turbidity meter	<5	<15	<15	< 0.09	WL
06	Taste	Taste	Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-obj	WL
07	Odour	Odor	Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-ojj	WL
08	Colour	TCU	Pt-Co method	≤ 15 TCU	≤ 15 TCU	≤ 15 TCU	< 4	WL
09	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	-	-	-	ND	WL
10	Residual chlorine	Cl_2 (mg/L)	HACH Method 8167	0.2-0.5	-	0.2-0.5	0.3	WL
11	pH @ 25 °C	PH	ASTM D-1293	6.5 to 8.5	6.5 to 8.5	6.5 to 8.5	8.61	WL
12	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	< 1000	< 1000	< 1000	343	WL
13	Total Hardness	As COCO3(mg/L)	APHA 2340-C	< 500	-	< 500	91	WL
14	Fluoride	F^{-1} (mg/L)	APHA 4500-F^{-1}	≤1.5	1.5	≤ 1.5	0.73	WL
15	Chloride	Cl^{-1} (mg/L)	APHA 4500-Cl^{-1}	< 250	250	< 250	129	WL
16	Cyanide	CN^{-1}(mg/L)	HACH Method 8027	≤ 0.05	0.07	≤ 0.05	ND	WL
17	Nitrate	NO_3^{-1} (mg/L)	HACH Method 8192	≤ 50	50	≤ 50	0.31	WL
18	Nitrite	NO_2^{-1} (mg/L)	APHA 4500-NO_2^{-1}-B	≤ 3.0(P)	3	≤ 3.0(P)	0.05	WL
19	Antimony	Sb (mg/L)	ASTM D-3697	≤ 0.005	0.02	≤ 0.005	ND	WL
20	Aluminum	Al(mg/L)	ASTM D-857	≤ 0.2	0.2	≤ 0.2	0.11	WL
21	Arsenic	As (mg/L)	ASTM D-2972	≤ 0.05	0.01	≤ 0.05	ND	WL
22	Boron	B (mg/L)	ASTM D-3082	0.3	0.3	0.3	ND	WL
23	Barium	Ba(mg/L)	ASTM D-4382	0.7	0.7	0.7	0.008	WL
24	Chromium Total	Cr(mg/L)	ASTM D-1687	≤ 0.05	0.05	≤ 0.05	ND	WL
25	Copper	Cu (mg/L)	ASTM D-1688	2	2	2	<0.08	WL
26	Cadmium	Cd(mg/L)	ASTM D-3557	0.01	0.003	0.01	ND	WL
27	Lead	Pb(mg/L)	ASTM D-3559	≤ 0.05	0.01	≤ 0.05	ND	WL
28	Manganese	Mn(mg/L)	ASTM D-858	≤ 0.5	0.5	≤ 0.5	ND	WL
29	Mercury	Hg (mg/L)	ASTM D-3223	≤ 0.001	0.001	≤ 0.001	ND	WL
30	Nickel	Ni(mg/L)	ASTM D-3866	≤ 0.02	0.02	≤ 0.05	ND	WL
31	Selenium	Se(mg/L)	ASTM D-3858	0.01	0.01	0.01	ND	WL
32	Zinc	Zn (mg/L)	ASTM D-1691	5	3	5	0.15	WL

Note:
BEQS=Baluchistan Environmental Quality Standards
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported data
This report is not valid for Court evidence/ Judicial
The measurement results based on the time of moni
WL= Within Limit

Field Analyst: _____ Mr. Mohsin

Chief Chemist: _____ Kashif

ASCERT ISO 45001:2018 ASCERT ISO 14001:2015 ISO 9001

New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
Mob: +92(0)346-2225261,0333-2699016 Tel # 02135121125 E-mail: info@sespaklab.com Web: www.sespaklab.com

Sustainable Environmental Services | SES

Analysis Report Ref # SES/Env/OCT/25/2893/3784 C Date: 13-OCT2025

Description:

Job Location:	HUB	**Testing Instrument:**	Noise Meter
Job Performed By:	Mr. Mohsin	**Job Location :**	08-10-2025 to 09-10-2025
Monitoring Duration:	(10:00 AM To 09:00 AM) 24 Hrs.		
Project:	INTEGRATED FLOOD RESILENCE AND ADPATION DEVELOPMENT PROJECT (IFRAP)		
Site Location:	Restoration and Strengthening of Flood Embankment Main Rubi Canal-I (PACKAGE-IV)		
Client Name :	CAMEOS Consultant, Quetta Office		

Noise Test Report

S. No	Measuring Parameter	Testing Instrument	WHO Limit	NEQS & BEQS Limits	TIME	Results
01	Noise Level	Noise Meter	65 dB(A) (Day time)	75 dB(A) (Day time)	10:00AM	65.2
02					11:00AM	61.8
03					12:00PM	64.5
04					01:00PM	68.3
05					02:00PM	59.2
06					03:00PM	63.7
07					04:00PM	57.7
08					05:00PM	66.9
09					06:00PM	61.4
10					07:00PM	63.8
11					08:00PM	60.3
12					09:00PM	55.4
13					10:00PM	62.1
14			55 dB(A) (Night time)	65 dB(A) (Night time)	11:00PM	50.9
15					12:00AM	45.6
16					01:00AM	51.8
17					02:00AM	54.5
18					03:00AM	50.1
19					04:00AM	56.3
20					05:00AM	44.8
21					06:00AM	54.0
22			65 dB(A) (Day time)	75 dB(A) (Day time)	07:00AM	50.2
23					08:00AM	57.2
24					09:00AM	59.6
					Average Result	57.5

Note:
BHQS=Baluchistan Environmental Quality Standards
The instruments used were duly calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported da
This report is not valid for Court evidence/ Judicial
The measurement results based on the time of
WL – Within Limit

Field Analyst: Mr. Mohsin

Chief Chemist: Kashif Alam

ASCERT ISO 45001:2018 ASCERT ISO 14001:2015

New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
Mob: +92(0)346-2225261,0333-2699016 Tel # 02135121125 E-mail: info@sespaklab.com Web: www.sespaklab.com

Sustainable Environmental Services | SES

Analysis Report — Ref # SES/Env/OCT/25/2893/3784 B — Date:13-OCT2025

Description:

Quantity of sample	1.0 Liter	Sampling Methodology	Grab	Sampling Date	08-10-2025
Analysis Type	Chemical Analysis			Sampling Location	Project Site
Project	INTEGRATED FLOOD RESILIENCE AND ADPATION DEVELOPMENT PROJECT (IFRAP)				
Site Location:	Restoration and Strengthening of Flood Embankment Main Rabi Canal-1 (PACKAGE-IV)				
Client Name :	CAMEOS CONSULTANT, QUETTA OFFICE				

Ground Water Test Report

S.No	Measuring Parameter	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Results
1	Temperature AT 40 °C	°C	By Calibrated Thermometer	40 – ≤ 03 °C	40 – ≤ 03 °C	40 – ≤ 03 °C	32.1
2	pH @ 25 °C	pH	ASTM D-1293	6 to 9	6 to 9	6 to 9	714
3	Biological Oxygen Demand	BOD5 (mg/L)	APHA 5210	80	80	80	69.2
4	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	150	150	136.3
5	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500	3500	3500	1951
6	Total Suspended Solids	TSS (mg/L)	APHA 2540-D	200	200	200	135.2
7	Oil & Grease	O.Gr(mg/L)	ASTM D-4281	10	10	10	0.06
8	Chloride	Cl^- (mg/L)	ASTM D-512	1000	1000	1000	516
9	Phenolic compound	Phol (mg/L)	ASTM D-1783	0.3	0.3	0.3	ND
10	Fluoride	F (mg/L)	APHA 4500-F^-	10	10	10	3.5
11	Anionic Detergent	Det (mg/L)	ASTM D-6173	20	20	20	5.3
12	Selenium	Se^{-2} (mg/L)	APHA 4500 Se	0.5	0.5	0.5	ND
13	Sulfide	S^{-2} mg/L)	APHA 4500-$S^{=}$	1.0	1.0	1.0	0.20
14	Ammonia	NH3(mg/L)	ASTM D-1426	40	40	40	15
15	Cadmium	Cd^{+2} (mg/L)	ASTM-D3557	0.1	0.1	0.1	<0.9
16	Chromium Trivalent	Cr^{+3} (mg/L)	APHA 3500-Cr	1.0	1.0	1.0	ND
17	Chromium Hexavalent	Cr^{+6} (mg/L)	APHA 3500-Cr	1.0	1.0	1.0	0.038
18	Lead	Pb^{+2} (mg/L)	ASTM D1589	0.5	0.5	0.5	0.7
19	Mercury	Hg^{+2} (mg/L)	Kit Method	0.01	0.01	0.01	ND
20	Nickel	Ni^{+2} (mg/L)	HACH Dimethylglyoxime Method	1.0	1.0	1.0	ND
21	Silver	Ag (mg/L)	ASTM-D3866	1.0	1.0	1.0	ND
22	Zinc	Zn^{+2} (mg/L)	HACH Zincon Method	5.0	5.0	5.0	0.7
23	Total Iron	Fe2+ (mg/L)	APHA 3500-Fe	8.0	8.0	8.0	0.6
24	Manganese	Mn^{+2}(mg/L)	APHA 3500-Mn	1.5	1.5	1.5	0.05
25	Boron	B(mg/L)	APHA 4500-Mn	6.0	6.0	6.0	0.9
26	Sulfate	SO_4 (mg/L)	APHA 4500-SO^{-4}	600	600	600	219
27	Arsenic	As (mg/L)	Palintest Kit	1.0	1.0	1.0	ND
28	Copper	Cu^{2+} (mg/L)	HACH Biquinoline Method	1.0	1.0	1.0	0.04
29	Chlorine	Cl2 (mg/L)	HACH DPD Method	1.0	1.0	1.0	ND
30	Aluminum	Al (mg/L)	HACH Eriochrome Cyanine R	1.0	1.0	1.0	ND
31	Total KjheldalNitrogen	(mg/L)	Kit Method	2.0	2.0	2.0	0.32
32	Barium	Ba (mg/L)	ASTM D-4382	1.5	1.5	1.5	0.21

Note:

BEQS–Baluchistan Environmental Quality Standards
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported da
This report is not valid for Court evidence/ Judicial
The measurement results based on the time of re
WL– Within Limit

Field Analyst: _____ Mr. Mohsin

Chief Chemist: _____

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New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
Mob: +92(0)346-2225261,0333-2699016 Tel # 02135121125 E-mail: info@sespaklab.com Web: www.sespaklab.com

Sustainable Environmental Services | SES

Analysis Report Ref # SES/Env/OCT/25/2902/3792 -G Date:11-10-2025

Description:

Job Location:	HUB	**Testing Instrument**	24 Hours Air Monitoring Station
Job Performed By:	Mr. Mohsin	**Job Date :**	08-10-2025 to 09-10-2025
Monitoring Duration:	(10:00 AM To 09:00 AM) 24 Hrs.		
Project:	INTEGRATED FLOOD RESILIENCE AND ADPATION DEVELOPMENT PROJECT (IFRAP)		
Site Location:	Restoration and Strengthening of Flood Embankment Main Rabi Canal-2 (PACKAGE-IV)		
Client Name :	CAMEOS CONSULTANT, QUETTA OFFICE		

