

PROJECT IMPLEMENTATION UNIT (PIU) (IFRAP)



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

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)



PACKAGE-VI

RESTORATION OF DAMAGES TO ESCAPE CHANNEL & AKBAR MINOR ALONG WITH STRUCTURES, DISTRICT JHAL MAGSI

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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 Restoration of Damages to Escape Channel & Akbar Minor along with structures in District Jhal Magsi is one of the sub-projects being implemented under Package-VI of IFRAP to protect local settlements and agricultural lands from recurrent flood events.

The Restoration of Damages to Escape Channel & Akbar Minor along with structures lies near villages Rasool Abad, Panchpai Jadeed, Bugti Ghot, Nushki Jadeed, Ahmad Abad, Gandakha baal at coordinates 28°06'56.44"N 67°44'10.90"E. The proposed restoration of damaged channels and structures at Akbar Minor consists, approximately the longest stream of 15.91 meters in length, designed to protect the area from floodwaters originating from the Kachhi plain basin and its tributaries.

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 Jhal Magsi 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 Restoration of Damages to Escape Channel & Akbar Minor along with structures site lies within the Kachhi plain basin, characterized by semi-arid climate, low vegetation, and periodic flash floods from hill torrents. 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 disruption of community access, village-road movement, farm access and informal crossings may occur near Super Passage No. 5, Super Passage No. 7 and the Village Road Bridge on Akbar Khan Minor; the Contractor shall maintain safe temporary access, provide alternative routes/crossings, install warning signage and flag persons, and issue advance public notices to nearby villages.

Potential water-user concerns, including perceived interruption of irrigation flows or disputes between upstream and downstream users, have been assessed. The subproject will restore existing infrastructure only and will not change established water allocations; nevertheless, construction scheduling, consultations with irrigation beneficiaries and the project GRM shall be used to prevent and resolve water-use complaints.

- 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:

Sediment and silt removed from the Escape Channel and Akbar Khan Minor shall be visually screened and assessed for reuse. Where staining, odour, oil films, unusual colour, nearby fuel handling, or other contamination indicators are observed, the Contractor shall undertake sediment testing before reuse or disposal, including pH, electrical conductivity, oil and grease/TPH, total suspended solids and selected metals (As, Cd, Cr, Pb and Hg), as applicable.

- 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.

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 of PKR 3,236,156 will be integrated into the overall project budget to ensure sustainable and compliant implementation.

9. CONCLUSION

The Restoration of Damages to Escape Channel & Akbar Minor along with structures represents a critical intervention for enhancing flood resilience and protecting vulnerable communities in Jhal Magsi 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. The interventions aim not only to rehabilitate damaged assets but also to integrate climate-resilient design standards capable of withstanding future extreme hydrological events.

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.

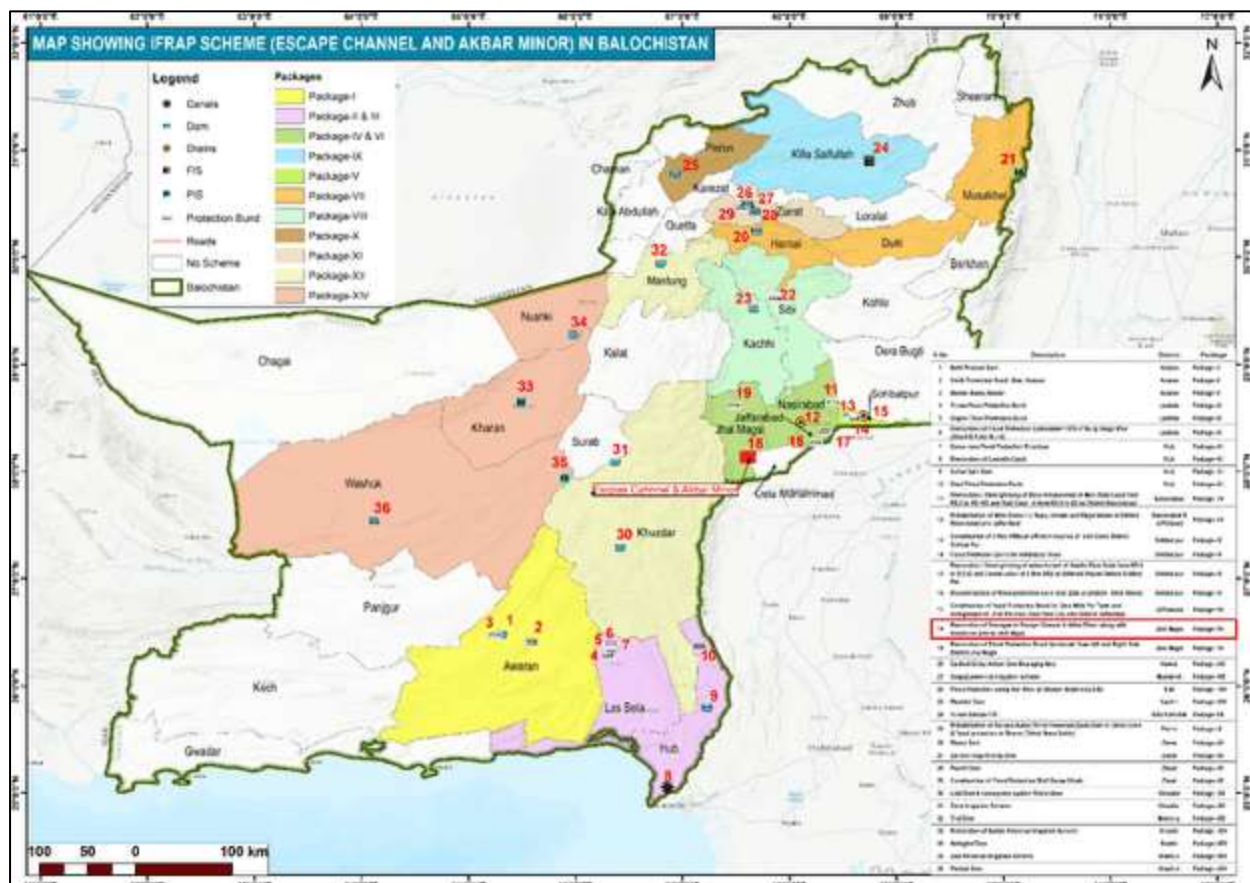


Figure 1-1: Location map showing the sites of sub-projects

1.4 OBJECTIVES OF ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN (ESMP)

The Environmental and Social Management Plan (ESMP) has been prepared in compliance with Bank's Environmental and Social (E&S) Safeguard 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	Planned 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 proposed sub-project Restoration of Damages to Escape Channel & Akbar Minor along with structures lies in district Jhal Magsi located at coordinates 28°06'56.44"N 67°44'10.90"E. The nearby villages Rasool Abad, Panchpai Jadeed, Bugti Ghot, Nushki Jadeed, Ahmad Abad, Gandakha baal. The nearest village Gandakha Baal is 0.5 Km away from the subproject area, details are given in table 1.2. The proposed scheme of Escape Channel & Akbar Minor, is culvert with a proposed length of 4.50 meter and 4.35 meter width. The nearest village is located approximately 0.5 km from the sub-project area.



Figure 1-2: Map showing proximity to the project site

Table 1-2 Details & Distance of villages from Akbar Minor and Escape Channel Structures

Sr. #	Village(s)	Households	Population	Distance from the Subproject Area (Km)
1	Rasool Abad	100	700	6.0
2	Nushki Jadeed	600	4200	8.0
3	Ahmad Abad	800	5600	4.0
4	Panchpai Jadeed	171	1100	3.0
5	Bugti Goth	900	6300	1.0
6	Ghandakha Baal	400	3000	0.5
	Total	2,971	20,900	—

The subproject is intended for rehabilitation and strengthening of existing flood/irrigation structures along the Escape Channel and Akbar Khan Minor to improve hydraulic continuity, reduce flood damage risk, and protect adjoining agricultural lands and nearby settlements. The interventions will remain within the existing disturbed footprint to the extent practicable and will promote sustainable land use and socio-economic resilience of local communities. The proposed subproject does not lie within or adjacent to any protected area, conservation area, wetland, legally notified buffer zone or other environmentally sensitive area. The damage is shown in the site photographs in Figure 1-4.

A downstream flood-risk and structure/approach-failure scenario has been assessed for the restored super passages and Akbar Khan Minor crossing. If flood flows exceed design capacity, or if blockage, scour, wing-wall/apron damage or approach failure occurs, localized flooding, backwater effects, erosion and temporary access disruption may affect adjoining agricultural land, access tracks and nearby settlements. Mitigation includes climate-resilient design, hydraulic continuity during works, routine inspection, maintenance, emergency response procedures, community alerts and post-flood monitoring.

1.7 PROPOSED ACTIVITIES

The proposed intervention includes the rehabilitation of the Escape Channel and Akbar Khan Minor along with associated structures located in District Jhal Magsi, to enhance hydraulic performance and restore structural stability. The rehabilitation works will involve repair and strengthening of damaged hydraulic structures, reconstruction of deteriorated components, and provision of protective measures to safeguard against future flood events. These activities aim to reinstate the functional efficiency of the irrigation and drainage system, ensure safe water conveyance, and maintain uninterrupted connectivity in the project area.

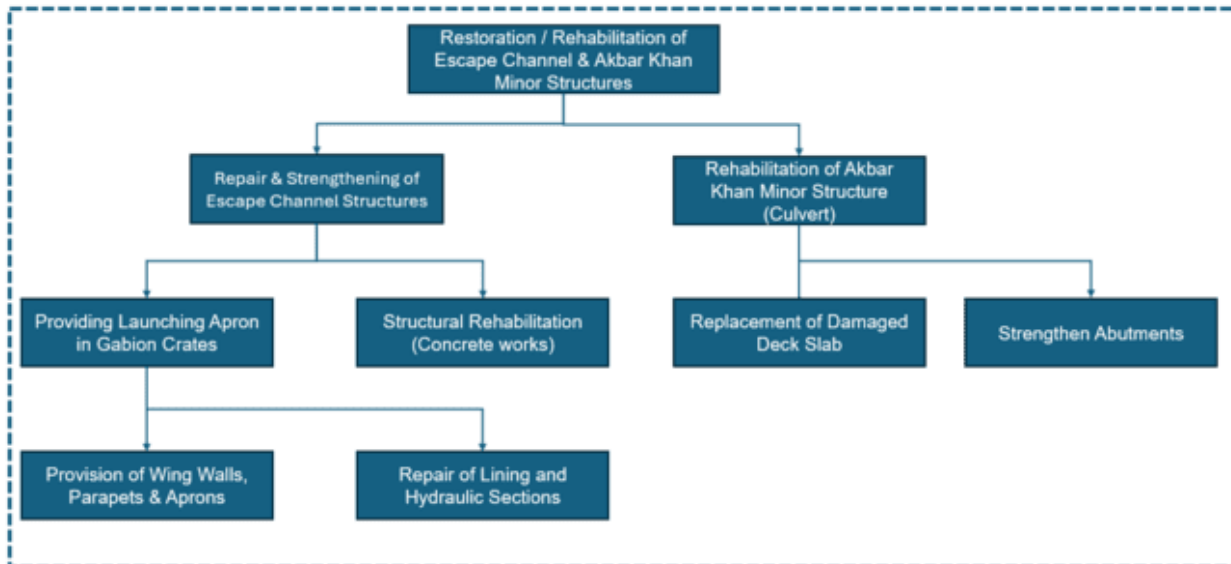


Figure 1-3: Project Activities

The following works have been proposed to restore and enhance the operational efficiency of the Escape Channel and Akbar Khan Minor irrigation and drainage system:

1.7.1 Escape Channel Structures

The Escape Channel structures include the restoration of existing super passages situated along the channel alignment, designed to safely convey design discharge and maintain hydraulic continuity. The rehabilitation works comprise reconstruction of eroded approaches, repair of damaged lining, and structural strengthening using concrete works. Additional protective measures such as provision of wing walls, parapets, and aprons will be implemented to improve durability and resistance against high-flow conditions.