Ambient Air Quality Monitoring

Sr.	Measuring Parameters	Unit	WHO Limit	NEQS & BEQS Limits	Average Test Result	Remarks
1.	Oxide Of Nitrogen as (NO)	$\mu g/m^3$	-	40 (24 hrs.)	13.9	WL
2.	Oxide Of Nitrogen as (NO_2)	$\mu g/m^3$	25(24 hrs.)	80 (24 hrs.)	32.17	WL
3.	Sulphur Dioxide (SO_2)	$\mu g/m^3$	40(24 hrs.)	120 (24 hrs.)	5.125	WL
4.	Carbon Monoxide (CO)	mg/m^3	4(24 hrs.)	5 (08 hrs.)	0.0421	WL
5.	Particulate Matter (PM 2.5)	$\mu g/m^3$	15(24 hrs.)	35 (24 hrs.)	27.95	WL
6.	Particulate Matter (PM 10)	$\mu g/m^3$	45(24 hrs.)	150 (24 hrs.)	81.81	WL
7.	SPM	$\mu g/m^3$	-	500 (24 hrs.)	109.1	WL
8.	Ozone (O_3)	$\mu g/m^3$	60(Peek Season)	130 (01 hr.)	5	WL

Note:

BEQS–Baluchistan Environmental Quality Standards
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported data in future
This report is not valid for Court evidence/ Judicial knowledge
The measurement results based on the time of monitoring
WL– Within Limit

Field Analyst: Mr. Mohsin

Chief Chemist: Ashif Ahmed

ASCERT ISO 45001:2018 | ASCERT ISO 14001:2015 | ASCERT ISO 9001:2015

New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
Mob: +92(0)346-2225261,0333-2699016 Tel # 02135121125 E-mail: info@sespaklab.com Web: www.sespaklab.com

ANNEXURE: J

GENDER ACTION PLAN (GAP)

Flood Resilience and Adaptation Project-(IFRAP) Component-1

1. Introduction

The 2022 floods in Balochistan disproportionately affected women and girls due to pre-existing gender inequalities, socioeconomic vulnerabilities, and limited access to resources. The Integrated Flood Resilience and Adaptation Project (IFRAP) seek to address these challenges through **Component 1,** which focuses on resilient infrastructure, community preparedness, and institutional strengthening. This **Gender Action Plan (GAP)** ensures that gender equality and women's empowerment are systematically integrated into Component 1 interventions, in line with the World Bank Gender Strategy, Environmental and Social Framework (ESF), PDNA, and the Resilient Recovery, Rehabilitation, and Reconstruction Framework (4RF).

2. Objectives of the Gender Action Plan

This Gender Action Plan (GAP) for Component 1 is prepared in accordance with the World Bank Environmental and Social Framework (ESF) and Environmental and Social Standards (ESS1–ESS10).

Specific Objectives

- It aims to ensure meaningful participation and leadership of women in project planning, implementation, and monitoring.
- Enhance women's access to gender-responsive infrastructure, services, and disaster risk management systems.
- Strengthen institutional capacity for gender-sensitive and inclusive project implementation.
- Reduce gender-based vulnerabilities and strengthen safeguards, including prevention of SEA/SH.
- Establish clear indicators and monitoring mechanisms for gender accountability.

3. Key Gender Issues in Component 1

- Limited participation of women in community-level disaster risk management and decision-making bodies.
- Inadequate consideration of women's needs in flood-resilient infrastructure and service delivery.
- Barriers to women's access to early warning information and disaster preparedness systems.
- Weak institutional capacity for gender mainstreaming and GBV risk mitigation.
- Lower literacy rates among women limit access to written project information.

Gender Action Matrix

Strategic Area	Activities	Indicators	Targets	Responsibility	Timeline
Institutional Strengthening & Participation	• Ensure at least 40% women's representation in community-level FGDs and Consultations. • Provide gender-sensitivity, SEA/SH, and safeguards sessions to community	• 40% women in DRMCs. • of personnel trained (gender-disaggregated). • #of women-form groups	• 40% women representation. • 100% CSC staff and contractors trained.	PIU,CSC Gender/Social Specialist	Throughout project

Strategic Area	Activities	Indicators	Targets	Responsibility	Timeline
	• Engage local women's organizations for community outreach. •Provide gender-sensitivity, SEA/SH, and safeguards sessions to CSC and contractor staff	and engaged in activities.			
Gender-Responsive Infrastructure and Services	• Integrate women-friendly design (Footbridges and/or passages in strategic locations of the irrigation system accessibility) in flood-resilient sub-project reconstruction. • Prioritize pregnant/lactating women and women with disabilities during service reconstruction-restoration.	• # of facilities with gender-responsive design. • % women beneficiaries.	• 100% facilities compliant. • 50% women beneficiaries.	CSC and Contractor Infrastructure Specialist	Years 1–3
Disaster Risk Reduction & Climate Resilience	• Include women in early warning dissemination and community preparedness planning. • Conduct disaster preparedness awareness sessions targeting women and girls. • Promote women's engagement in climate-resilient water and land management.	• % women participating in DRR activities. • # women trained.	• 30% women participation. • Annual awareness sessions conducted.	PIU,CSC Social and Gender team	Years 1–3
Safeguards & GBV/SEA/SH Risk Prevention	• Establish GBV referral pathways and confidential reporting mechanisms. • Conduct community-level awareness on GBV Enforce a Code of Conduct for all workers addressing GBV, SEA, and SH. • Ensure labor influx and OHS plans integrate SEA/SH mitigation.	• GBV mechanism operational. • # awareness sessions conducted.	• Functional system in all project areas.	PIU Safeguards Specialist; Contractors;	Throughout the project
Gender responsive Grievance Redress Mechanism	• Establish women-friendly GRM access points, including female focal persons. •Conduct GRM awareness sessions, including women-only sessions.	• **% of project communities informed about the GRM**, disaggregated by gender • **Number of GRM awareness sessions conducted,** including women-only sessions	• 40% women participation. • Monthly and Quarterly awareness sessions conducted.	PIU,CSC Social and Gender team	Throughout project
Monitoring and Reporting	• Monthly ESMP Monitoring Reports • Quarterly Social Safeguards Reports • GAP Progress Reports • GRM records and community feedback	# of reports submitted; completeness source	Monitoring data will be sex-disaggregated and used to adapt implementation as needed.	PIU Gender Specialist will oversee compliance, with third-party monitoring where required.	Throughout project

Strategic Area	Activities	Indicators	Targets	Responsibility	Timeline

4. Stakeholder engagement and women's Consultation

Separate consultations were conducted with women in project-affected villages, facilitated by female social mobilizers. These consultations informed project design and the GAP, highlighting priorities such as access to clean water, safe washing facilities, livelihood support, and energy access.

Women Development Groups (WDGs) have been established to support sustained participation and leadership of women during project implementation and GRM committees are identified at community level.

5. Budget Allocation

A minimum of 1% of the ESMPs of Component 1 budget will be allocated to Social, gender, and Environmental activities implementation, including training, community engagement, gender-responsive design features, and GBV prevention measures.

6. Conclusion

This Gender Action Plan provides a comprehensive, World Bank–compliant framework to ensure that Component 1 of IFRAP delivers equitable, inclusive, and safe outcomes for women and men. The GAP will be implemented as an integral part of the ESMP and updated as needed, based on monitoring results and World Bank guidance.

Gender Inclusion and Social Safeguards Field Monitoring and Screening Checklist

This checklist is to be used as part of ESMP implementation monitoring to assess gender inclusion, social safeguards, and GBV/SEA/SH risk management at the subproject level.

1. General Information

1 Subproject Name:
2 Location:
3 Date of Visit
4 Name of Enumerator
5 Team Composition (Male/Female)

2. Participation & Consultation

No.	Indicator	Yes / No	Remarks
1	Were women consulted separately (FGDs/meetings)?	☐ Yes ☐ No	
2	Were female social mobilizers present?	☐ Yes ☐ No	
3	Was women's participation at least 30–40%?	☐ Yes ☐ No	
4	Were meetings timing suitable for women?	☐ Yes ☐ No	

5	Was the venue safe and culturally appropriate?	☐ Yes ☐ No	
6	Were vulnerable women included (widows, elderly, disabled)?	☐ Yes ☐ No	

3. Access to Information

No.	Indicator	Yes / No	Remarks
1	Are women aware of project activities?	☐ Yes ☐ No	
2	Are IEC materials accessible and understandable?	☐ Yes ☐ No	
3	Are female mobilizers providing information?	☐ Yes ☐ No	
4	Are women aware of GRM?	☐ Yes ☐ No	
5	Is GRM information displayed at site?	☐ Yes ☐ No	

4. Livelihood & Economic Inclusion

	Indicator	Yes / No	Remarks
1	Are women involved in livelihood activities?	☐ Yes ☐ No	
2	Are income generation opportunities provided?	☐ Yes ☐ No	
3	Are women considered for project employment?	☐ Yes ☐ No	

5. Safety & Mobility

No.	Indicator	Yes / No	Remarks
1	Are safe access routes available for women?	☐ Yes ☐ No	
2	Is women's movement restricted due to project?	☐ Yes ☐ No	
3	Are separate and safe spaces available?	☐ Yes ☐ No	

6. GBV / SEA / SH Risk Management

No.	Indicator	Yes / No	Remarks
1	Is Code of Conduct implemented at site?	☐ Yes ☐ No	
2	Are workers trained on GBV/SEA/SH?	☐ Yes ☐ No	
3	Are women aware of reporting mechanisms?	☐ Yes ☐ No	
4	Are confidential reporting channels available?	☐ Yes ☐ No	
5	Is there a female focal point for complaints?	☐ Yes ☐ No	

6	Are service providers (health/legal) identified?	☐ Yes ☐ No	
7	Is worker–community interaction controlled?	☐ Yes ☐ No	

7. Health & Basic Services

No.	Indicator	Yes / No	Remarks
1	Do women have access to nearby health services?	☐ Yes ☐ No	
2	Are women facing difficulty accessing health facilities?	☐ Yes ☐ No	
3	Are sanitation facilities available for women?	☐ Yes ☐ No	

8. Women Development Groups (WDGs)

No.	Indicator	Yes / No	Remarks
1	Are WDGs formed in the area?	☐ Yes ☐ No	
2	Are women actively participating?	☐ Yes ☐ No	
3	Are WDG members involved in decision-making?	☐ Yes ☐ No	
4	Are meetings conducted regularly?	☐ Yes ☐ No	

9. Community Feedback & Needs

No.	Indicator	Yes / No	Remarks
1	Do women demand electricity/solar solutions?	☐Yes ☐ No	
2	Do women highlight need for schools?	☐ Yes ☐ No	
3	Do women report water/sanitation issues?	☐ Yes ☐ No	

Key Issues Identified_____

Recommendations_____

Compliance Summary

Overall Compliance Rating: ☐ Good ☐ Moderate ☐ Poor

Verification

Name: _____

Designation: _____

Organization: _____

Signature: _____

Date: _____

ANNEXURE: K

ENVIROMENTAL AND SOCIAL SCREENING CHECKLIST (B)

Component 1: Community Infrastructure Rehabilitation

A	General Information	
1	Subproject Location	**District: Naseerabad Village**:
2	Package	Package - IV
3	Subproject Activities	Rabi Canal Flood Protection Embankment
4	Proposed Date of Commencement of Work	
5	Important geographic / topographic feature (if any)	N/A
6	Important biological feature (if any)	N/A
7	Sensitive Receptors within 200 m	

B: Environmental Issues

Sr. No	Issues	No/Yes	Risk Level				Remarks/Mitigation Measures
			Low	Moderate	Substantial	High	
1	Will the subproject involve significant land disturbance or site clearance?	Yes		✓			Clearing of Shrubs & Bushes (Acacia)
2	Will the subproject require the setting up of ancillary facilities?	Yes	✓				Temporary camp
3	Will the subproject require a large amount of raw or construction materials, energy and/or water?	Yes		✓			Cement, sands etc. may be required.
4	Will the subproject generate large amounts of residual wastes, construction material waste?	No					No residual waste, construction material waste is expected.
5	Is the sub-project expected to result in soil erosion?	Yes	✓				Little soil erosion is expected during construction works.

6	Is the sub project expected to create borrow pits for construction material?	No					Yes, (reference Section 3.3.1)
7	Will the subproject result in potential soil or water contamination (e.g., from oil, grease and fuel from equipment yards)?	No					Yes, (reference Section 6.5.1.4 & 6.5.2.9)
8	Will the subproject involve the storage, handling, or transport of hazardous substances?	No					The subproject will not 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 activity, vehicular/ machinery exhaust emissions, etc.)	Yes	✓				Little vehicular and dust emission is expected due to construction work.
10	Will the subproject increase ambient noise levels?	Yes	✓				Little noise pollution is expected due to construction machinery etc.
11	Are there any protected areas on or around the locations which could be affected by the subproject?	No					No protected areas observed nearby the subproject.
12	Will there be any adverse impact on the flora due to subproject activities?	Yes	✓				Bushes and shrubs removing expected.
13	Will there be any adverse impact on the fauna due to subproject activities?	No					Fauna will not impact by the subproject.

C: Social Issues

Sr. No	Issues	No/Yes	Risk Level				Remarks/Mitigation Measures
			Low	Moderate	Substantial	High	

1	Will the subproject activities involve a significant inflow of labor?	Yes		✓			Local labor will be engaged as for as possible.
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)?	No					No outside labor camps are expected community coordination will be ensured if labor camp has proposed.
3	Will the activities supported by the project anticipate the occurrence of child labor, forced labor, or bonded labor?	No					Contractor will comply with labor laws and strict monitoring will be ensured.
4	Will the subproject activities pose risks to nearby sensitive receptors (mosque, temple, church, graveyard, hospital, school/college/university), if any?	No					No sensitive receptors identified and Safety barrios will be installed as per the need.
5	Will the sub project pose occupational health and safety risks?	Yes	✓				Contractor will provide PPE safety training and first aid and other occupational health and safety related googles and trainings.
6	Will the sub project pose community health and safety risks?	Yes	✓				Risks include public access to open excavations and construction traffic. Mitigation includes fencing, signage, and traffic management (Section 6.5.2.2)
7	Risk of increase in traffic and pedestrian safety due to the construction vehicle movement, particularly near sensitive receptors.	No					the subproject will not expect to cause any traffic incidents. If required TMP will be prepared and implanted.
8	Will there be land acquisition? If yes, is the site for land acquisition and ownership status and current usage of land to be acquired known?	No					All work in existing rows.
9	Will there be a loss of shelter and residential land due to the land acquisition or clearance of the existing site?	No					None as work is within existing row.
10	Are any informal settlers or flood-affected persons present on the subproject site where construction and rehabilitation activities will be carried out?	No					No informal settlers or flood-affected persons present at the site.

11	Has there been any Anti-Encroachment Drive to forcefully evict/move people at the site where the works are planned to be carried out?	No					The subproject site is free from encroachment.
12	Will there be a loss of agricultural land, crops, trees, and fixed assets due to land acquisition?	No					This site has no land acquisition agricultural land.
13	Will people lose access to natural resources, communal facilities and services due to involuntary land use restrictions or access to legally designated parks/protected areas?	No					No Access will be maintained during activity.
14	Any estimate of the likely number of persons affected by the subproject? If yes, approximately how many? Are any of them falling into disadvantaged/vulnerable groups such as Female/child headed households, Internally Displaced Persons (IDPs), Refugees, Ethnic and religious minorities, Persons with disabilities, Transgender communities, Senior citizens, or economically marginalized groups)?	No					Each and every community is totally safe no one is effected.
15	Have there been any past security-related issues at the subproject site?	No					No area is safe
16	Has stakeholder engagement taken place with relevant stakeholders (Provincial/District level Government Departments / Communities /NGOs/CSOs) for the subproject?	Yes	✓				Initial consultations carried out both with community and administration further engagement will continue during implementation.
17	Is the subproject being implemented in an area with natural hazard risk? (e.g., floods, earthquakes, cyclones etc.).	Yes					Yes, the project area is in a flood-prone zone. The ESMP includes specific mitigation measures for flood risk (see Sections 6.5.1.8, 6.5.2.5.1, and Annexure-R)
18	Will there be any impact on women that may hinder their mobility during	No					Women's mobility will not be hindered by the subproject activities.

	reconstruction and rehabilitation activities?						
19	Will the proposed subproject potentially involve shifting of public utilities?	No					No required
20	Are any indigenous peoples (as per World Bank ESS7) present in the subproject area?	No		✓			As per World Bank ESS7, no Indigenous Peoples (as defined by the policy) are present in the project area. All communities are considered part of the mainstream population under national law.
21	Will the construction and rehabilitation activities cause socio-cultural issues and damage any cultural heritage site?	No					No cultural heritage site present

No Objection Certificate (NOC)

Balochistan Environmental Protection Agency (BEPA) NOC / Environmental Approval Required	Yes [ ] No, if Yes, select the required study from below
Type of Environmental and Social Study	EIA [ ], IEE [ ], Environmental Checklist [ ]
Any other NOC from Government of Balochistan (Gob)/ Government of Pakistan (Gop) Required	[ ] Yes, [ ] No, if Yes, please specify

For World Bank Approval

Further assessment required	[ ] Yes [ ] No, if Yes, select the required study from below
Type of Environmental and Social Assessment	ESIA [], ESMP s[ ], E&S Checklist shall suffice [ ], RAP [ ], PCRMP [ ], Water Balance Study [ ], GHG Estimation [ ], BAP [ ], E&S Audit [ ]

Conducted by:

Name: Mir Zarak Rodeni **Designation: Social Organizer**

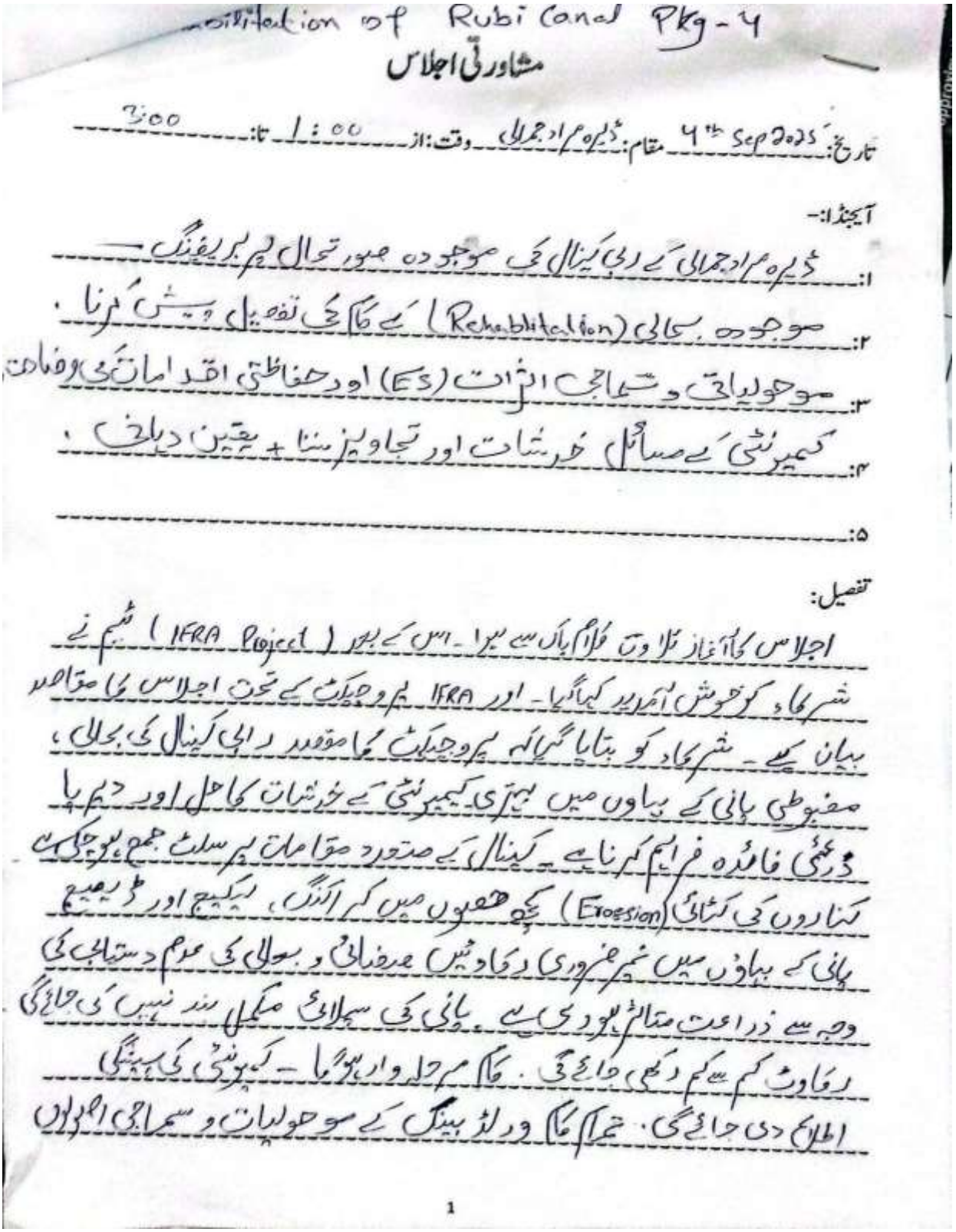
Signature_____Date_____

Reviewed and approved by:
Name_____ **Designation**_____

Signature_____ Date_____

ANNEXURE: L

COMMUNITIES CONSULTATIONS AT SITE OF RABI CANAL



Rehabilitation of Rubi Canal Pkg-4

مشاورتی اجلاس

تاریخ: 6th Sep 2023 مقام: ڈیرہ مراد جمالی وقت: از 1:00 تا: 3:00

ایجنڈا:-

۱: ڈیرہ مراد جمالی سے ربی کینال کی موجودہ صورتحال پر بریفنگ

۲: موجودہ بحالی (Rehabilitation) کے کام کی تفصیل پیش کرنا۔

۳: سوشیو اقتصادی و سماجی اثرات (ESs) اور حفاظتی اقدامات کی وضاحت

۴: کمیونٹی کے مسائل، خدشات اور تجاویز سننا + یقین دہانی۔

۵:

تفصیل:

اجلاس کا آغاز تلاوت کلام پاک سے ہوا۔ اس کے بعد (IFRA Project) ٹیم نے شرکاء کو خوش آمدید کہا گیا۔ اور IFRA پروجیکٹ کے تحت اجلاس کا مقاصد بیان کیے۔ شرکاء کو بتایا گیا کہ پروجیکٹ کا مقصد ربی کینال کی بحالی، مضبوطی پانی کے بہاؤں میں بہتری کمیونٹی کے خدشات کا حل اور دیرپا ڈرینیج فائدہ فراہم کرنا ہے۔ کینال کے متعدد مقامات پر سلٹ جمع ہو چکی ہے کناروں کی کٹائی (Erosion) کچھ حصوں میں کریکنگ، لیکیج اور ڈرینیج پانی کے بہاؤں میں نمبر ضروری رکاوٹیں مرمتی و بحالی کی عدم دستیابی کی وجہ سے زراعت متاثر ہو رہی ہے۔ پانی کی سپلائی مکمل بند نہیں کی جائے گی رکاوٹ کم سے کم رکھی جائے گی۔ کام مرحلہ وار ہوگا۔ کمیونٹی کی پیشگی اطلاع دی جائے گی۔ تمام کام ورلڈ بینک کے سوشیو اقتصادی و سماجی اصولوں

1

اصولوں کے مطابق ہوں گے۔ کمیونٹی کو ہر مرحلے پر شامل رکھا
جائے گا۔ ہمارا مقصد علاقے کی ترقی، زراعت کی بہتری اور پانی
کی دستیابی کو مضبوط کرنا ہے۔

آخر میں کمیونٹی نے (IFRA PROJECT) کے عہدیداروں کو
سراہا اور مکمل تعاون کی یقین دہانی کرائی۔ ٹیم نے تمام شرکاء
کا شکریہ ادا کیا اور اجلاس اختتام پذیر ہوا۔

تصدیق کنندہ:

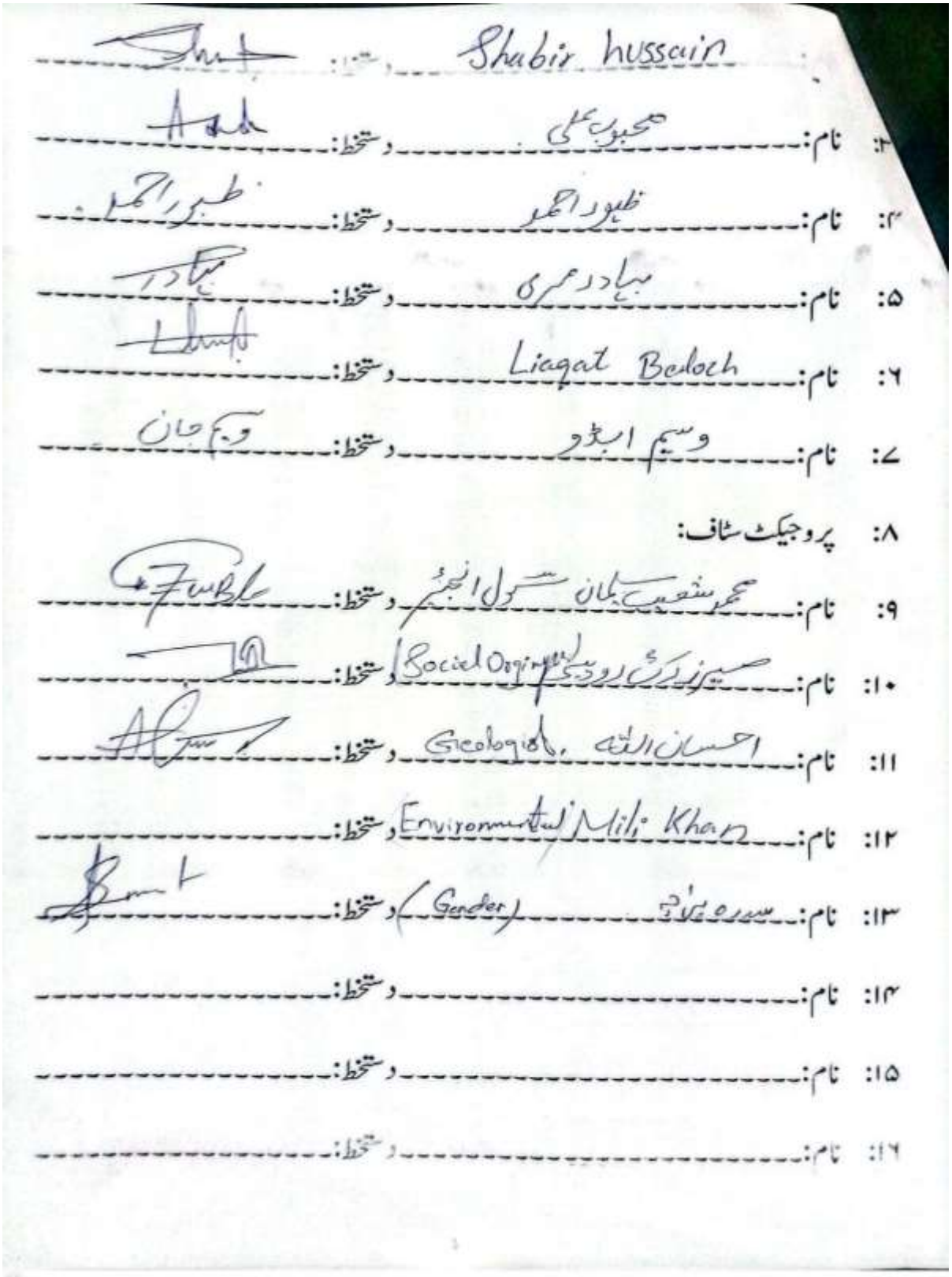
۱: ایل جی آر سی ممبر کسان انجن: نام: عبدالرحیم سنگل والد امام بخش دستخط: عبدالرحیم سنگل

۲: ایل جی آر سی ممبر کسان انجن: نام: اللہ دتہ والد نعیم احمد دستخط: اللہ دتہ

۳: کمیٹی ممبرز

۱: نام: امام دین والد سیف اللہ دستخط: امام دین

2


Shabir hussain

۳: نام: محبوب علی دستخط:

۴: نام: ظہور احمد دستخط:

۵: نام: بہادر عمری دستخط:

۶: نام: Liaqat Baloch دستخط:

۷: نام: وسیم ابڈو دستخط:

۸: پروجیکٹ سٹاف:

۹: نام: محمد شعیب بلوچ سوشل انجینئر دستخط:

۱۰: نام: حسین زرکون (Social Organizer) دستخط:

۱۱: نام: احسان اللہ Geologist دستخط:

۱۲: نام: Environmentalist Mili Khan دستخط:

۱۳: نام: (Gender) دستخط:

۱۴: نام: دستخط:

۱۵: نام: دستخط:

۱۶: نام: دستخط:

ANNEXURE: M

LIST OF PARTICIPANTS IN CONSULTATIVE MEETING WITH DISTRICT ADMINSITRATION

S. No	Name	Department	Designation
1	Mr. Ibrahim Ismail	Administrative /Revenue Department	Deputy Commissioner Naseerabad
2	Capt (R) Zulfiqar Ali Qarar,	Administrative /Revenue Department	Assistant Commissioner Naseerabad
3	Mr. Ateeq Luni	Agriculture Department	Director Agriculture Naseebabad
4	Mr. Fareed Pandrani	Irrigation Department	SDO Irrigation
7	Shakoor Kakar	CAMEOS Project	Social Safeguard Specialist
8	Naqeeb Ullah Kakar	CAMEOS Project	Social Safeguard Specialist
9	Sidra	CAMEOS Project	Gender Specialist
10	Mir Zarak	CAMEOS Project	Social field staff (Baseline Data collection)

ANNEXURE: N

LABOUR INFLUX PLAN

This plan identifies labour requirements and sets out the procedures for addressing labour conditions and risks associated with the proposed project, which is aimed at helping PIU to determine the resources necessary to address project labor issues.

SUB-CATEGORY	WORKER IMPACTS\RISKS	PROJECT IMPACTS\RISKS	MITIGATION MEASURES
Employment	Influx of many foreigners into project community	Competition on livelihood and job opportunity with locals	No of unskilled labour shall be from the project community. Where possible qualified skilled workers on contract shall also be sourced within the community
Housekeeping.	The general appearance of the camp deteriorates making camp life unpleasant.	The overall camp experience is compromised which in turn leaves workers demoralized and unproductive.	Ensure that camp grounds and common areas are routinely cleaned and organised with appropriate signage in place, and that grounds are maintained (e.g., grassed areas are regularly mown). Establish easily accessible, designated smoking areas which are clearly highlighted and regularly cleaned.
Recreation.	Workers spend most of their time in the camps and could become disenchanted and bored. They may want to leave the camps and go into the local towns and villages in search of recreation.	Tensions arise from the local communities as workers impact their activities in search of recreation. An increase in alcohol consumption and prostitution could result due to the influx of workers into local communities.	Provide appropriate recreational facilities and activities. These should be discussed with the camp residents committee.
Spiritual /Religion.	Workers will want access to places of worship for their chosen religion. They may leave the camps and go into the local towns and villages in search of an appropriate place of worship.	Tensions arise from the local communities as workers impact their activities.	Provide appropriate places of worship where residents express a need for this in accordance with cultural sensitivities, and assess transport arrangements on a case-by-case basis. Ensure that equipment and facilities are kept clean and well maintained.

SUB-CATEGORY	WORKER IMPACTS\RISKS	PROJECT IMPACTS\RISKS	MITIGATION MEASURES
Security.	Inconsistent and aggressive behaviour of security personnel towards workers can result in tensions and conflict in the workplace and a perception of human rights abuses.	Insufficient training and control of security personnel can lead to the inappropriate use of force, while protecting Project workers and assets, or inappropriate behaviour towards local populations, resulting in human rights claims.	Ensure that camp security personnel meet at least the following requirements: • Have not been implicated in past abuses • Are trained in appropriate conduct towards workers and community members including: o Exercising constraint and caution and understand how force may be used o Respecting human rights o Behaving consistently o Knowing and abiding by applicable laws o Fostering good community relations through their interaction and behaviour towards the workforce and communities
Community relations.	Communities are negatively impacted by camp activities: noise, waste, traffic, lighting and so forth. This may result in negative actions towards camp operations such as road closures and the prevention of workers or suppliers from entering the worksite.	Workers are stopped from going to work, which affects productivity.	Implement control measures to avoid and minimise the impacts of camp and living conditions on communities. Limit foreign worker interaction with communities and provide cultural sensitivity awareness training to facilitate appropriate interaction with communities.

ANNEXURE: O

CAMP MANAGEMENT PLAN

Company XXX (the Company) has developed this Camp Management Plan as part of its Environmental and Social Management Plan (ESMP) outlining a range of mitigation measures designed to avoid or reduce undesired camp management impacts during construction. This document establishes a basis and template for use by the Contractor(s) to develop their own plans outlining not only mitigation measures but to also incorporate the roles and responsibilities described in the ESMP.

The objectives of the Camp Management Plan are:

Avoid or reduce negative impacts on the community and maintain constructive relationships between local communities and workers' camps; and

Establish standards on worker welfare and living conditions at the camps that provide a healthy, safe and comfortable environment.

This Plan should be read in conjunction with other environmental and social management plans (ESMPs), if available including:

- Traffic Management Plan
- Security Plan
- Stakeholder Engagement Plan

Legal Requirements and Grievances

The Contractor is required to operate within the parameters of the Pakistan's Standard Labor Laws & Policy and the International Labour Organization guidelines. The World Bank Performance Standards are applicable to IFRAP and its subprojects. Furthermore, the Grievance Redress Mechanism contained in this ESMF is required to be adhered to by the Contractor.