Two super passages located at RD 4+800 (Super Passage #5) and RD 7+300 (Super Passage #7), each having a length of 51.8 m, width of 15.50 m, height of 2.50 m, and discharge capacity of 3942 cusecs, are currently in deteriorated condition and require comprehensive rehabilitation to restore their operational performance.

1.7.2 Akbar Khan Minor Structure

The Akbar Khan Minor structure includes the rehabilitation of an existing village road bridge (culvert) located at RD 3+120, constructed over the minor channel to facilitate local connectivity. The rehabilitation works involve replacement of the damaged deck slab, strengthening of abutments, and repair and protection of wing walls to ensure structural integrity and safe passage of traffic.



Figure -1-4: Photographs of damaged Super Passages

Table 1-3: List of Construction Activities

Sr. No	Work Activities	List of Associated Construction Activities
1	Pre-construction activities	• Joint survey by Consultant and Contractor teams • Identification of damaged structures and assessment of existing conditions • Selection of suitable sites for contractor camp and material storage • Establishment of contractor camp • Deployment of technical staff and workforce • Mobilization of machinery, equipment, and materials
2	During Construction Activities	• Site clearance and removal of debris/silt from affected structures • Dismantling of damaged structural components (super passage, culvert, approaches)

Sr. No	Work Activities	List of Associated Construction Activities
		• Reconstruction of eroded approaches and embankments • Repair and rehabilitation of super passage structures (concrete works, lining repair) • Provision of wing walls, parapets, and aprons for super passages • Rehabilitation of village road bridge (deck slab replacement, abutment strengthening) • Repair and protection of wing walls and side slopes • Concrete works including casting, curing, and finishing • Earthwork excavation and backfilling • Installation of protective works to prevent erosion and scouring

1.8 Workplan / Implementation Schedule of ESMP

The implementation schedule for the Integrated Flood Resilience and Adaptation Project (IFRAP): Package VI: Restoration of Damages to Escape Channel Akbar Minor along with Structures, District Jhal Magsi, 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 (18) months**. The work plan encompasses procurement, contractor mobilization, restoration and reconstruction works, implementation of Environmental and Social Management Plan (ESMP) measures, environmental and social monitoring and reporting, quality assurance documentation, project deliverables, and close-out activities.

The implementation schedule has been developed to ensure integrated execution of engineering rehabilitation works and environmental and social safeguard activities throughout the project lifecycle, in accordance with the World Bank Environmental and Social Framework (ESF) and the Project's Environmental and Social Commitment Plan (ESCP). Environmental compliance, occupational health and safety measures, community protection protocols, hydraulic continuity maintenance obligations, and ESMP monitoring and reporting obligations shall remain active and continuously enforced during all stages of construction, completion, and handover.

1.8.1 Bidding and Contract Award

This phase comprises procurement and contract administration activities including preparation and issuance of tender documents, tender floating, pre-bid meetings, receipt of bids, technical and financial evaluation, approval process, contract award, signing of the contract agreement, and issuance of Notice to Commence, in accordance with applicable procurement procedures and project implementation requirements. ESMP provisions, Environmental Codes of Practice (ECoPs), Occupational Health and Safety (OHS) requirements, and all applicable environmental and social obligations shall be incorporated into the contract documents before issuance, ensuring that the Contractor's obligations are contractually binding from the outset.

1.8.2 Contractor Mobilization

Mobilization activities include deployment of key technical, environmental, and social personnel; mobilization of construction machinery and equipment; establishment of site offices, labour camps, storage yards, construction material staging areas, and on-site material testing laboratory facilities; preparation of the site-specific Contractor's ESMP (C-ESMP) including all required sub-plans (OHS Plan, Waste Management Plan, Traffic Management Plan, Labour Influx Plan, Camp Management Plan, Security Management Plan, and Emergency Response Plan); pre-construction condition assessment survey of Super Passage 5 (RD 4800) and Super Passage 7 (RD 7300) on the Escape Channel, and the Village Road Bridge at RD 3120 of Akbar Khan Minor; and completion of pre-mobilisation community consultations with affected

communities in the project influence area, including Gandakha Baal, Bugti Goth, Panchpai Jadeed, Ahmad Abad, Nushki Jadeed, and Rasool Abad, District Jhal Magsi. This phase ensures operational and environmental readiness of all resources before commencement of restoration works.

1.8.3 Restoration of Damages to Escape Channel and Akbar Khan Minor along with Structures

1.8.3.1 Super Passage Works: Escape Channel (SP-5 at RD 4800 and SP-7 at RD 7300)

Excavation Works: Excavation and removal of damaged materials, foundation preparation, dewatering where required, disposal of unsuitable material, and preparation of working areas for reconstruction of Super Passage components at RD 4800 (Super Passage 5) and RD 7300 (Super Passage 7) on the Escape Channel. Each super passage is 51.8 m long, 15.50 m wide, and 2.50 m in height, with a design discharge capacity of 3,942 cusecs. Excavation activities shall be carried out in accordance with approved drawings and technical specifications. Hydraulic continuity of the Escape Channel shall be maintained at all times through temporary bypass or staged construction sequencing.

RCC Structural Works: Execution of reinforced cement concrete works including foundation concrete, walls, slabs, wing walls, transition sections, parapets, apron protection, reinforcement fixing, concrete placement, curing, and finishing works for full rehabilitation and reconstruction of both Super Passage structures damaged during the 2022 flood events and subsequent deterioration.

1.8.3.2 Restoration of Village Road Bridge (VRB) at Akbar Khan Minor (RD 3120)

Excavation Works: Dismantling of damaged portions, excavation for foundations, earth removal, preparation of structural bases, and associated site development works required for restoration of the Village Road Bridge / Culvert at RD 3120 of Akbar Khan Minor. Traffic management and alternative access arrangements for local road users shall be maintained throughout this phase.

RCC Structural Works: Rehabilitation and reconstruction including reinforced concrete foundations, abutments, walls, deck slab replacement, control structures, concrete protection works, wing wall repair and protection, and associated structural elements required to restore the VRB to full structural integrity, safe traffic-bearing capacity, and hydraulic performance.

1.8.4 Environmental and Social Management Plan (ESMP) Implementation

ESMP implementation shall be a **continuous activity throughout the entire 24-month project duration**. Activities include dust suppression and air quality control, construction waste collection, handling and disposal, occupational health and safety compliance, environmental and safety trainings for the workforce, noise mitigation measures during construction, ambient air quality and water quality monitoring, community consultations, implementation and documentation of the Grievance Redress Mechanism (GRM), hydraulic continuity monitoring during structure rehabilitation, and monthly ESMP compliance monitoring and reporting to ensure adherence with environmental and social safeguard requirements in accordance with the World Bank ESF and ESCP.

1.8.5 Project Deliverables and Reporting

Project deliverables include submission of shop drawings, the site-specific ESMP documentation, quality control plans, construction methodology documents, material testing reports, and C-ESMP sub-plans for approval. Monthly and quarterly progress reports shall be prepared throughout project implementation, followed by preparation and submission of the final

completion report at the end of construction activities. Environmental monitoring and reporting activities shall continue throughout the 24-month implementation period to ensure compliance with environmental safeguard requirements and approved ESMP provisions. The tentative workplan activity schedule for implementation of ESMP measures is provided at **Annexure-Y**.

1.8 STUDY TEAM

Table 1-4: Consultant's Team

Sr. No.	Name	Position
1	Mr. Alamgir Khan	Project Coordinator-CAMEOS Consultant
2	Mr. Idrees Khan	Environment specialist
3	Mr. Sanaullah Khan	Water Management Specialist
4	Mr. Shoaib Suleman	Design Engineer
5	Ms. Almas Khurshid	Environmental Specialist
5	Mr. Naqeeb Ullah	Social Specialists
	Mr. Shakoor Kakar	Socio Economic baseline and Consultations
6	Ms. Sidra	Gender Specialist
7	Mr. Zarak Khan	Environment field staff (Baseline Data collection)
8	Waqar Ahmed	Surveyor
9	Mr. Safdar Chana	Environmental Baseline Monitoring's

2

LEGAL AND POLICY FRAMEWORK

2. LEGAL AND POLICY FRAMEWORK

2.1 LEGAL AND APPLICABLE REQUIREMENTS

ESMP is developed as per the World Bank Environment and Social frameworks-ESF, 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 (ESSs) 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), Pakistan Environmental Protection Act, 1997, 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: World Bank ESSs

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 highlight to consider the environmental and social risks and impacts associated with primary suppliers and disadvantaged or vulnerable groups while the local relevant laws do not. 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 and road safety hazards,	• Balochistan Occupational Safety and Health Act, 2022 • Pakistan Penal Code, 1860 • National Disaster Management Act, 2010 • Balochistan Environmental Protection Act, 2012	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 comparison to ESS-4.	Relevant measures have been included in the ESMF to ensure the compliance with ESS4 that community health and safety is adequately protected.

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
	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.			
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 Drives/forced evictions along with relevant	- 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
	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 1: Community Infrastructure Rehabilitation 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 Sub-project 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 includes 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 Restoration of Damages to Escape Channel & Akbar Minor along with structures under Package – VI of IFRAP.

3.1 LOCATION OF SUB-PROJECT

Restoration of Damages to Escape Channel & Akbar Minor along with structures is located in Jhal Magsi District. Location map of Restoration of Damages to Escape Channel & Akbar Minor along with structures is shown in Figure 3.1.