Contractor personnel shall conduct regular safety walks and an HSE committee will track performance against requirements stipulated in this plan. The Contractor will also have its grievance mechanism developed for the project.

Additionally, Contractor would be required to sign and acknowledge the Code of Conduct and agree to abide by its provisions.

ANNEXURE: P

PROJECT TRAFFIC MANAGEMENT PLAN (SAMPLE)

1. Introduction

This Traffic Management Plan describes procedures and protocols for site access, traffic routing and management, and contractor company guidelines with respect to vehicle and employee transportation in delivering their obligations on this intervention project. Public, employee and contractor safety is the primary goal of this plan. It is vital that the Contractor recognizes that the traffic within the project area will be dynamic throughout the course of execution of this works and the safety of other road users is absolutely essential during this time.

2. General Site Access

In the interest of site security and public safety, access to operational areas or locations where heavy-duty machinery would be operated in related to the execution of this contract will be restricted to authorized site personnel through the usage of signs and gates where appropriate. Facilities that potentially present danger to persons or wildlife such as the electrical substation, equipment staging area and workers camp will be fenced or barricaded as appropriate to prevent general access.

3. Traffic Management

- All traffic on routes to and from the site will be radio controlled. Where this is not possible, signage will be installed at appropriate locations in order to warn the public along these routes.
- In the event that temporary closure occurs, access to the sites will be further restricted through the use of fences and gates as appropriate. Access to work areas such as temporary excavated places, or confined spaces where work is ongoing will be securely blocked by means of a temporary but robust barrier or barricade. Buildings and ancillary facilities will be locked and secured. A number of additional general measures related to site access, road management and public safety and construction events notification are presented here:
- Private employee off-road vehicles or private transport buses will be prohibited from entry into the site.
- Signage will be posted near all construction sites.
- Notifications will be provided for activities that would be carried out over the weekend or public holiday periods. These would be disseminated through existing social institutions such as the village or district heads of communities, Local Government Councilors and NGO’s or CBO’s
- Speed limit maintained at 10 km/hr speed limit within or near the communities;
- Install reverse alarm fitted on all trucks, heavy duty equipment and off road vehicles
- Employ or engage the use of a minimum of two flagmen around excavated areas, one for traffic approach and one to direct traffic away from the sites

In accordance with the Occupational Health and Safety Regulations for public roads, use of flashing devices/trifactor on all vehicles/machinery and equipment that will cross, travel on or may otherwise pose a risk to users of public roads.

4. Employee Transportation

To the extent possible employees will use buses provided by the contractor as transportation to and from the site, thereby reducing overall vehicle traffic. Project vehicles or will be utilized by staff, only when necessary.

5. Speed Limits

Speed limits will be enforced to and from the site and signage(s) shall be posted along the access and site roads (maximum 40 km/hr, reduced to 20 km/hr at blind corners and bridge crossings. Traffic along other access roads will be radio controlled for safety and speed control. Furthermore, employees and contractors will be educated on safety including traffic protocols and speed limits during mandatory orientation. Routine traffic inspections and/or speed indicator signs will be used to encourage safe and responsible driving.

6. Communications And Notification Protocols

It is anticipated that the intervention project will require only single-lane temporary closures. Signage warnings of construction activities on the roads will be placed at appropriate distances from the construction site, in consultation with C&W Department, GoB. For significant work activity (those requiring more than one day to complete), written notification will be distributed to residents and other line departments. A public notice would be posted at multiple locations in the metropolis to communicate to residents any new activities that may be occurring or scheduled. Contact information for the Contractors senior management will be included in this notice and any concerns regarding the intervention work/project or traffic management can be forwarded through this notification system.

7. Traffic Routing and Volumes

Alternative traffic routing shall be mapped out and provided in the event that there will be complete closure of the road due to this intervention work activity. Traffic officers and appropriate road diversion signage(s) shall be deployed to ensure diversions routes are properly identified and traffic is directed along the mapped route. The flagmen shall be properly kitted in their Personal Protective Equipment (PPE), such as reflector vests and safety boots, to ensure that safety on the job is given due priority.

8. Reporting

Records on traffic management and implementation of this plan should be kept and updated by the contractor as evidence of ongoing mitigation compliance, which will be submitted to PIU as part of routine reports on progress of work.

ANNEXURE: Q

OCCUPATIONAL HEALTH & SAFETY (OHS) PLAN (SAMPLE)

Project Activity	Potential Impact	Proposed Mitigation Measures/ Actions	Responsibility for mitigation
I. Pre-Construction Phase			
Site clearing for staging area Mobilization of Excavation, dredging or grading, compaction, filling Plant & Equipment	Occupational accidents and injuries to workers and risk to community health and safety	Develop and implement a project specific Occupational Health and Safety Plan (OHSP). OHSP to include but not limited to: -Prohibition of drug and alcohol use by workers while on the job. - Provision of adequate first aid, first aiders, PPE, signage (English, Urdu, Balochi, and sindhi languages). - Restriction of unauthorized access to all areas of high-risk activities - Provision of specific personnel training on worksite OHS management - Ensure that staging areas for contractor equipment are adequately delineated and cordoned off with reflective tapes and barriers - Any uncovered work pits should have appropriate signage and protection around them - Workers should get a daily induction/toolbox before going on the site and a refresher of what happened on site a day before - Adequate safety signage on construction sites should be installed to alert community/drivers/pedestrians - lighting and/or reflective tapes and signage integrated in all worksites for safety at night - appropriate security measures in place to prevent harassment or kidnapping of workers - Ensure contractors employees are aware of security threats in work location by having in place a Security Management Plan and should refer to it at all times	**Contractor**
Mobilization of personnel, equipment, machinery, heavy duty vehicles for preparation of workers' camp	Exposure to and transmission of COVID-19	*Ensure implementation of the government established and PIU preparedness & Response protocols on COVID-19 by:	

Project Activity	Potential Impact	Proposed Mitigation Measures/ Actions	Responsibility for mitigation
		*Preventing overcrowding on site by following govt. established regulations on social distancing *Provide wash hand basins for proper and thorough and washing to enter and leave sites *carry out regular temperature checks at the beginning and end of each working day *use of minimum required PPE (face masks, gloves and face shields etc.) *Ensure disinfecting of tools with strong disinfectant (bleach etc.) after work *Provision of an isolation center or room on site	
Use of Workers Camp	Generation of sanitary waste from worker's camp	Ensure provision of sanitary facilities on site for workers and enforce usage. Ensure usage of approved waste vendor for waste evacuation & disposal.	Contractor
trucks for sand & materials supply	Public safety, road accidents leading to injuries and fatalities	Train drivers on defensive driving Conveyance of materials to site shall be by appropriate means of transportation to prevent damage or accidents Provide road signs and flag persons to warn of dangerous conditions of conveying materials such as the water trucks	Contractor PIU Safeguards Team

Project Activity	Potential Impact	Proposed Mitigation Measures/ Actions	Responsibility for mitigation
Excavation, grading, compaction, filling and other civil works for channelization Excavation and compaction activities through construction works will alter the soil properties including loss of valuable topsoil's Use of generators for power supply	Public safety, road accidents leading to injuries and fatalities affecting host community population, which could lead to conflict/ unrest and stoppage of activities.	Develop and implement a project specific Occupational Health and Safety Plan (OHSP). OHSP Ensure QA/QC control is established on inspection of materials, which are to be of best quality to • prevent defective outcomes on construction sites • Ensure workers are aware of inherent risks in use of pavement materials such as bitumen • Use of appropriate PPE to ensure risks to accidents & incidents are minimized or eliminated • Use tarpaulins to cover sand and other loose material when transported by trucks • Ensure excavation pits are used for extraction of material only for project purposes and not commercial • Ensure generators are operated by dedicated trained personnel • Carry out regular servicing of generator to reduce release of harmful emissions	Engineering Consultant/Irrigation Department GoB. Environmental Safeguards Specialist Excavation and compaction activities through construction works will alter the soil properties including loss of valuable topsoil's Use of generators for power supply
Use of workers camp	Sanitation issues and public health impacts	• Provide bins on site for temporary storage of domestic waste such as lubricant containers, drinking water sachets and carrier bags/packaging materials. • Dispose all construction and domestic waste at the approved dumpsites and in the approved manner. • Ensure all trenches or excavations made during the construction works do not collect stagnant water, which could breed mosquitoes. • Ensure access to toilets for construction crew or provide temporary toilets (mobile toilets) for use where there are no existing ones. • Ensure mobile toilets/sanitary provisions are provided to reflect gender types.	Contractor/ Engineering Consultant Environmental Safeguards Specialist

Project Activity	Potential Impact	Proposed Mitigation Measures/ Actions	Responsibility for mitigation
		• Ensure regular toolbox meetings are held among contractor workers to offer awareness on transmission of contagious or communicable diseases.	
Construction Machinery & Equipment Movement of materials Use of Compaction, filling & excavation equipment	Occupational accidents and injuries to workers and risk to community health and safety	Develop and implement a project specific Occupational Health and Safety Plan (OHSP). OHSP to include but not limited to: - Prohibition of drug and alcohol use by workers while on the job. - Provision of adequate first aid, first aiders, PPE, signage (English, Urdu, Baloch and Sindhii languages). - Use only trained personnel for welding activities - Restriction of unauthorized access to all areas of high-risk activities - Provision of specific personnel training on worksite OHS management - Ensure that staging areas for contractor equipment are adequately delineated and cordoned off with reflective tapes and barriers - Any uncovered work pits should have appropriate signage and protection around them - Workers should get a daily induction/toolbox before going on the site and a refresher of what happened on site a day before - Adequate safety signage on construction sites should be installed to alert community/drivers/pedestrians - lighting and/or reflective tapes and signage integrated in all worksites for safety at night - appropriate security measures in place to prevent harassment or kidnapping of workers	Contractor
culverts, drainage basins Construction	Occupational accidents and injuries to workers and risk to community health and safety Erosion	• Ensure location is properly cordoned off before construction activities are carried out • Carry out proper levelling and setting out to ensure appropriate road gradient is achieved to prevent ponding/flooding issues	Contractor

Project Activity	Potential Impact	Proposed Mitigation Measures/ Actions	Responsibility for mitigation
	Risk of erosion and flood	• Create awareness in neighbouring communities to ensure road users are aware of road intervention work • Use of biological control measures (tree planting) with tree roots that will bind soil and reduce erosion • As much as possible, ensure community minimises movement around the site and should be informed before this type of work is carried out • Use appropriate signage along road to show work in progress • Use of flagmen to divert traffic where required • Provide side-drains to promote effective run off channelization • Crosscheck design to ensure road gradient is adequate enough to avoid backflow runoff into residences	
Channelization & construction activities	Increase in spread of Communicable diseases, STDs such as HIV/AIDS and other STIs	• Ensure access into construction site is restricted • Vaccinating workers against common and locally prevalent diseases; • Monitoring of local population health data, in particular for transmissible diseases. • Implementation of HIV/AIDS education program; • Information campaigns on STDs among the workers and local community in collaboration WITH relevant HIV/AIDS management organizations	Contractor/ Engineering Consultant
Demobilisation of facilities, excavation, grading, compaction, filling plant & equipment	Risks of occupational accidents and injuries to workers.	Develop & implement a project specific Occupational Health and Safety Plan (OHSP) to include but not limited to: - Prohibition of drug and alcohol use by workers while on the job. - Provision of adequate first aid, first aiders, PPE, signage (English, Urdu, Balochi, and sindhi languages). - Restriction of unauthorized access to all areas of high-risk activities. - Provision of specific personnel training on worksite OHS management	Contractor

Project Activity	Potential Impact	Proposed Mitigation Measures/ Actions	Responsibility for mitigation
		- Ensure that staging areas for contractor equipment are adequately delineated and cordoned off with reflective tapes and barriers - Workers should get a daily induction/toolbox before going on the site and a refresher of what happened on site a day before - Adequate safety signage on construction sites should be installed to alert community/drivers/pedestrians - lighting and/or reflective tapes and signage integrated in all worksites for safety at night appropriate security measures in place to prevent harassment	
Excavation pit decommissioning	Public health	*Level out hollow area of pits to reduce ponding of water & stagnation *Revegetate area around the pit to re-introduce natural habitat formation *Planting of trees to replace felled vegetation Maintain drainage channels to reduce water collection in hollow *Use of brickets in stagnant pond formation areas to eliminate insect breeding *Carry out burrow pit reclamation according to remediation plan	Contractor

ANNEXURE: R

CONTINGENCY AND EMERGENCY RESPONSE PLAN (SAMPLE)

Introduction

An emergency is best described as a serious situation or unforeseen crisis that happens unexpectedly and requires or demands immediate/necessary action. This is often associated with danger. Therefore, this plan has been prepared to establish a process that has been adopted by our organization to respond to any emergency situation. This plan has the following fundamental objectives are:

To ensure that we can identify how to prepare for an emergency provide a checklist of actions that would enable our team prepare to handle such emergencies

The objective

The aim of this plan is therefore to examine a series of steps in the process, which is designed to ensure that any situation that necessitated that the status of emergency be apportioned, be managed in a manner that would ameliorate this condition.

Thus, this plan provides guidelines on the best approach that would be engaged by employees of the Contractor company in emergency situations, which may be as a consequence of the following:

- Medical (health)
- Safety
- Environmental
- Security
- Any other types of emergencies
- Emergency Response Team (ERT)

An emergency response team will be constituted for the project. These will be the group of persons that would have the responsibility of managing this emergency plan in a manner that would ensure the goals of this plan are achieved. For this reason, the members of the ERT are:

- Managing Director (or representative)
- HSEQ Officer
- Project Engineer
- Supervisor

- Support members (headmen from units – civil, mechanical, electrical etc.)
- Supervising Consultant representative
- PIU representative

Emergency Response Centre (ERC)
Due to the temporary nature of the facilities that would be utilized as workers camp & site office, for intervention projects, the site office will also be converted into the Emergency Response Centre (ERC), in cases of emergency. Therefore, appropriate communication equipment shall be available in the office, to ensure that the channels of contact are available, at all times.

In the minimum our ERC will have:

- A computer system with internet facilities available
- A telephone
- A public address system
- Activation of this Emergency Response Centre

The individual that receives the information that could potentially necessitate an emergency response should immediately convey the information to the Project Engineer.

Jointly, the project engineer and the Safety officer will review the situation/information, following which the managing director will be contacted (if not on site).

The managing director will hereafter take the decision of the gravity of the situation, following which it may be necessary to constitute an ERT and convert the site office into the ERC.

Core ERT and support members will be represented once the ERC is activated.
Checklist of Emergency Response Actions

These actions shall be implemented immediately the ERC is activated:

S. Nr	Actions
1	Verify status of emergency and likely exposure of other personnel to risk, ensure ERT members are fully equipped in emergency response equipment
2	Locate and account for all personnel on site (muster point) and if appropriate, implement the evacuation procedure, if necessary. Review
3	Establish and maintain close contact with relevant authorities related or connected to the resolving of this emergency. e.g. in case of medical emergency, a hospital, security emergencies will require a contact with government law enforcement agencies – police etc.
4	Inform supervising consultant & PIU representative as promptly as possible in order to establish interface link with Client
5	Transmit any information update or changes in situation status to emergency focal group; the managing director and members of the ERT and determine if there is a need to shut down critical on going operational activities
6	Depending on the type of emergency, any necessary follow up action should be determined and promptly acted upon, as may be required e.g. medical emergencies may require evacuation, environmental emergencies may require containment, safety emergencies may require prompt cordoning off of area etc.
7	Internal Communication channel with other personnel should be kept open, by means of public address system or telecommunication (walkie talkies) and updates provided to forestall any likely re-occurrences, where possible

S. Nr	Actions
8	Examine cross-cutting impact of emergency on liability issues and operational continuity. e.g. media involvement in security emergencies
9	Undertake an assessment of risk to review other potential liabilities and deploy mitigation measures, where necessary. e.g. workmen compensation insurances in case of accident emergencies
10	Review all cost implications of emergency response actions and make necessary budgetary provisions
11	Provide the PIU with updates immediately additional information is received.

Accident reporting

This accident report would be factual, free from hearsay, assumptions, gossips and / or preliminary conclusions. The report shall be duly signed by the Project engineer. The PIU shall be briefed about the accident in writing within 24 Hours.

Timing of investigation

The investigation should be carried out as soon as possible after the accident. The quality of evidence can deteriorate rapidly with time and delayed investigation are usually not as conclusive as those performed with dispatch. A prompt investigation is a good demonstration of management concern for safety.

Scope of Investigation

The scope of the investigation can be divided into four areas:

- Personnel Technique
- The Environment Organization

In each of these areas, actions of omission may be identified which could be a factor contributing to the accident or subsequent injury, damage or loss.

Establishment of the fact

In establishing the fact(s) of an accident, we would consider the followings as necessary factors:

Background information that would be considered,

- the procedure for this type of operations
- command structure
- the person involved
- Facts collection

Facts collection shall include but not limited to topography, weather, warning signs / notices, condition of the equipment, housekeeping, before interview can be conducted.

R-4 Emergency Action Plan for Embankment Failure is described in Section 6.5.2.5.1

ACCIDENT REPORT AND INVESTIGATION

(Standard report form)

Date: ---------- Time: ----------/AM/PM ----------

Location: ---------- Department: ----------

Supervisor: ---------- ----------

Name of Victim: ---------- ---------

Nationality: ---------- Address: ----------

Marital Status: ---------- Occupation:----------

Date of Birth: ---------- Experience (years):----------

Equipment/tools being used when accident occurred:----------

Description of accident:----------

Name of Witness (if any): ----------

Conditions during accident: weather- dry, rain, clear, dusk, dark etc.

Unsafe acts, actions and conditions (Please describe):----------
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Report verification by:

Name: ----------Date: ----------

ANNEXURE: S

WASTE MANAGEMENT PLAN (SAMPLE)

Project Activity	Potential Impact	Proposed Mitigation Measures/ Actions	Responsibility for mitigation
I. Pre-Construction Phase			
Use of Workers Camp/Sit e Office	Generation of sanitary waste	• Ensure provision of sanitary facilities on site for workers and enforce usage. • Ensure usage of waste management agency • approved waste vendor for waste evacuation & disposal.	Contractor
Movement of plant & equipment to and from staging area to site	Soil contamination	• Develop and implement a site- specific Waste Management Plan (WMP) • Prepare and implement an Emergency Response Plan to respond to incident of spillage. Ensure fuel storage tanks are installed in a bonded area and checked daily. • Ensure regular maintenance of vehicles to avoid leaks of oil. Prevent unregulated dumping of fuel waste • Ensure local communities are sensitized on need to avoid tampering with waste bins	Contractor
Use of workers camp/site office	Sanitation issues and public health impacts	• Provide trash bins on site for temporary storage of domestic waste such as lubricant containers, drinking water sachets and carrier bags/packaging materials. • Dispose all construction and domestic waste at the approved dumpsites and in the approved manner. • Ensure all trenches or excavations made during the construction works do not collect stagnant water, which could breed mosquitoes. • Ensure access to toilets for construction crew or provide temporary toilets (mobile • toilets) for use where there are no existing ones.	Contractor/ Engineering Consultant Environmental Safeguards Specialist
		• Ensure mobile toilets/sanitary provisions are provided to reflect gender types. • Ensure regular toolbox meetings are held among contractor workers to offer awareness on transmission of contagious or communicable • diseases.	

Project Activity	Potential Impact	Proposed Mitigation Measures/ Actions	Responsibility for mitigation
Construction work activities	Generation of construction waste including spoils, debris and concrete	• Develop and implement a site- specific Waste Management Plan (WMP) to include the following: • Ensure segregation of waste to facilitate reuse and recycling opportunities. • Ensure no burning of waste on site. • Ensure usage of approved waste vendor for • waste evacuation, processing & disposal.	Contractor
Operation of workers camp/site office prior to demobilization of facilities	Generation of sanitary waste from worker's camp	• Ensure provision of sanitary facilities on site for workers and enforce usage. • Ensure usage of approved waste vendor for waste evacuation & disposal.	Contractor
Commissioning of library & buildings	Generation of construction waste and debris	• Develop and implement a site- specific Waste Management Plan (WMP) to include the following: • Ensure segregation of waste to facilitate reuse and recycling opportunities. • Site visit at the completion of project to ensure no waste is left behind.	Contractor

ANNEXURE: T

SECURITY MANAGEMENT PLAN (SAMPLE)

The contractor shall pay necessary attention to ensuring security of life & property during the execution of this contract according to the scope of works. In ensuring that this role is carried out, the following will be given priority:

1. Management Commitment and Responsibilities

Management is committed to ensuring that the following are in place:

- Providing up to date information regarding the security management mechanism, tools & updates in and around the work sites
- Ensure necessary early warning system is deployed to respond to security emergencies in the workplace by:
  - Development of a specific step-by-step approach to security response
  - Establish a security task force to respond to specific hazards, which is to be deployed in the case of security emergency (kidnapping, insurgency etc.)

- Employing appropriate personnel for the role of security personnel/advisor(s) and security staff
- Prioritize training of security personnel
- Enforcing disciplinary actions as needed to enforce security compliance
- Promoting interaction and assistance with regulatory and response agencies

2. Threat Assessment and Analysis

A vital component of this Security Management Plan is the identification of internal and external threats. The mechanisms for identifying threats shall comprise but will not be limited to:

- Have in place and periodically update a threat matrix that will be submitted to management for review and approval.
- Undertake periodic drills that will include responses to:
- Knife or gun threats
- Travel route safety and abduction related threats.
- Violence in the workplace situation - potential or actual
- Domestic violence occurring within our facilities
- General evacuation requirements due to a technical, human or natural threat
- Others may be determined by the General Manager or Security Management Committee

Threats will be qualified utilizing a threat matrix, or other tool that compares operations to threats, and their likelihood and severity. Where possible, mitigating actions and recommendations will be initiated.

3. The Role of the Security Focal Person or Manager

In the minimum, the contractor will have a security manager or focal staff that will be responsible for all security related issues in the workplace. The role of this security focal person includes:

4. Lead role in threat assessments

- Program maintenance and updates

- Incident response and coordination
- Chair of the Security Program Committee
- Training Responsibilities
- Coordination with other Departments
- Coordination with agencies and response units

5. Employee security education and training

The company-training security program will ensure:

- Employee duties and responsibilities
- Event-specific responsibilities
- Threat or event reporting
- Back-to-work/check-in requirements
- Potential disciplinary actions
- Dealing with the media, regulatory agencies, or other entities outside the company

6. Management and Supervisor Education and Training

For Managers and Supervisors, our program focuses upon:

- Individual or Department duties
- Knowledge and deployment of response protocols
- Assuring employee and other constituent welfare
- Threat or event reporting
- Back-to-work/check-in requirements
- Potential disciplinary actions
- Dealing with the media, regulatory agencies, or other entities outside the company

7. Program Exercises and Drills

The training and education activities that will be undertaken for the purposes of implementing this Security Management Plan shall be one of the following: case studies, table top exercises, or small and/or large scale exercises involving response pattern to adopt in the face of clear and present threats e.g. insurgent attacks.