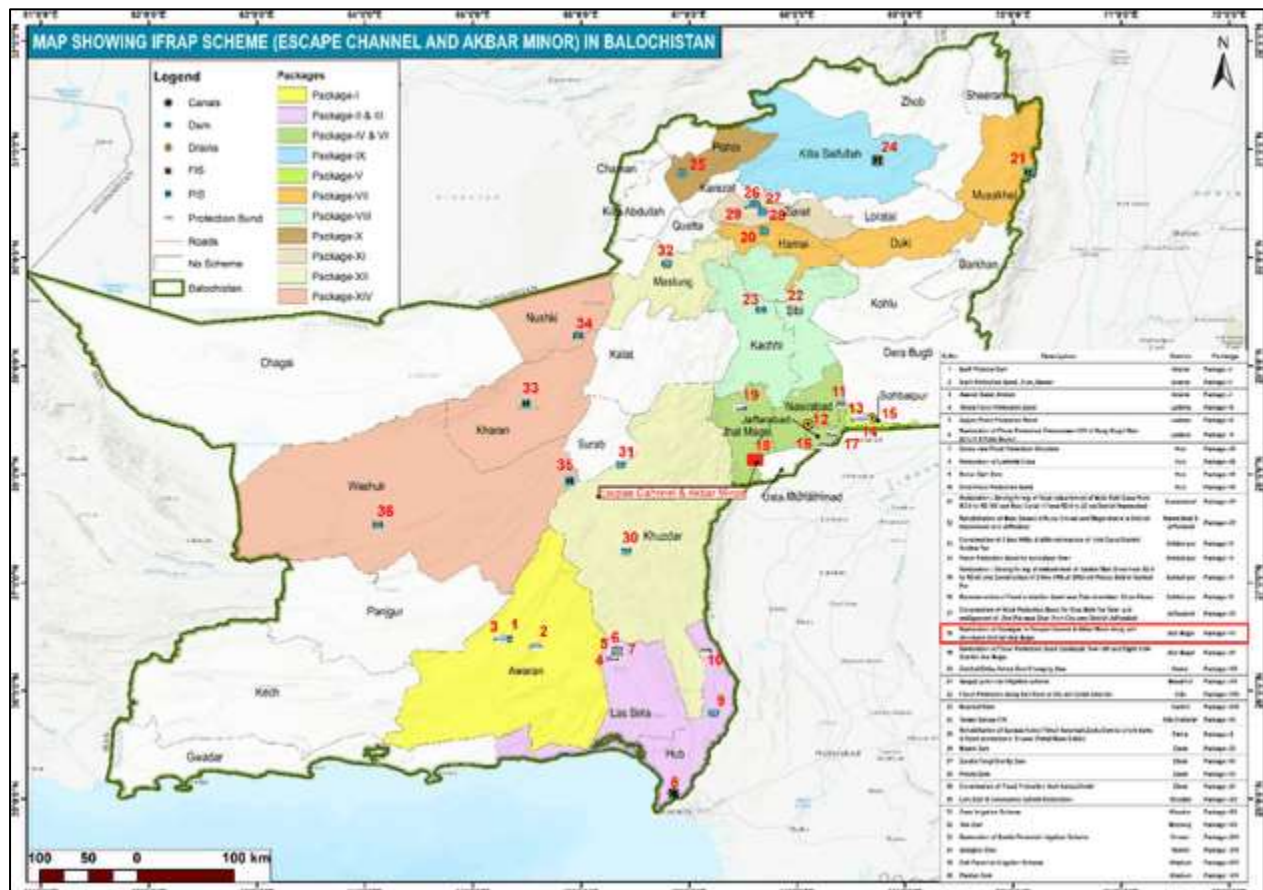


Figure-3-1: Location Map of Akbar Minor and Escape Channels

3.2 GEOLOGY

Geologically, the project area, which includes the site of Akbar minor, lies within the Kachhi plain Trough tectonic zone. This trough is a prominent structural depression in southwestern Balochistan, representing a foredeep basin formed due to regional compressional tectonics. The Kachhi plain trough is bounded by the Makran Coastal Trough towards the southwest and the Khude Range Fold Belt towards the northeast.

The regional geology reflects a complex tectonic setting shaped by the interaction of the Indian Plate and Eurasian Plate, leading to the development of ophiolitic belts, fold-and-thrust belts, and flysch zones. To the west of the project area, the Makran Coastal Trough is characterized by deep marine sediments and tectonic accretionary prisms, while the Bela Ophiolite Belt occurs nearby, representing remnants of obducted oceanic lithosphere. Furthermore, the Chaman-Nal Ornach Fault and Flysch Zone, located northeast of the project area, is a major tectonic boundary accommodating significant crustal displacement.

Overall, the project area falls in a geologically dynamic region influenced by foreland basin development, tectonic deformation, and ophiolitic emplacement, making it an integral part of the western tectonic framework of Pakistan.

3.3 RESTORATION OF DAMAGES TO ESCAPE CHANNEL AND AKBAR KHAN MINOR ALONG WITH STRUCTURES, DISTRICT JHAL MAGSI

3.3.1 Scope of Works

This component targets the rehabilitation and restoration of flood-damaged irrigation and drainage structures to restore their functionality and structural integrity. The sub-components include.

Restoration of Super Passage at Escape Channel:

Repair and strengthening of the existing super passage structure to reinstate its capacity for carrying design discharge safely. Works include reconstruction of eroded approaches, lining repair, and structural concrete rehabilitation.

Restoration of Village Road Bridge at Akbar Khan Minor:

Rehabilitation of the damaged village road bridge over Akbar Khan Minor, including replacement of the deteriorated deck slab, abutment strengthening, and protection of wing walls to ensure structural safety and uninterrupted traffic flow.



Figure-3-2: Alluvial/riverbed deposits along the washed-out Channel.



Figure-3-3: Alluvial deposits (Clayey Silt, Silty Clay and Gravelly Silt) along the sub-project site

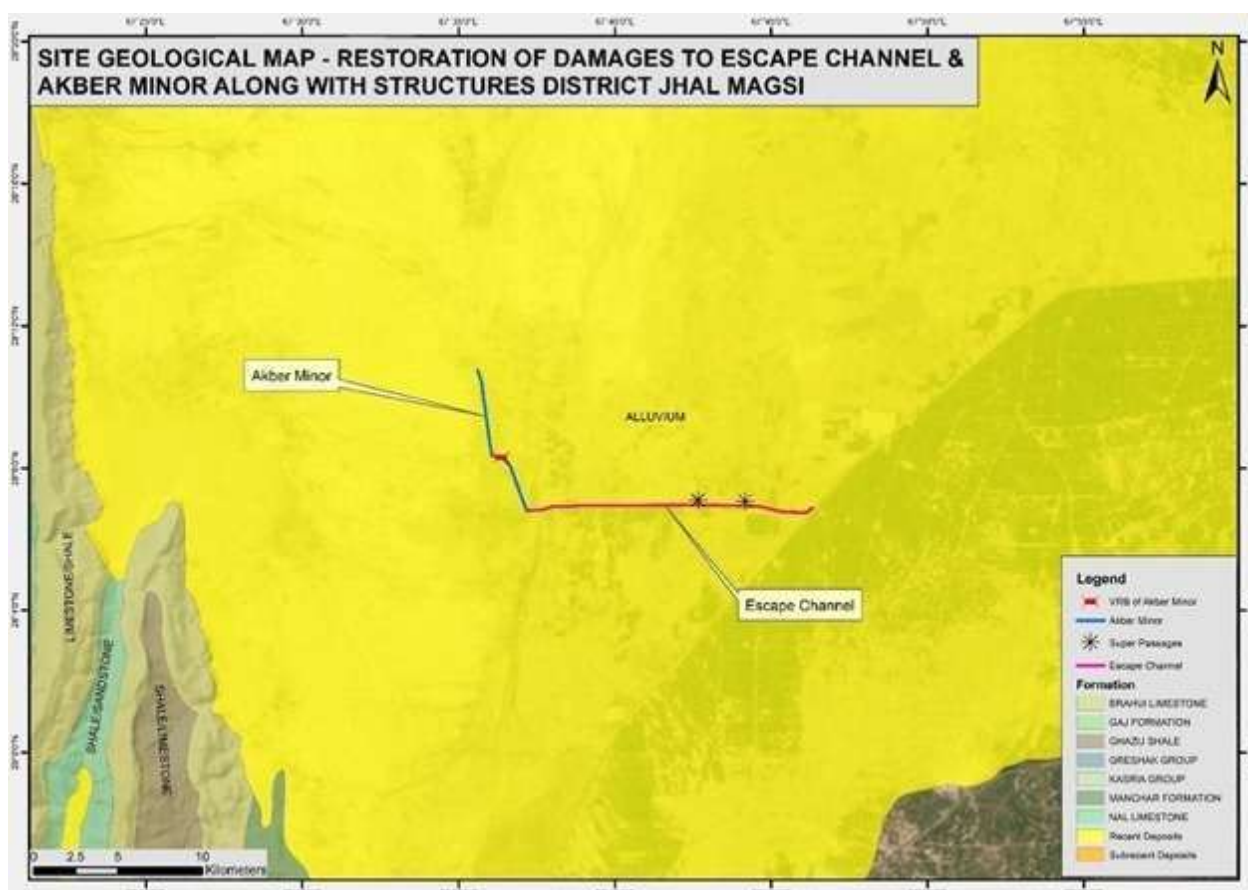


Figure 3-4: Surface geological map of the proposed structures.

3.4 DESIGN CRITERIA

Table 3-1: Design Parameters of Akbar Minor and Escape Channels

Sr. No.	Parameters	Findings
1	Catchment area (Sq. Km)	4450
2	Longest stream length (m)	219

Sr. No.	Parameters	Findings
3	Slope	0.0057
4	Crest width (m)	6.0
5	River side slope	2:1
6	Land side slope	2:1
7	Gabion Protection slope thickness (m)	0.75
8	Geotextile below Gabion (microns)	40
9	Scour depth	3.20
10	Silt factor	4.75

For the Subproject, the following design criteria shall be applied.

Codes and Practices (Design):

- USACE EM 1110-2-1913 Design and Construction of Levees
- USACE EM 1110-2-2300 General Design and construction considerations for Earth & Rock-Fill Dams
- USACE EM 1110-2-1911 Construction Control for Earth and Rock-Fill Dams
- USACE EM 1110-2-1901 Seepage Analysis and Control for Dams
- USACE EM 1110-2-1902 Slope Stability
- USBR Design Standard No. 13, Chapter 2 & 4 Embankment Dams: Design and Material Selection
- FEMA Technical Manual – Filters for Embankment Dams (2011) Best Practices for Filter Design and Construction
- Pakistan Building Code (2021) Seismic

Standards (Material Testing Codes):

- Sieve Analysis D422
- Atterberg Limits D4318
- Moisture-Density (Proctor) D698
- Field Density (Compaction) D6938
- Permeability D2434/D5084
- Stone Specific Gravity & Absorption C127/C128
- Stone Abrasion C131

3.5 RAW MATERIAL SOURCE AND AVAILABILITY

Sources of different raw materials required for restoration of escape channels are given in the Table 3.2 below.

Table 3-2: Availability of construction material

Sr. No.	Raw Material	Availability in Surrounding Area	Criteria for Selection
1	Clay / Borrow Material (Embankment & Approach Filling)	Available at and near project site alluvial plains.	Material Quality: Fine-grained cohesive soil, suitable for compaction and embankment stability. Engineering Requirements: Low permeability, good shear strength. Logistics: Preference to on-site sources to minimize haulage. E&S Compliance: Avoid environmentally sensitive areas; approved by CSC.
2	Sand (Fine Aggregate)	Available from upland and riverine sources including Bareja (~45 km).	Clean, well-graded sand. Silt Content: < 5%. Fineness Modulus: 2.2–3.2. Free from organic impurities. Transport planning required due to lead distance.
3	Coarse Aggregates (Crushed Stone)	Sourced from Bareja and other upland quarries (~45–105 km) and riverbed deposits.	Strength: High crushing strength and durability. LAHV: ≤ 30–35%. Water Absorption: ≤ 2%. Suitable for RCC and structural works.
4	Stone for Pitching / Riprap / Apron Protection	Available in nullah beds near project area; additional sources from rock outcrops located 130–200 km away.	Size: 300–1000 mm depending on hydraulic design. Durability: Hard, abrasion-resistant. Absorption: ≤ 2–3%. Avoid laminated or weathered stones.
5	Geotextiles (Filter & Protection Layer)	To be procured from approved manufacturers/suppliers (not locally available as natural material).	High tensile strength, permeability, and durability. Resistant to UV degradation and chemical attack. Used for erosion protection and filtration beneath riprap.
6	Cement (Concrete Works)	Available from regional cement suppliers and markets.	Must comply with ASTM/BS standards. Proper strength, fineness, and setting time. Stored in dry conditions.
7	Reinforcement Steel (Rebar)	Available from approved steel mills and local distributors.	Conforming to ASTM A615 / A706. High yield strength, ductility. Free from rust and defects.
8	Water (Construction & Curing)	Arranged from local sources near project area.	pH: 6–8 TDS: < 2000 mg/L Free from harmful salts, oils, and organic matter. Suitable for concrete and compaction.
9	Sub-base / Base Course Material (Bridge Rehabilitation)	Available from riverbed and upland borrow sources identified by contractor.	CBR: ≥ 20–30% Well-graded, low plasticity. Suitable for road and bridge approach works.
10	Concrete (Structural & Lining Works)	Produced at site or via nearby batching facilities using above materials.	Mix design as per ACI/BS standards. Required strength (e.g., 3000–4000 psi). Durable under hydraulic conditions.

3.5.1 Borrow Area

The Borrow Area Map for Package-VI identifies multiple potential material sources located within and around the project area. These borrow areas provide essential construction materials, including clay, sand, aggregates, and stone for pitching and riprap, required for the development of the proposed schemes.

The identified Clay borrow source is located within or near the project influence area and comprise predominantly fine-grained cohesive soils. These materials are suitable for reconstruction of eroded embankments, restoration of damaged approaches to the super passage structure, backfilling around rehabilitated structural elements, and other earthworks associated with repair and strengthening activities. The close proximity of these sources to the project sites minimizes haulage distances and facilitates economical execution of rehabilitation works.

Sources of sand and aggregates are available from Bareja and Peer Chatta. The Bareja is situated about 25 km and Peer Chatta source is located approximately 100 km from the Escape Channel works. These sources provide suitable fine and coarse aggregates for structural concrete, reinforced concrete repairs, deck slab reconstruction, concrete lining rehabilitation, bedding layers, and other ancillary civil works required for restoration of the super passage structure and village road bridge. Due to the transportation distances involved, appropriate logistics planning will be required to ensure timely material supply.

Stone materials required for slope protection, erosion control, wing-wall protection works, riprap, pitching, and gabion installations are available from local nullah beds and designated quarry areas within the region. Additional rock sources are available from nearby hill ranges at moderate hauling distances. These materials possess adequate durability and strength for protecting rehabilitated structures and reconstructed embankments against future scour and erosion.

Overall, the identified borrow sources are considered adequate to meet the material requirements for the proposed rehabilitation and restoration works, including embankment repairs, structural concrete rehabilitation, bridge reconstruction works, lining repairs, and associated protection measures.

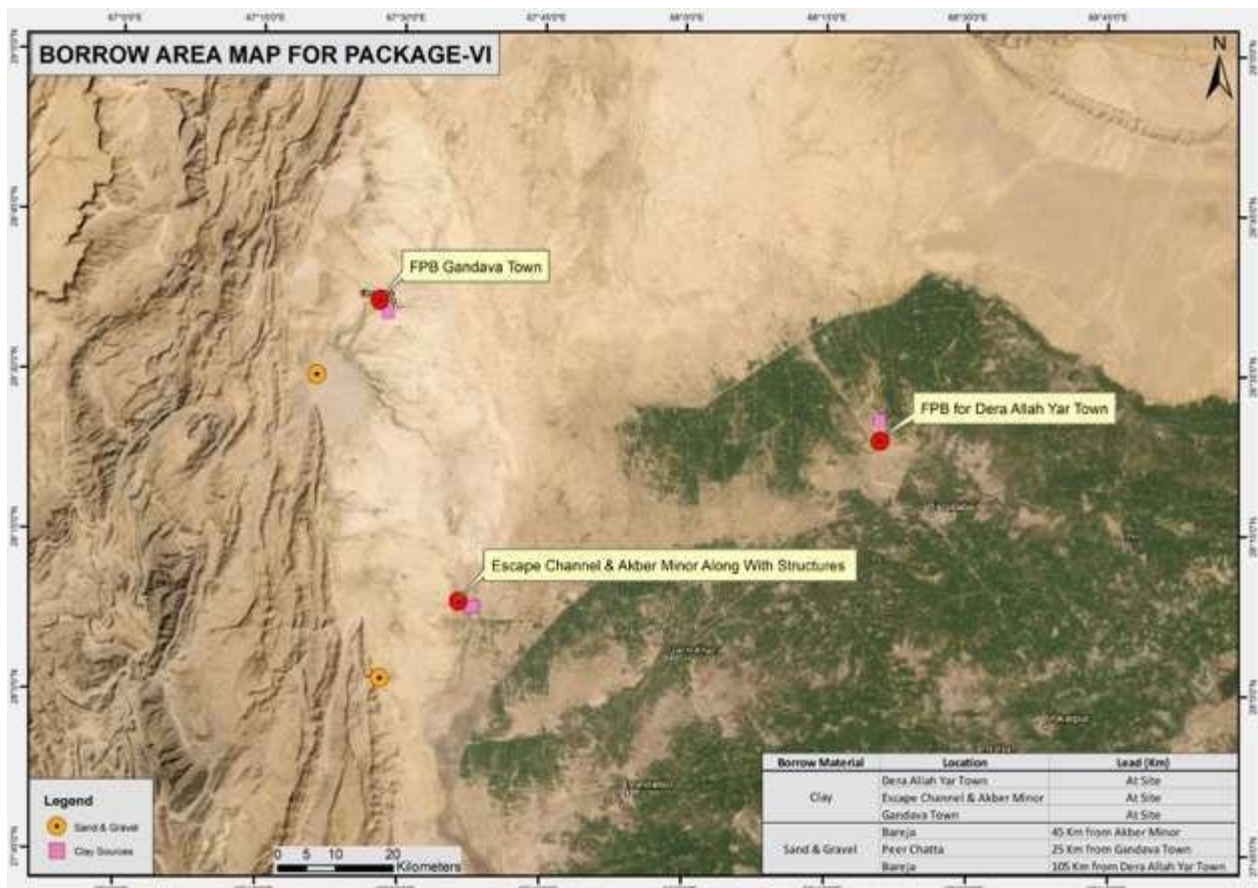


Figure-3-5: Borrow area map for Package-VI.

3.5.2 Contractor's Camp

The criteria for contractor's camp site will be 500 m 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 Akbar Minor and nearby villages. The machinery and equipment will be accommodated in the open yard or rented building in either Jhal Magsi or nearby area that should have enough storage and haulage space with ample moving and working space.

Approximately 20 labours will be required for construction of the proposed project of Restoration of Damages to Escape Channel & Akbar Minor. The priority will be given to local area inhabitants for skilled and unskilled labour jobs. The majority of labour needs (Skilled and Unskilled) will be met from the local area. It is anticipated that approximately 75% of the workforce will be from the sub- project area while some 25% of labour (skilled) would be hired from outside the sub-project area. This labour influx may have an impact on social norms, culture, and economy of the area. The proposed scheme of Restoration of Damages to Escape Channel & Akbar Minor will require only a single labor camp for its implementation.

3.5.3 Standards for the Construction of Workers Accommodation

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

Activity	Guidelines
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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)

3.6 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.

It should be a distance away from the population so it has least social and environmental impact on the population.

3.7 SECURITY ARRANGEMENTS AND HEALTHCARE FACILITIES

Given the prevailing security condition 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 subproject, 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 and in terms of health emergency a referral mechanism may be established so patients on in case of an health emergency labor can be referred timely to the District Head quarter Hospital. Almost all the unskilled labour will be employed from the local area. This will also keep the camps less pressurized and manageable.

3.7.1 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 3-3: Impact Characterization-Site Security

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

3.7.1.1 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:

3.7.1.2 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.

3.7.1.3 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.

3.7.1.4 Residual Impact

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

3.8 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

Sindh province on the south, and by Khuzdar district on the west. The climate of the district is extremely hot and dry in the summer. The summer season starts from April and lasts till October. June is the hottest month, with mean maximum and minimum temperatures of about 44 °C and 29 °C respectively. From November to the middle of March, the climatic conditions are pleasant. January is the coldest month and the mean maximum and minimum temperatures during this month are 23 °C and 8 °C. Rainfall is scanty and varies from place to place. Average annual rainfall in the district is 110 mm.

Table 4-1: Temperature (°C) of district Jhal Magsi

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Average Rainfall	18	30	38	27	17	20	55	47	18	5	5	15
Maximum Temperature	23	26	32	36	41	43	43	41	39	36	31	25
Minimum Temperature	5	5	9	12	19	22	22	23	22	13	10	6
Average temperature	14	16	21	27	32	34	35	33	31	26	22	17

Source: ERA 5 – Land data

Table 4-2: Rainfall (mm) and temperature (°C) of district Jhal Magsi.

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Average Rainfall	13.59	21.11	20.93	8.55	5.60	9.42	24.86	27.33	11.82	1.96	2.07	12.39
Maximum Temperature	14	16	21	27	31	33	35	33	31	26	21	17
Minimum Temperature	2	2	6	12	15	19	20	18	15	9	3	2
Average temperature	7	9	14	19	23	26	27	26	23	17	12	8

Source: ERA 5 – Land data

4.2.2 Land and Water Resources

District Jhal Magsi lies on a flat alluvial plain. The main land use statistics of the district as per Balochistan Development Statistics 2018-19 shows that total area is 361,500 HA, out of which 131,049 HA is total cultivated area. The district falls under the Tropical Agro-Ecological Zone and Western Dry Mountain Agro-Ecological Zone of Pakistan. The crops include wheat, barley, rapeseed & mustard, canola, sunflower, jowar, sesanum, moong, maash, moath, guar seed, cotton, tobacco, and sugarcane. Fruits include mangoes, citrus, guavas, dates, watermelon, ber, and mulberry. Onion, tomatoes, okra, tinda, spinach, cabbage, carrots, bitter gourd, bottle gourd, pumpkin, cauliflower, brinjal, and coriander are the vegetable produce of the district.