The hiring of the Security Management consultant is in process under the PIU IFRAP (Component-I), the consultant will ensure that the project and contractor staff receive ESS4-specific training on human rights and use of force along with the security of the personals involved in the civil works. The consultant will work on the code of conduct for the security personnel, public security arrangements and training requirements.

ANNEXURE: U

CONTRACTORS COVID-19 COMPLIANCE GUIDELINES (SAMPLE)

1. Conduct off-site safety trainings to ensure all employees are aware of the job hazards. The emphasis of this training is on the COVID19 awareness.

2. Contractor is to carry out screening of personnel to determine if any of them is sick or showing any COVID19 related symptoms before any of them is allowed into the work site.

3. Proper education of workforce and enforcement of social distancing protocols on site. Effective social distancing practices must be included in the training plan prior to deployment of the workforce to site.

4. Education should include use of tools; Tools and equipment are not to be shared, where possible. Touch points on tools should be properly wiped down with disinfectant prior to hand over to next shift.

5. Workers are to be encouraged to wash hands comprehensively for at least 30 seconds immediately they are about to enter the worksite.

6. In addition, the following social distancing practices can be included in the workers camp:

    a. Break time can be staggered so that not all workers will be away to the canteen or eating area at the same time

    b. Use of the bathrooms and toilets need to be staggered to prevent crowding.

    c. Work hours can also be staggered to ensure no overcrowding

    d. Provision of entry and exit points from workers camp and site to ensure minimum contact during shift change.

    e. Prevention of visits from family and friends from workers camp and work site

    f. Improve access control to and from the workers camp and works site. Consider the use of personal identification cards that should be presented to grant access.

7. Education and enforcement of handwashing, sanitizing and other hygienic practices.

8. A record of who is on the work site and when needs to be available and with the shift supervisor at all times. This is so that in the event of a worker contracting COVID19, these records will be utilized to inform those who may have come into contact with this person (contact tracing).

9. Contractor to create an isolation area within the sick bay that can offer initial response.

10. Sick bay and health officers in the workers camp are to have the phone numbers and contact details of NCDC for confirmed cases that require evacuation from site.

11. Contractor should ensure the regular disinfecting and cleaning of the following surfaces several times a day; tables, chairs, doorknobs, Light switches, phones, toilets, taps and sinks.

12. Remind workforce of need to follow the protocols, especially washing of hands and to

keep common areas and tools, clean.

13. When departing the worksite, workers are to:
    a. Wash hands properly before departing site
    b. Retain PPE on site
    c. Maintain social distancing as you depart

ANNEXURE: V

TREE REPLANTATION PLAN (SAMPLE)

1. Objective

The Tree Replantation Plan aims to compensate for vegetation loss due to construction activities and to restore ecological balance in accordance with World Bank Environmental and Social Standard (ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources). The plan also supports slope stabilization, erosion control, and improvement of local microclimatic conditions.

2. Tree Inventory and Clearance

Prior to commencement of works, a detailed tree inventory will be conducted within the project footprint, documenting species, size, location, and condition of trees likely to be affected. Tree removal will be minimized through design optimization and will only be undertaken after obtaining necessary approvals from relevant Forest and Environmental Authorities.

3. Compensatory Plantation Strategy

Compensatory plantation will be carried out at a minimum ratio of **1:5 (or higher as per regulatory and World Bank requirements).** Plantation will prioritize indigenous and site-specific species with high survival rates and ecological value. The plantation will be undertaken along the bund alignment (where feasible), downstream areas, and in designated community or government land in consultation with local stakeholders and Forest Department GoB.

4. Species Selection and Plantation Design

Selection of species will be based on local agro-climatic conditions, soil characteristics, and ecological suitability. Preference will be given to native, drought-resistant, and flood-tolerant species that contribute to bank stabilization and biodiversity enhancement. Proper spacing, pit preparation, and soil conditioning will be ensured to support healthy plant growth.

5. Implementation Arrangements

The Contractor will be responsible for implementation of plantation activities, including site preparation, procurement of saplings, planting, and initial maintenance. The Project Consultants (PCs) will oversee execution and ensure compliance with approved specifications. The Project Implementation Unit (PIU) will monitor overall implementation and reporting in line with ESMP requirements.

6. Maintenance and Survival Management

A maintenance period of minimum three (03) years will be ensured, including watering, weeding, mulching, fertilization, and protection through fencing or tree guards. Dead or unhealthy saplings will be replaced to achieve a minimum survival rate of 80% or above.

7. Environmental Monitoring and Reporting

Regular monitoring will be conducted to assess plantation progress, survival rates, and overall effectiveness. Monitoring indicators will include number of trees planted, survival percentage, and health condition. The Contractor will submit periodic reports, which will be verified by the Supervision Consultant and consolidated by the PIU for submission to the World Bank.

8. Community Participation and Awareness

Local communities will be engaged in plantation activities where feasible to enhance ownership and sustainability. Awareness programs will be conducted to promote environmental conservation and protection of planted areas.

9. Budget Provision

Adequate budgetary allocation will be ensured within the ESMP for plantation, maintenance, monitoring, and replacement of saplings throughout the defined maintenance period.

ANNEXURE: W

STAKEHOLDERS ENGAGMENT PLAN (SAMPLE)

1. Introduction

This Stakeholder and Worker Consultation Plan has been prepared as an annexure to the Environmental and Social Management Plan (ESMP) for the proposed subproject. The plan provides a structured approach for informing, consulting, and engaging local communities, project-affected persons, vulnerable groups, relevant institutions, contractor workers, subcontractor workers, and other project personnel during the pre-construction, construction, and post-construction stages.

Stakeholder and worker consultation is essential for identifying environmental, social, labour, occupational health and safety, and community health and safety concerns. It also supports effective implementation of mitigation measures, improves transparency, strengthens community acceptance, and provides a clear mechanism for recording and addressing grievances.

2. Objectives

The objectives of this plan are to:

1. Identify stakeholders and workers who may be affected by or have an interest in the project.
2. Disclose project information, including project scope, construction activities, expected impacts, mitigation measures, and grievance procedures.
3. Obtain feedback from local communities, affected persons, vulnerable groups, relevant departments, and project workers.
4. Ensure meaningful participation of women, poor households, elderly persons, persons with disabilities, daily wage workers, and other vulnerable groups.
5. Consult workers on labour conditions, occupational health and safety, welfare facilities, code of conduct, and worker grievance arrangements.
6. Link community and worker consultations with the respective grievance redress mechanisms.
7. Document issues raised during consultations and incorporate relevant feedback into ESMP implementation.

3. Stakeholder and Worker Identification

The key stakeholders and workers to be consulted are summarized below.

Category	Stakeholders / Workers
Primary community stakeholders	Local communities, nearby residents, affected persons/households, farmers, land users, shopkeepers/businesses, road users, women, children, elderly persons, persons with disabilities, vulnerable households, and local labour.
Institutional stakeholders	Local administration, relevant line departments, Environmental Protection Agency, local elected representatives, community elders, NGOs/CBOs where active, health and education facilities, police/traffic authorities where relevant.
Project implementation stakeholders	Project Implementation Unit / Executing Agency, Supervision Consultant, Contractor, subcontractors, suppliers and service providers.

Category	Stakeholders / Workers
Project workers	Contractor workers, subcontractor workers, skilled and unskilled labour, drivers, machine operators, security staff, camp staff, HSE staff, community liaison staff, and other site personnel.

4. Consultation Principles

Consultations shall be carried out in accordance with the following principles:

Principle	Application
Inclusiveness	All relevant groups, including affected persons, vulnerable groups, women, and workers, shall be provided an opportunity to participate.
Transparency	Project information shall be shared in a timely, clear, and understandable manner.
Cultural appropriateness	Consultations shall be conducted in the local language and in a socially acceptable manner.
Accessibility	Meetings shall be held at suitable locations and times convenient for communities and workers.
Gender sensitivity	Separate consultations with women shall be arranged where local conditions require.
Worker protection	Workers shall be allowed to raise concerns related to working conditions, safety, welfare, and grievances without retaliation.
Documentation	All meetings, issues raised, responses provided, and agreed actions shall be properly recorded.
Feedback integration	Relevant feedback shall be reviewed and incorporated into ESMP implementation, where appropriate.

5. Consultation Methods

The following methods shall be used depending on the stakeholder group, project stage, and nature of issues to be discussed.

Method	Purpose
Community meetings	Disclosure of project information and collection of feedback from local communities and affected persons.
Focus group discussions	Consultation with specific groups such as women, farmers, youth, vulnerable persons, local labour, or businesses.
Key informant interviews	Consultation with community elders, local representatives, government officials, teachers, health workers, and other informed persons.
Household consultations	Consultation with directly affected or vulnerable households who may not be able to attend public meetings.
Site meetings	Discussion of site-specific issues such as access, traffic, safety, dust, noise, spoil disposal, utility disruption, and temporary disturbance.
Worker induction sessions	Orientation of workers on ESMP requirements, OHS, PPE, code of conduct, emergency response, labour rights, and worker grievance procedure.
Toolbox talks / safety meetings	Regular communication with workers on activity-specific risks, safe work procedures, traffic safety, waste management, and incident reporting.
Awareness sessions	Information sharing with communities and workers on traffic safety, GBV/SEA/SH, GRM, OHS, waste management, and emergency response.
Information boards / notices	Disclosure of project details, construction schedule, safety instructions, contact persons, and grievance procedure.

6. Key Consultation Topics

6.1 Environmental Issues

Consultations with communities, local representatives, institutions, and workers shall cover the following environmental issues, as applicable:

- Dust generation and water sprinkling requirements.
- Noise and vibration from construction machinery and vehicles.
- Waste collection, segregation, handling, and disposal.
- Handling of fuel, oils, lubricants, and minor hazardous waste.
- Protection of water bodies, drains, irrigation channels, agricultural land, and community assets.
- Erosion control, spoil disposal, borrow areas, and site restoration.
- Tree cutting, vegetation disturbance, and restoration measures, where applicable.

6.2 Social and Community Issues

Community consultations shall cover the following social issues:

- Community health and safety during construction.
- Traffic management, access restrictions, and movement of machinery.
- Temporary disturbance to houses, shops, fields, roads, public facilities, or services.
- Employment opportunities for local labour.
- Labour influx and worker behaviour.
- Code of conduct for workers and site staff.
- Protection of women, children, elderly persons, and vulnerable groups.
- GBV/SEA/SH awareness and confidential complaint handling.
- Grievance Redress Mechanism for communities.
- Damage to private, public, or community assets, if any.

6.3 Worker Issues

Worker consultations shall cover the following:

- Terms and conditions of employment, wages, working hours, rest periods, leave, and payment arrangements.
- Occupational health and safety risks associated with assigned work.
- Use of personal protective equipment and safe work procedures.
- Emergency response, first aid, accident reporting, and incident investigation.
- Worker accommodation, sanitation, drinking water, rest areas, and welfare facilities, where applicable.