The major sources of irrigation in the district are canals. Various streams like Sukleji, Pir Chattal, and the Sharkal Nala ultimately join and form one stream, the waters of which are then used for irrigation purposes. In addition, Mir Saifullah Magsi Canal irrigates the lands of Kot Magsi. Moola Channel, Escape, Pat Magsi, Laibo, Miskan, Zareenabad, Baighari, Jodha, Dhori, Malwani, Karam Khan Khosa, Missri Khosa, Sippy, Ahmedabad, Beera, Gharr, Abad Distry, Abad Channel, Badra Nalla, and Sindur Distry Channel of Sikandar also provide irrigation waters.

4.2.3 Land Use and Soil Erosion

The Akbar Khan Minor command area lies in District Jhal Magsi, where agricultural activities are predominantly dependent on canal irrigation. The area exhibits moderate to high agricultural potential; however, the efficiency of cultivation is constrained by damage to irrigation and drainage infrastructure caused by recurrent flood events, leading to interruptions in water supply and reduced productivity of cultivable lands.

The Akbar Khan Minor and associated Escape Channel are located within an alluvial plain characterized by a mix of cultivated land, rural settlements, and patches of uncultivated or fallow

terrain. The surrounding landscape supports agriculture through controlled irrigation flows; however, due to inadequate drainage and structural damages, the area is frequently subjected to waterlogging and uncontrolled flood spread, affecting both farmland and local connectivity.

The soils in the project area predominantly consist of recent alluvial deposits, including sandy silt, silty clay, and fine sand derived from fluvial processes. These soils are generally fertile and suitable for agriculture, but their loose structure and variable cohesion make them highly susceptible to erosion under high-flow conditions. Flood events often result in bank erosion, scouring near hydraulic structures, and deposition of sediments within channels, leading to reduced conveyance capacity and degradation of agricultural land.

The proposed rehabilitation of the Escape Channel and Akbar Khan Minor structures will significantly improve land use conditions by restoring controlled water conveyance and reducing the impacts of flooding. Repair of super passages and the village road bridge will ensure proper hydraulic flow and prevent overflow into adjacent fields. Additionally, structural strengthening and protective measures will minimize scouring and erosion, thereby safeguarding agricultural land, improving irrigation efficiency, and enhancing the long-term stability of the area.

4.2.4 Climate Risks and Vulnerabilities in the Project Area

The project area of District Jhal Magsi is situated within the Kachhi Plain: one of the most climate-exposed alluvial floodplain settings in Balochistan: characterised by increasing frequency and intensity of extreme precipitation events that generate rapid-onset flash floods and substantially elevated surface runoff volumes concentrated within a short window of the monsoon season (July to August). These hydrometeorological hazards are compounded by the inherently limited flood conveyance capacity of existing hydraulic structures whose pre-2022 deteriorated condition, now evidenced by the comprehensive structural damage documented at Super Passage No. 5 (RD 4800), Super Passage No. 7 (RD 7300), and the Village Road Bridge at RD 3120 of Akbar Khan Minor, rendered the area acutely vulnerable to recurrent climate-induced inundation, backwater flooding, and approach failure, threatening Gandakha Baal, Bugti Goth, Panchpai Jadeed, and surrounding agricultural lands.

Projected changes in regional rainfall patterns under climate change scenarios indicate a heightened probability of high-intensity, short-duration storm events contributing to peak discharge levels that may approach or exceed the design capacity of hydraulic structures in the project influence area. The three sub-catchments draining toward the Escape Channel and Akbar Khan Minor structures: PO-1 (31.25 km², longest stream 15.91 m, slope 0.0002 m/m), PO-2 (3.7 km², stream 3.3 m, slope 0.0003 m/m), and PO-3 (31.87 km², stream 13.74 m, slope 0.0002 m/m): generate concentrated runoff that converges on the Escape Channel and Akbar Khan Minor alignment. The flat catchment slopes (0.0002–0.0003 m/m) produce low-velocity but high-volume flood spread across the alluvial plain before concentrating at structure throats, amplifying the hydraulic load on transitions, wing walls, aprons, and approach fills.

Recurrent extreme flood events accelerate the structural deterioration of hydraulic crossing structures through active degradation mechanisms including scour at foundation bases and apron toes, undermining of wing walls and abutments, erosion of approach embankments and transitions, siltation and debris accumulation within the structure throat reducing conveyance capacity, concrete spalling under repeated hydraulic impact, and progressive approach failure: as directly evidenced by the structural damage caused by the 2022 monsoon flood events that necessitated this sub-project. These mechanisms collectively reduce the hydraulic capacity of the super passages and the structural integrity of the village road bridge, increase the frequency and cost of corrective maintenance interventions, and shorten the operational lifespan of rehabilitated concrete and masonry assets.

The convergence of these physical climate risks: intensified storm events across a combined catchment of approximately **66.82 km²**, high-volume low-velocity flood spread concentrating at structure throats, and accelerated structural wear of RCC approach and protective works: underscores the imperative to apply climate-resilient design standards for structural concrete strength (3,000–4,000 psi), scour depth protection (3.20 m, silt factor 4.75), wing-wall and apron dimensioning, approach grading and drainage, and to institutionalise systematic post-flood inspection and maintenance protocols within the long-term management framework of the Escape Channel and Akbar Khan Minor structures.

4.2.5 Seismology

Seismic activity in Pakistan has been the source of destructive earthquake. These earthquakes have originated from sedimentary cover at shallow depth as well as from deep basement rocks. These earthquakes have been recorded and there are two kinds of records; historic or pre-instrumented data consisting of felt intensity based on recorded damage and instrumented data collected by various national and international seismic networks. Based on earthquake data and geological faults, the Building Code of Pakistan (BCP) has prepared a map showing seismic zones of Pakistan.

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 0.24 to 0.33g for scheme no. 01 and 0.20 to 0.24g for both scheme no. 02 and 03.

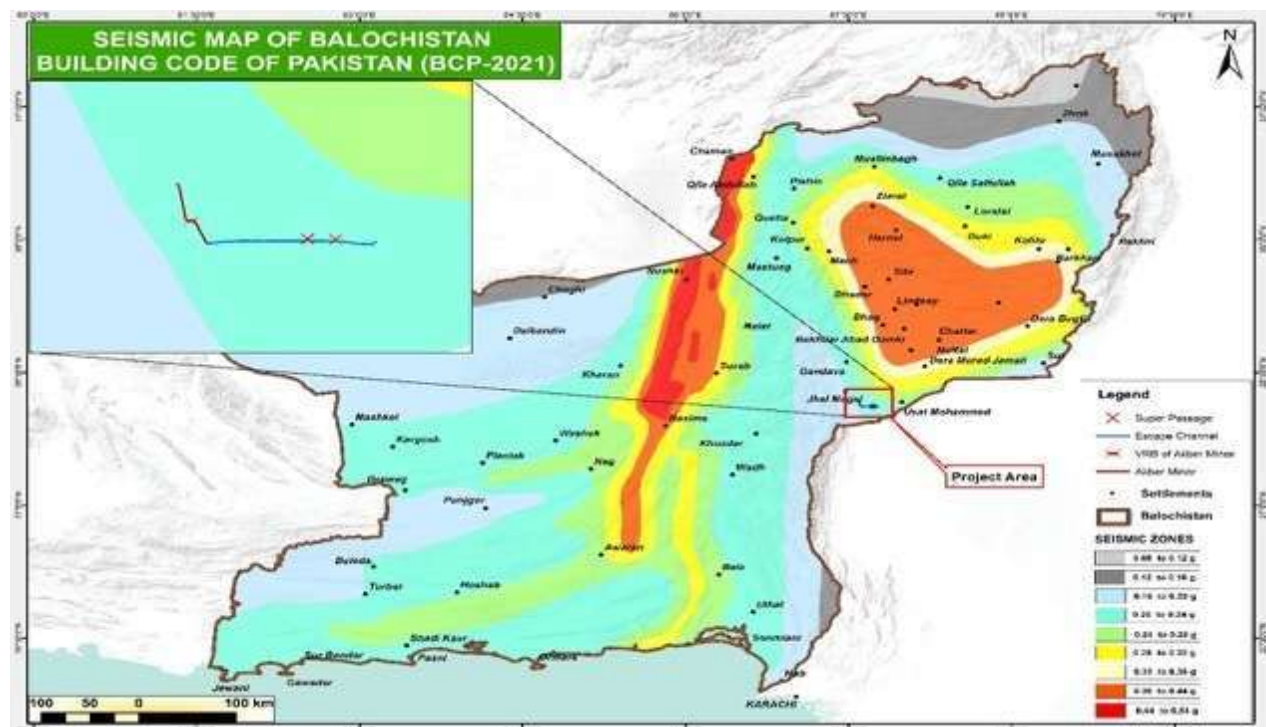


Figure-4-2: Seismic map of Balochistan showing the location of the sub-project area.

4.2.6 Hydrology

The hydrological studies are intended to estimate the different hydrological parameters of sub-projects. These studies form the basis for estimation of water availability and the hydraulic design of works proposed under the Project. The watershed characteristics of the proposed structures are as follows.

Table 4-3: Characteristics of catchment area

Scheme Name	Catchment Area Km ²	Length of Longest Stream (m)	Slope (m/m)
Restoration of damages to Escape Channel & Akbar Minor			
PO-1	31.25	15.91	0.0002
PO-2	3.7	3.3	0.0003
PO-3	31.87	13.74	0.0002

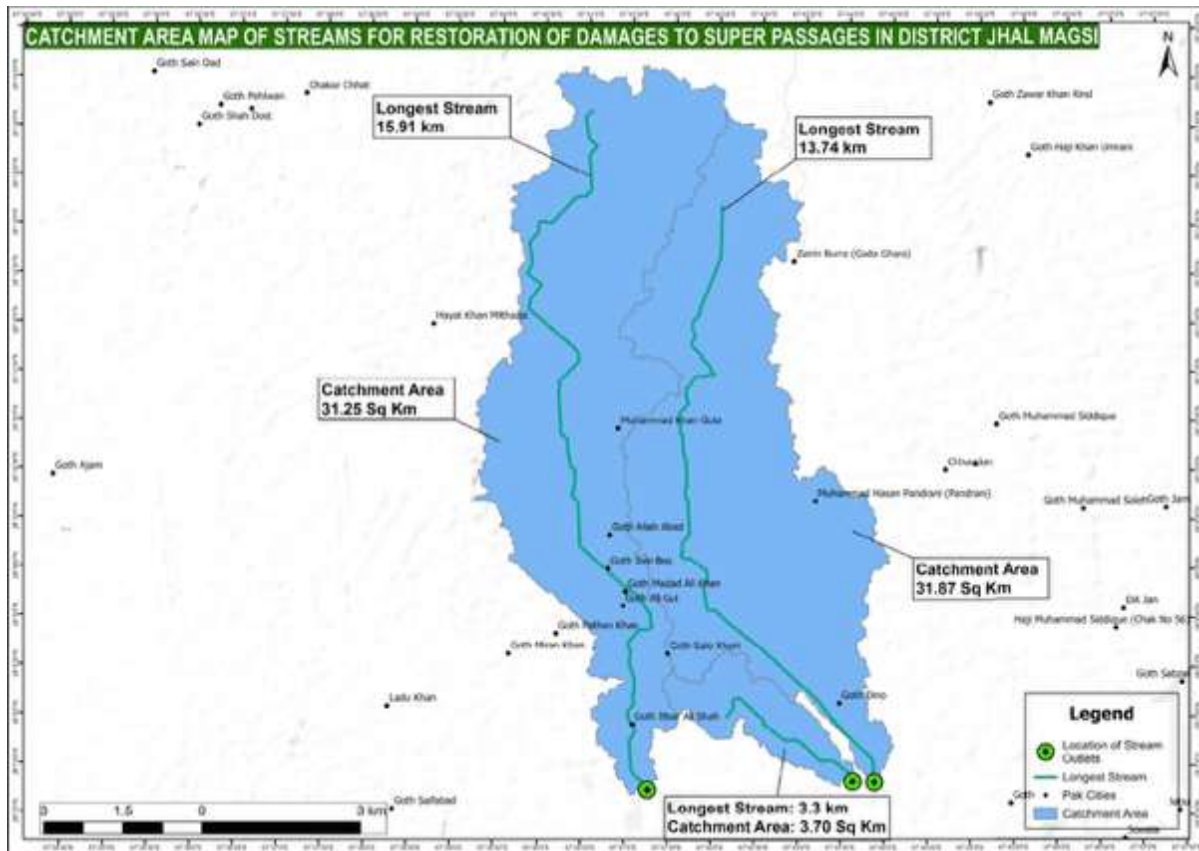


Figure-4-3: Location and catchment area map of Escape Channel and Akbar Minor

4.2.7 Ambient Air Quality

The ambient air quality pollutant testing was carried at the location of Akbar minor and escape channels. Overall air quality is fair. The pollutants monitored are particulate matter (PM₁₀), nitrogen oxides (NO), fine particles, Sulphur dioxide (SO₂), carbon monoxide (CO), coarse particles, 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/m ³)	NO ₂ (µg/m ³)	SO ₂ (µg/m ³)	CO (mg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	SPM (µg/m ³)	O ₃ (mg/m ³)
NEQS & BEQS Limit	-	24 hrs (40 µg/m ³)	24 hrs (80 µg/m ³)	24 hrs (120 µg/m ³)	08 hrs (40 µg/m ³)	24 hrs (5 mg/m ³)	24 hrs (150 µg/m ³)	24 hrs (500 µg/m ³)	01 hrs (130 µg/m ³)
WHO Limit	-	-	24 hrs (25 µg/m ³)	24 hrs (40 µg/m ³)	08 hrs (08 µg/m ³)	24 hrs (15 mg/m ³)	24 hrs (45 µg/m ³)	-	Peak season (60 µg/m ³)

Parameters	Temp.	NO ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	CO (mg/m^3)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	PM ₁₀ ($\mu\text{g}/\text{m}^3$)	SPM ($\mu\text{g}/\text{m}^3$)	O ₃ (mg/m^3)
Time	Results								
10:00 AM	33	19.8	39.2	7.8	-	-	-	-	-
11:00 AM	33	13.2	30.5	7.2	0.0451	31.2	83.3	114.5	5
12:00 PM	35	18.9	38.1	9.3	0.048	25.5	81.5	107	-
01:00 PM	35	21.1	41.5	8.5	0.048	27.4	98.6	126	-
02:00 PM	35	14.6	37.8	9.1	0.048	28.9	91.4	120.3	-
03:00 PM	35	20.2	40.2	4.5	0.048	24.1	94.7	118.8	-
04:00 PM	36	15.3	43.5	8.7	0.062	26.3	95.5	122	-
05:00 PM	36	19.9	36	9	0.062	21.2	105	126.2	-
06:00 PM	34	11.5	40.9	8.3	0.042	24.4	101.2	125.6	-
07:00 PM	34	16.3	32.4	3.8	0.044	28.2	97.5	125.7	-
08:00 PM	33	11.1	33.2	8.1	0.044	23.2	92.3	115.5	-
09:00 PM	31	12.4	28.5	7.9	0.029	30	97.4	127.4	-
10:00 PM	30	14.3	34	3.1	0.039	21.5	86.2	107.7	-
11:00 PM	29	7.4	26.3	5.9	0.039	30.8	88	118.8	-
12:00 PM	29	11.2	26.7	6	0.028	26.1	79.6	105.7	-
01:00 AM	29	8.7	22.4	1.9	0.028	28	82	110	-
02:00 AM	28	6.3	21.1	1.2	0.028	21	74.5	95.5	-
03:00 AM	27	9.2	28.9	4.8	0.029	19.5	71.1	90.6	-
04:00 AM	28	8.4	19.9	0.9	0.028	28.4	69.5	97.9	-
05:00 AM	26	5.6	26.1	5.2	0.029	29.3	66	95.3	-
06:00 AM	27	9.7	21.3	0.7	0.029	22.5	58.3	80.8	-
07:00 AM	28	7.5	20	3.7	0.037	31.5	63.5	95	-
08:00 AM	29	14.8	27	5.8	0.037	25.2	56.4	81.6	-
09:00 AM	31	11.9	28.8	2.4	0.047	30.1	65.1	95.2	-
AVERAGE	30.7	12.99	31.99	5.91	0.0435	26.81	79.76	108.65	5

Table 4-5: Ambient Air Quality Analysis

Sr	Measuring Parameters	Unit	WHO Limit	NEQS & BEQS Limits	Average Test Result	Remarks
1	Measuring Parameters	Unit	WHO Limit	NEQS & BEQS Limits	Average Test Result	Remarks
2	Oxide Of Nitrogen as (NO)	$\mu\text{g}/\text{m}^3$	-	40 (24 hrs.)	12.99	WL
3	Oxide Of Nitrogen as (NO ₂)	$\mu\text{g}/\text{m}^3$	25 (24 hrs.)	80 (24 hrs.)	31.99	WL
4	Sulphur Dioxide (SO ₂)	$\mu\text{g}/\text{m}^3$	40 (24 hrs.)	120 (24 hrs.)	5.91	WL
5	Carbon Monoxide (CO)	mg/m^3	4 (24 hrs.)	5 (08 hrs.)	0.0435	WL
6	Particulate Matter (PM 2.5)	$\mu\text{g}/\text{m}^3$	15 (24 hrs.)	35 (24 hrs.)	26.81	WL
7	Particulate Matter (PM 10)	$\mu\text{g}/\text{m}^3$	45 (24 hrs.)	150 (24 hrs.)	79.76	WL
8	SPM	$\mu\text{g}/\text{m}^3$	-	500 (24 hrs.)	108.65	WL

4.2.8 Water Quality

Environmental sampling for surface and ground water was carried out along the Subproject locations. The samples were analyzed by following the standard protocols. However, certain results are found above the permissible limits of NEQs for ground water. A summary of laboratory and analytical test results are tabulated in Table 4.5, 4.6 and 4.7 above.

a) Surface Water Quality

Table 4-6: Surface water quality at Akbar Minor and Escape Channels

Sr	Parameters	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Results	Remarks
1	Turbidity	NTU	HACH Turbidity meter	<5	<15	<15	<0.09	OL
2	Taste	Taste	Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-obj	OL
3	Odour	Odor	Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-obj	WL
4	Colour	TCU	Pt-Co method	≤15 TCU	≤15 TCU	≤15 TCU	<4	WL
5	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	-	-	-	ND	WL
6	Residual chlorine	Cl ₂ (mg/L)	HACH Method 8167	0.2-0.5	-	0.2-0.5	0.9	WL
7	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
8	Total Dissolved Solid	TDS (mg/L)	APHA 2340-C	<1000	<1000	<1000	-	OL
9	Total Hardness	AS	APHA 2340-C	<500	-	<500	392	WL
10	Fluoride	F ⁻¹ (mg/L)	APHA 4500-F ⁻¹	≤1.5	1.5	≤1.5	-	OL
11	Chloride	Cl ⁻¹ (mg/L)	APHA 4500-Cl ⁻¹	<250	250	<250	-	OL
12	Cyanide	CN ⁻¹ (mg/L)	HACH Method 8027	≤0.05	0.07	≤0.05	ND	WL
13	Nitrate	NO ₂ ⁻ (mg/L)	HACH Method 8192	≤50	50	≤50	0.31	WL
14	Nitrite	NO ₂ ⁻ (mg/L)	APHA 4500-NO ₂ ⁻ B	≤3.0(P)	3	≤3.0(P)	0.05	WL
15	Antimony	Sb (mg/L)	ASTM D-3697	≤0.005	0.02	≤0.005	ND	WL
16	Aluminum	Al(mg/L)	ASTM D-857	≤0.2	0.2	≤0.2	0.11	WL
17	Arsenic	As (mg/L)	ASTM D-2972	≤0.05	0.01	≤0.05	ND	WL
18	Boron	B (mg/L)	ASTM D-3082	0.3	0.3	0.3	ND	WL
19	Bartum	Ba(mg/L)	ASTM D-4382	0.7	0.7	0.7	0.008	WL
20	Chromium Total	Cr(mg/L)	ASTM D-1687	≤0.05	0.05	≤0.05	ND	WL
21	Copper	Cu (mg/L)	ASTM D-1688	2	2	2	<0.08	WL
22	Cadmium	Cd(mg/L)	ASTM D-3557	0.01	0.003	0.01	ND	WL
23	Lead	Pb(mg/L)	ASTM D-3559	≤0.05	0.01	≤0.05	ND	WL
24	Manganese	Mn(mg/L)	ASTM D-858	≤0.5	0.5	≤0.5	ND	WL
25	Mercury	Hg (mg/L)	ASTM D-3223	≤0.001	0.001	≤0.001	ND	WL
26	Nickel	Ni(mg/L)	ASTM D-3866	≤0.02	0.02	≤0.05	ND	WL
27	Selenium	Se(mg/L)	ASTM D-3858	0.01	0.01	0.01	ND	WL
28	Zinc	Zn (mg/L)	ASTM D-1691	5	3	5	0.15	WL

*WL (Within Limits)

b) Ground Water Quality

Table 4-7: Ground water quality at Akbar Minor and Escape Channels

Sr	Measuring Parameter	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Results
1	Temperature AT 40 °C	°C	By Calibrated Thermometer	40 + ±03°	40 + ±03°	40 + ±03°	32.1
2	pH @ 25 °C	pH	ASTM D-1293	6 to 9	6 to 9	6 to 9	7.14