- Code of conduct, respectful behaviour, prevention of harassment, and GBV/SEA/SH awareness.
- Waste management, housekeeping, site access control, and traffic safety.
- Availability of a worker grievance mechanism.
- Right of workers to raise concerns without intimidation, discrimination, or retaliation.

7. Stakeholder and Worker Consultation Schedule

Project Stage	Stakeholders / Workers	Method	Key Topics	Frequency / Timing	Responsibility
Pre-construction	Local communities, affected persons, community elders, local representatives	Community meeting	Project scope, benefits, construction schedule, expected impacts, mitigation measures, community GRM	Before start of works	PIU / Supervision Consultant / Contractor
Pre-construction	Women, vulnerable households, elderly persons, persons with disabilities	FGD / household consultation	Access, safety, social concerns, gender issues, vulnerable group concerns, grievance process	Before start of works	Social Specialist / Community Liaison Officer
Pre-construction	Local administration and line departments	Coordination meeting	Permissions, traffic arrangements, utility coordination, public safety, emergency response	Before mobilization	PIU / Supervision Consultant
Pre-construction	Contractor workers, subcontractor workers, drivers, machine operators, security staff, camp staff	Worker induction / orientation	ESMP, OHS, PPE, code of conduct, emergency response, labour conditions, worker GRM, GBV/SEA/SH	Before deployment at site	Contractor / HSE Officer
Construction	Communities near active work sites	Community/site meetings	Dust, noise, access, traffic, safety, construction schedule, complaints	Monthly or as required	Contractor / Community Liaison Officer
Construction	Directly affected households, land users, road users, businesses	Household visit / site meeting	Temporary impacts, access arrangements, damages, restoration, traffic management	As required	Contractor / Supervision Consultant
Construction	Women and vulnerable groups	Separate FGD / targeted consultation	Safety, mobility, labour influx, harassment risks, access to GRM	Quarterly	Social Specialist / Community Liaison Officer
Construction	Contractor and subcontractor workers	Toolbox talks / safety meetings	OHS, PPE, activity-specific risks, first aid, emergency response, waste management, traffic safety	Monthly and before high-risk activities	Contractor / HSE Officer
Construction	Workers and camp staff, where applicable	Worker consultation / welfare meeting	Working conditions, accommodation, sanitation, drinking water, rest areas, complaints, worker welfare	Monthly or as required	Contractor / HSE Officer
Construction	Local administration / relevant departments	Coordination meeting	Traffic, utilities, public complaints, emergency response, law and order	Quarterly or as required	PIU / Supervision Consultant

Project Stage	Stakeholders / Workers	Method	Key Topics	Frequency / Timing	Responsibility
Post-construction	Local communities and representatives	Feedback meeting	Site restoration, residual impacts, pending grievances, project benefits	After completion of works	PIU / Supervision Consultant
Post-construction	Workers demobilized from site	Exit briefing / worker feedback	Final payments, grievance closure, safety close-out, return of camp/site facilities	At demobilization	Contractor
Post-construction	O&M agency / line department	Handover meeting	O&M-stage environmental and social responsibilities, unresolved issues, monitoring needs	At handover	PIU / O&M Agency

8. Consultation with Vulnerable Groups

Special attention shall be given to vulnerable and disadvantaged groups, including poor households, female-headed households, elderly persons, persons with disabilities, landless labourers, daily wage workers, and households living close to active construction areas.

The following measures shall be adopted:

1. Separate consultations shall be arranged where mixed public meetings may restrict participation.
2. Consultations shall be conducted in the local language.
3. Meeting venues shall be easily accessible and selected in consultation with the community.
4. Female participation shall be facilitated through female staff or local women facilitators, where required.
5. Views of vulnerable groups shall be separately recorded and considered in ESMP implementation.
6. Grievance registration shall be accessible, confidential where needed, and free from retaliation.
7. Project information shall be explained verbally where literacy levels are low.

9. Consultation with Workers

Workers engaged by the Contractor, subcontractors, suppliers, and service providers shall be treated as key project stakeholders. Worker consultation shall be carried out to identify and address labour-related risks, occupational health and safety issues, workplace concerns, welfare matters, and grievances during implementation.

Worker consultations shall be conducted through induction sessions, toolbox talks, safety meetings, awareness sessions, camp/welfare meetings, and confidential discussions where required. These consultations shall explain workers' responsibilities, rights, working conditions, health and safety requirements, code of conduct, emergency procedures, and access to the worker grievance mechanism.

The Contractor shall ensure that workers are informed about the following:

- Nature of assigned work and associated safety risks.

- Requirement to use PPE and follow safe work procedures.
- Availability of first-aid, emergency response, and accident reporting arrangements.
- Working hours, wage payment arrangements, rest breaks, and leave procedures.
- Site rules, camp rules, sanitation arrangements, drinking water, and welfare facilities.
- Prohibition of harassment, child labour, forced labour, discrimination, and misconduct.
- Worker grievance mechanism and confidential reporting channels.
- Right to raise workplace concerns without retaliation.

A separate worker grievance register shall be maintained at the project site. Sensitive complaints, including harassment or GBV/SEA/SH-related matters, shall be handled confidentially and referred to appropriate channels in accordance with the project's labour management and GBV/SEA/SH procedures.

10. Roles and Responsibilities

Institution / Person	Key Responsibilities
Project Implementation Unit / Executing Agency	Overall responsibility for stakeholder engagement, information disclosure, grievance redress, and incorporation of consultation feedback into ESMP implementation.
Environmental Specialist	Explain environmental impacts and mitigation measures, support environmental consultations, and assist in compliance monitoring.
Social Safeguards & Gender Specialist	Conduct social consultations, vulnerable group consultations, gender consultations, GRM awareness, and social impact monitoring.
Supervision Consultant	Supervise consultation activities, verify records, monitor implementation of agreed actions, and report compliance.
Contractor	Conduct site-level community and worker consultations, inform communities about construction schedules, maintain information boards, implement mitigation measures, and support grievance resolution.
HSE Officer	Conduct worker induction, toolbox talks, OHS awareness, emergency response drills, safety inspections, and accident reporting.
Community Liaison Officer	Maintain regular contact with communities, register complaints, support consultations, and assist in resolving local issues.
Worker Representative / Site Supervisor	Communicate worker concerns to Contractor management and support implementation of safety and welfare measures.
Local administration / community elders	Support community coordination, public meetings, local dispute resolution, and dissemination of information.

11. Information Disclosure

Project information shall be disclosed in a simple, understandable, and locally appropriate manner. Information shall be provided to communities, workers, and relevant institutions through meetings, notices, information boards, verbal briefings, and coordination with local representatives.

The following information shall be disclosed:

- Project name, location, and scope of works.

- Construction schedule and major activities.
- Expected environmental, social, and safety impacts.
- Mitigation measures proposed in the ESMP.
- Community health and safety precautions.
- Traffic and access management arrangements.
- Worker code of conduct and labour behaviour requirements.
- Community Grievance Redress Mechanism.
- Worker grievance mechanism.
- Contact details of responsible project staff.

Information boards shall be installed at visible locations near the work site and shall include emergency contact numbers, grievance focal person details, safety instructions, and basic project information.

12. Grievance Redress Linkage

The consultation process shall be linked with both the community Grievance Redress Mechanism and the worker grievance mechanism.

12.1 Community Grievance Mechanism

Communities and affected persons shall be informed about:

1. How and where to submit complaints.
2. Name and contact of the grievance focal person.
3. Expected timeline for complaint resolution.
4. Escalation procedure if the complaint is not resolved at site level.
5. Confidential handling of sensitive complaints, including GBV/SEA/SH-related matters.
6. Assurance that complaints can be submitted without fear of retaliation.

12.2 Worker Grievance Mechanism

Workers shall be informed about:

1. How to submit labour, wage, safety, welfare, or workplace-related complaints.
2. Availability of confidential reporting for sensitive issues.
3. Timelines for review and resolution.
4. Protection against retaliation for raising concerns.
5. Escalation procedure if complaints are not resolved by the Contractor.

Separate registers shall be maintained for community grievances and worker grievances. Each register shall include complaint number, date, complainant details if provided, nature of complaint, action taken, responsible person, resolution date, and status.

13. Documentation and Reporting

All consultation activities shall be documented and included in monthly or periodic ESMP compliance reports. Records shall include:

- Date, time, and venue of consultation.
- Type of consultation.
- List of participants, with gender-disaggregated data where possible.
- Worker category and number of workers consulted, where applicable.
- Photographs, where appropriate.
- Key issues raised.
- Responses provided by the project team.
- Agreed actions and responsible persons.
- Follow-up requirements.
- Status of community and worker grievances.
- Corrective actions taken.

The Supervision Consultant shall verify consultation records during site inspections and include consultation progress in ESMP compliance reporting.

14. Consultation Record Format

Item	Details
Project name	
Location / village / worksite	
Date and time	
Type of consultation	Community meeting / FGD / KII / household consultation / worker consultation / toolbox talk / site meeting
Participants	Men: ___ Women: ___ Workers: ___ Total: ___
Stakeholder / worker group	Community / affected persons / women / vulnerable group / workers / local administration
Main issues discussed	
Concerns raised	
Response provided	
Agreed actions	
Responsible person	
Timeline for action	
Follow-up required	Yes / No
Prepared by / signature	

15. Attendance Sheet Format

Sr. No.	Name	Designation / Village / Worker Category	Gender	Contact No.	Signature / Thumb Impression
1					
2					

Sr. No.	Name	Designation / Village / Worker Category	Gender	Contact No.	Signature / Thumb Impression
3					
4					
5					

16. Monitoring Indicators

Indicator	Frequency	Responsibility
Number of community consultation meetings conducted	Monthly / quarterly	Social Specialist / Community Liaison Officer
Number of participants consulted, including women and vulnerable persons	Each consultation	Community Liaison Officer
Number of worker induction sessions conducted	At mobilization and new hiring	Contractor / HSE Officer
Number of toolbox talks and safety meetings conducted	Monthly / activity-based	Contractor / HSE Officer
Number of community grievances received and resolved	Monthly	Contractor / PIU
Number of worker grievances received and resolved	Monthly	Contractor / HSE Officer
Number of awareness sessions on OHS, GRM, traffic safety and GBV/SEA/SH	Monthly / quarterly	HSE Officer / Social Specialist
Public information boards installed and maintained	Monthly verification	Contractor
Consultation records included in ESMP reports	Monthly	Supervision Consultant

17. Budget Provision

The cost of stakeholder and worker consultation has been included under the ESMP budget heads for community consultation and GRM, worker awareness, social and environmental impact monitoring, training and capacity building, documentation, and community liaison support.

The budget shall cover meeting arrangements, local travel, communication, printing of notices, worker induction materials, awareness sessions, photographic documentation, grievance documentation, and follow-up consultations. Costs related to worker safety training, PPE awareness, toolbox talks, and worker welfare communication shall be included in the Contractor's ESMP implementation obligations.

ANNEXURE: X

PICTORIAL RECORD OF CONSULTATION MEETINGS WITH COMMUNITY ELDERS AND MEMBERS

Rabi canal -1

Rabi canal -1

Rabi canal -2

Rabi canal -2

Kashk Abad

Kaskh Abad

Institutional Consultations Pictures

Institutional Consultations with different distrct officials

ANNEXURE: Y

WORK PLAN FOR IMPLEMENTATION OF RESTORATION/STRENGTHENING OF FLOOD EMBANKMENT OF MAIN RABI CANAL