Sr	Measuring Parameter	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Results
3	Biological Oxygen Demand	BOD ₅ (mg/L)	APHA 5210	80	80	80	-
4	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	150	150	-
5	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500	3500	3500	-
6	Total Suspended Solids	TSS (mg/L)	APHA 2540-D	200	200	200	-
7	Oil & Grease	O ₂ 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 ¹	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 ²	1	1	1	0.3
14	Ammonia	NH ₃ (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 ⁺ (mg/L)	APHA 3500-Cr	1	1	1	ND
17	Chromium Hexavalent	Cr ⁺ (mg/L)	APHA 3500-Cr	1	1	1	0.038
18	Lead	Pb ₂ (mg/L)	ASTM-D3559	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	1	1	ND
21	Silver	Ag (mg/L)	ASTM-D3866	1	1	1	ND
22	Zinc	Zn ₂ (mg/L)	HACH Zincon Method	5	5	5	0.7
23	Total Iron	Fe ₂ (mg/L)	APHA 3500-Fe	8	8	8	0.6
24	Manganese	Mn ₂ (mg/L)	APHA 3500-Mn	1.5	1.5	1.5	0.05
25	Boron	Br(mg/L)	APHA 4500-Mn	6	6	6	0.9
26	Sulfate	SO ₃ (mg/L)	APHA 4500-SO ⁴	600	600	600	219
27	Arsenic	As (mg/L)	Palmtest Kit	1	1	1	ND
28	Copper	Cu ² (mg/L)	HACH Biquinoline Method	1	1	1	0.04
29	Chlorine	Cl ₂ (mg/L)	HACH DPD Method	1	1	1	ND
30	Aluminum	Al (mg/L)	HACH Eriochrome Cyanine R	1	1	1	ND
31	Total Kjeldahl Nitrogen	(mg/L)	Kit Method	2	2	2	0.32
32	Barium	Ba (mg/L)	ASTM D-4382	1.5	1.5	1.5	0.21

c) Noise Record

Table 4-8: Noise Record at Akbar Minor and Escape Channels

Measuring Parameter	Testing Instrument	Noise Test Report WHO Limit	NEQS & BEQS Limits	TIME	Results
				10:00A M	38.71

Measuring Parameter	Testing Instrument	Noise Test Report WHO Limit	NEQS & BEQS Limits	TIME	Result s
Noise Level	Noise Meter	65 dB(A) (Day time)	75 dB(A) (Day time)	11:00A M	37.18
				12:00P M	38.37
				01:00P M	40
				02:00P M	36.17
				03:00P M	38.03
				04:00P M	35.54
				05:00P M	39.38
				06:00P M	37.1
				07:00P M	38.07
				08:00P M	36.59
				09:00P M	34.56
				10:00P M	37.39
		55 dB(A) (Night time)	65 dB(A) (Night time)	11:00P M	32.62
				12:00A M	30.42
				01:00A M	33
				02:00A M	34.14
				03:00A M	32.32
				04:00A M	34.9
				05:00A M	30
				06:00A M	33.93
		65 dB(A) (Day time)	75 dB(A) (Day time)	07:00A M	32.32
				08:00A M	35.28
				09:00A M	36.3
Average Result					35.5

4.3 ECOLOGICAL ENVIRONMENT

4.3.1 Environment and Biodiversity

Major tree species found in District Jhal Magsi include Kandi (*Prosopis cineraria*), Lao (*Tamarix spp.*), and Pelo (*Salvadora oleoides*), while planted species such as Shisham (*Dalbergia sissoo*), Keekar (*Acacia arabica*), and Eucalyptus are commonly grown in irrigated and settled areas. Fruit trees cultivated in the district include dates, mango, guava, citrus, and ber (*Zizyphus jujuba*). Along canal banks and seasonal streams, riparian vegetation comprising *Mentha longifolia* and *Rumex obtusifolius* is also found.

The main shrubs and bushes include Karir (*Capparis aphylla*), Desert Teak (*Tecoma undulata*), and Milk Broom, whereas ground cover is dominated by agricultural crops such as wheat, sorghum (jowar), barley, mustard, and rice.

Vegetation zones of the district consist mainly of the following categories:

- **Flood plains and cultivated areas:** These areas are intensively utilized for agriculture and are characterized by Kandi (*Prosopis cineraria*), Keekar (*Acacia arabica*), Shisham (*Dalbergia sissoo*), Eucalyptus plantations, and fruit orchards comprising dates, mango, guava, citrus, and ber. Major field crops include wheat, sorghum, barley, mustard, and rice.
- **Foothills and dry plains:** These areas support sparse natural vegetation dominated by shrubs such as Karir (*Capparis aphylla*), Desert Teak (*Tecoma undulata*), and Milk Broom, associated with grasses and herbaceous species adapted to arid conditions.
- **Dry stream beds and canal banks:** *Tamarix* spp. (Lao) and riparian species such as *Mentha longifolia* and *Rumex obtusifolius* are commonly found along seasonal streams, drains, and irrigation channels.

Common mammals found in the district include Asiatic Jackal, Desert Fox, Jungle Cat, Chinkara Gazelle, Cape Hare, Indian Crested Porcupine, while Sindh Ibex and Urial are occasionally found in the western mountainous fringes. Livestock species include Bhagnari cattle, sheep, goats, and camels.

Avifauna of the district includes Grey Partridge, Black Partridge, Chakor, See-see Partridge, Houbara Bustard, Peregrine Falcon, and Egyptian Vulture. Reptiles include Saw-scaled Viper, Indian Cobra, Desert Monitor Lizard, and Agamas. Invertebrate fauna comprises scorpions, beetles, and desert locusts.

Table 4-9: Ecological Environment of District Jhal Magsi

Category	Component	Key Species / Examples
Tree Species	Natural/Desert	Kandi (<i>Prosopis cineraria</i>), Lao (<i>Tamarix spp.</i>), Pelo (<i>Salvadora oleoides</i>)
	Cultivated	Shisham (<i>Dalbergia sissoo</i>), Keekar (<i>Acacia arabica</i>), Eucalyptus
	Fruit/Orchards	Dates, Mango, Guava, Citrus, Ber (<i>Zizyphus jujuba</i>)
	Shrubs & Herbs	Karir (<i>Capparis aphylla</i>), Desert Teak (<i>Tecoma undulata</i>), Milk Broom
	Aquatic/Riparian	<i>Mentha longifolia</i> , <i>Rumex obtusifolius</i> (found near canals and streams)
Flora	Major Crops	Wheat, Sorghum (Jowar), Barley, Mustard, Rice
	Game Birds	Grey Partridge, Black Partridge, Chakor, See-see Partridge
	Migratory/Rare	Houbara Bustard, Peregrine Falcon, Egyptian Vulture
Mammals	Wild Carnivores	Asiatic Jackal, Desert Fox, Jungle Cat
	Wild Herbivores	Chinkara Gazelle, Cape Hare, Indian Crested Porcupine
	Mountain Species	Sindh Ibex, Urial (western mountainous fringes)
	Livestock	Cattle (Bhagnari breed), Sheep, Goats, Camels
Others	Reptiles	Saw-scaled Viper, Indian Cobra, Desert Monitor Lizard, Agamas
	Invertebrates	Scorpions, various Beetles, and Desert Locusts

4.3.2 Protected Areas and Endangered Wildlife

The district hosts specific conservation sites managed by the Balochistan Forest and Wildlife Department:

- **Ghondak Dhono Wildlife Sanctuary:** A notified sanctuary located within Jhal Magsi district dedicated to the protection of native terrestrial fauna.
- **Kirthar Range Extension:** While the core Kirthar National Park is in Sindh, the mountainous western 20% of Jhal Magsi comprises the northern stretches of the **Kirthar Range**, which acts as a de facto protected corridor for mountain wildlife.
- **Peer Chattal Shah Noorani Oasis:** A culturally protected site near Kotra where the local community enforces a strict religious ban on fishing or harming the "sacred" fish in the natural springs.

4.3.3 Endangered & Vulnerable Wildlife

The following species found in or passing through Jhal Magsi are classified as endangered or vulnerable according to national and IUCN standards:

Table 4-10: Endangered & Vulnerable Wildlife

Species	Conservation Status	Notes
Houbara Bustard	Vulnerable	A migratory bird that winters in Jhal Magsi's desert plains; highly threatened by illegal hunting.
Sindh Ibex	Vulnerable	Inhabits the western mountainous ranges (Kirthar extension) of the district.
Pangolin	Endangered	Rare but present in the scrub forests; threatened by illegal trade and habitat loss.
Chinkara Gazelle	Vulnerable	Found in the open plains and desert areas of the district.
Egyptian Vulture	Endangered	A bird of prey occasionally sighted in the arid highlands.
Urrial	Vulnerable	Specifically, the Afghan/Balochistan Urrial found in the hilly terrains.

4.3.4 Trees and Vegetations Status

As per the initial baseline survey, the assessment of trees and vegetation for the Akbar Minor project indicates that no trees are anticipated to be felled during implementation. The project alignment has been carefully reviewed, and there are no trees located within the right-of-way (ROW).

4.4 SOCIO-ECONOMIC BASELINE

4.4.1 General

As part of the Environmental and Social Management Plan (ESMP) preparation, a comprehensive socio-economic baseline study was conducted for the Akbar Minor area, covering six villages: Rasool Abad, Panchpai Jadeed, Bugti Goth, Nushki Jadeed, Ahmad Abad, and Gandakha Baal. The assessment examined demographic characteristics, livelihood patterns, access to basic services, and the condition of local infrastructure.

An updated field survey carried out in August 2025 further assessed the prevailing socio-economic conditions and reviewed the continuing impacts of the catastrophic 2022 floods on the affected communities.

4.4.2 Data Source and Methodology of Baseline Survey

The socio-economic baseline survey for the Akbar Minor 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.

During the baseline survey in different villages of Akbar Minor, a total of 59 households were identified, with an overall population of about 1800 but the total population of the areas is 20900. From this population, 59 households were selected for detailed assessment, and interviewed – 20 men, 19 women and 20 others. The sample represents approximately 1.98% of male and female household members and vulnerable groups, ensuring that the perspectives of men and women were proportionately included. This approach provided valuable insights into the community's demographic structure and helped capture the social realities of the area in a balanced manner.

4.4.3 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 project area were chosen to reflect the wider community. Then, 59 households were proportionally selected across poor, middle, and better-off groups, ensuring fair representation and reliable results.

4.4.4 Sampling Strategy and Tools

The sampling process for the Akbar Minor subproject was carried out in two distinct phases using structured survey instruments. In the initial phase, the relevant Union Councils covering the Akbar Minor command area were selected through a random sampling method to ensure unbiased and representative geographic coverage. In the subsequent phase, households were identified through proportional sampling, ensuring balanced representation of different socio-economic groups, including poor, vulnerable, middle-income, and relatively better-off households, in accordance with their distribution within the project area.

In compliance with the requirements of the World Bank Environmental and Social Framework (ESF), particularly for stakeholder engagement, baseline assessment, and impact identification, the following tools and instruments were utilized:

- Structured Household Socio-Economic Survey Questionnaire (for quantitative baseline data collection)
- Key Informant Interview (KII) Checklists (for consultations with local leaders, community representatives, and relevant government officials)
- Focus Group Discussion (FGD) Guides (separate sessions conducted with men, women, and vulnerable groups to ensure inclusive participation)
- Stakeholder Mapping and Analysis Matrix
- Vulnerability Assessment and Screening Format
- Observation Checklist (for ground verification of settlement patterns and infrastructure conditions)
- Secondary Data Review, including data from the Pakistan Bureau of Statistics, district administration records, and local Union Council records

The survey instruments covered the following key thematic areas:

- Agriculture and Natural Resources
- Primary Sources of Income and Livelihood

- Housing and Living Conditions
- Sanitation Facilities
- Health and Nutrition
- Education

4.4.5 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.

4.4.6 Short Profile of District Jhal Magsi

Total population of district Jhal Magsi is 149,225 (Census PBS, 2017) as compared to 109,941 in 1998; 51.5% is male population and 48.5% is female population in 2017. Male- female sex ratio is 106.57 and population growth rate is 1.74% per year. Urban population of the district is 7,825 (5.2%) and rural population is 141,400 (94.8%). District household size is 5.96, urban household size is 6.23 and rural household size is 5.94.

Table 4-11 Demography and Population Patterns

Population (2023)	203,368 persons
Urban Population	24,130
Rural Population	179,238
Area	3,615 Square KM
Population Density	56.26 persons/KM
Growth Rate	1.7%
Male Population	51.5%
Female Population	48.5%
	In Jhal Magsi, the majority of people speak Balochi (around 60%). Brahvi (about 15%) while Sindhi (10%) and Siraiki (5%) are present. Urdu (10%) is widely understood and used in schools, government offices, and formal communication.
Tehsils/Talukas	02 Tehsils and 01 sub-Tehsil, Jhal Magsi Tehsil, Gandawah Tehsil, Mirpur sub-Tehsil
Municipal Committee	MC, Gandawah. MC, Jhal Magsi
Union Councils	Gandawah, Khari, Patri, Jhal Magsi, Hathiari, Panjuk, Kot Magsi, Barija, Mat Sindhur, Safrani, Saifabad, Akbarabad, and Mir Pur.
Main Towns	Jhal Magsi, Gandawah, Mirpur, Kot Magsi, Abad, Khanpur Bhaltoor, Kotra, Altaz Khan, and Bhootani
Literacy Rate	25%
Male Literacy Rate	38%
Female Literacy Rate	11%
Main Crops	Wheat, barley, rapeseed & mustard, canola, sunflower, jowar, sesanum, moong, maash, moath, guar seed, cotton, tobacco, and sugarcane
Major Fruits	Mangoes, citrus, guavas, dates, watermelon, ber, and mulberry
Major Vegetables	Onion, tomatoes, okra, tinda, spinach, cabbage, carrots, bitter gourd, bottle gourd, pumpkin, cauliflower, brinjal, and coriander
Forest (Area)	32,518 HA
Total Black Topped Roads	1,034.0 km
Single Roads	99.0 km

Electricity	Quetta Electric Supply Company (QESCO) looks after supply and transmission of electricity
No. of Tel. Exchanges	02 Telephone Exchanges providing 767 landlines, 467 wireless phones, and 235 broadband connections.

4.4.7 Sensitive Receptors

The settlements surrounding the subproject area are identified as sensitive receptors, located at distances ranging from a minimum of approximately 0.5 km (Ghandakha Baal) to a maximum of 8.0 km (Nushki Jadeed). These include Rasool Abad, Nushki Jadeed, Ahmad Abad, Panchpai Jadeed, Bugti Goth, and Ghandakha Baal, collectively comprising 2,971 households with an estimated population of 20,900. Due to their proximity particularly for villages located within 1 km minor indirect impacts such as dust, noise, and increased traffic movement may occur during construction activities. Therefore, appropriate mitigation measures, including dust suppression, traffic management, and controlled working hours, will be implemented to minimize potential disturbances and ensure the safety and well-being of the local communities.

Table 4-12 Distance from the Subproject Area

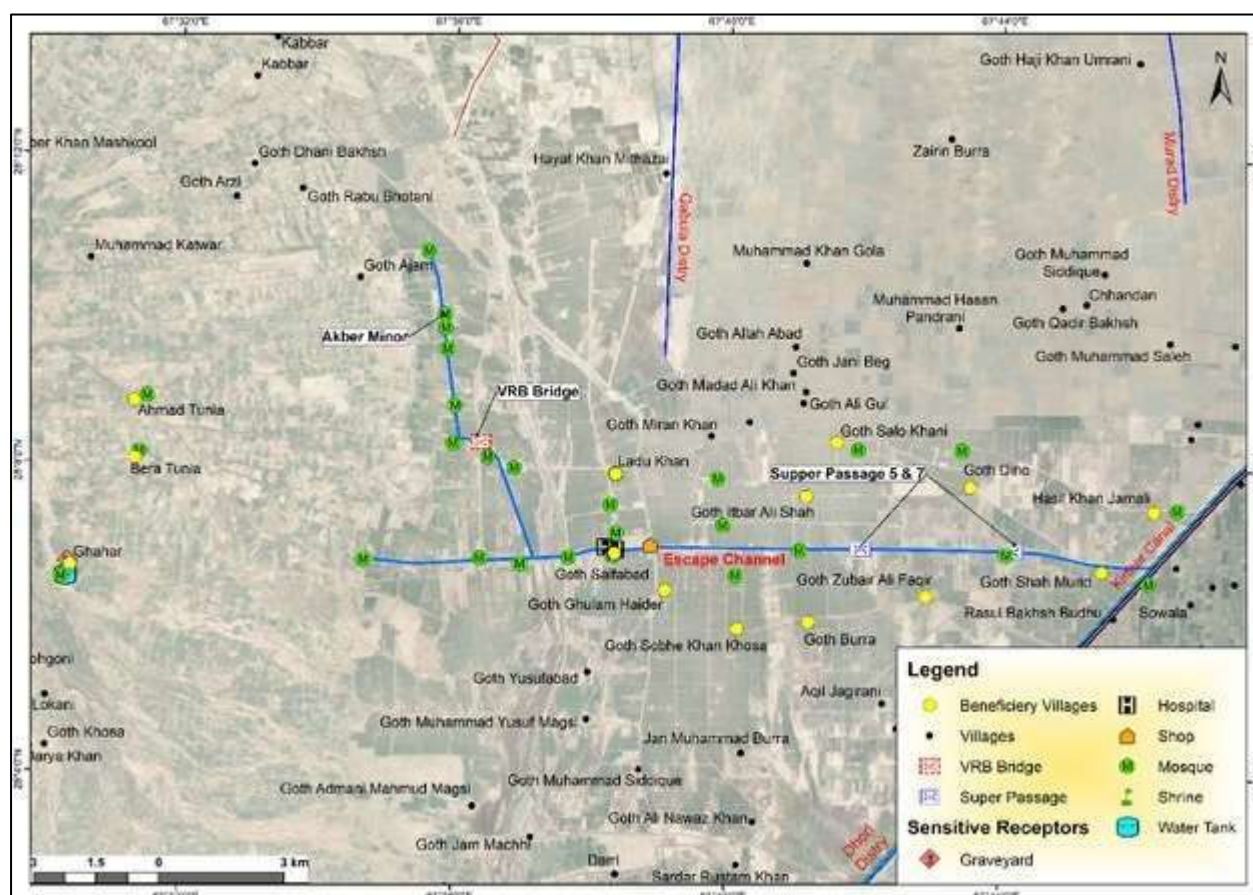


Figure-4-4: Map showing Sensitive receptors near the sub-project area

Due to their proximity, these communities may experience temporary construction-related impacts such as dust emissions, noise, increased movement of construction machinery, and short-term access restrictions during the execution phase. However, these impacts are expected to be localized, short-term, and manageable through the implementation of appropriate mitigation measures. Vegetation within the project influence area is generally sparse, with scattered trees and agricultural plantations observed; however, most of these are located outside the immediate Right of Way (RoW) of the proposed works. Therefore, no significant direct impacts on vegetation are anticipated during project implementation.

Table 4-13 Benefitted villages of the sub-project area.

Village Name	Distance from the Subproject Area
Rasool Abad	6 km
Nushki Jadeed	8 km
Ahmad Abad	4 km
Panchpai Jadeed	3 km
Bugti Ghot	1 km
Gandakha Baal	0.5 km

4.4.8 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 Akbar Minor subproject. 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.

4.4.8.1 Household Survey

During the baseline survey in the Akbar Minor command area, a total of 2,971 households were identified, with an overall population of about 20,900 people. Out of these, 59 households were selected for detailed assessment, and 59 individuals were interviewed 20 men and 19 women. The sample was carefully designed to represent 50% of both male and female household members, ensuring that perspectives from both genders were included. This approach provided a balanced understanding of community conditions and helped capture the social dynamics of the area in a way that reflects the voices of men and women alike.

Table 4-14 Household Survey of the Proposed Project Area

Household Survey	Details
Total households in Akbar Minor area	2,971
Total population	20,900
Households surveyed	59
Individuals interviewed	59 (20 men, 19 women & 20 others)
Sample represents	1.98% of male and female household members

4.4.8.2 Education Facilities

Education facilities in the project area are limited and unevenly distributed. Killi Rasool Abad has only one primary school, while Ahmad Abad has one combined primary and middle school, which serves students from surrounding settlements as well. Villages such as Nushki Jadeed, Panchpai Jadeed, Bugti Ghot, and Gandakha Baal have no formal education facilities, resulting in restricted access to schooling, particularly for young children. The majority of households in

these villages depend on farming as their primary livelihood, and widespread poverty further constrains educational opportunities. Many landowners reside in the area only seasonally, typically for about three months during the winter, which affects community stability and long-term investment in education infrastructure. Overall, weak school infrastructure, limited availability of teachers, and socio-economic constraints remain key challenges affecting education in the project area.

4.4.8.3 Health Facilities

Health care services in the project area are very limited. Among the surveyed villages, only Ahmad Abad has a small private dispensary with basic and limited facilities, while Rasool Abad, Nushki Jadeed, Panchpai Jadeed, Bugti Ghot, and Gandakha Baal lack any formal health facilities. Most residents depend on distant health centers for medical care, which is difficult due to poor connectivity and low incomes. Poverty is widespread, and the majority of the population consists of nomadic farmers and seasonal landowners who reside in the area mainly during the winter for about three months. These conditions, combined with lack of public health services, significantly limit access to timely and adequate healthcare in the project area.

For emergencies, specialized treatment, or advanced medical care, residents must travel to the District Headquarters Hospital in Jhal Magsi, or, in critical cases, to Karachi.

4.4.8.4 Water Supply and Sanitation

The baseline survey indicated that access to safe water in the project area is limited. Only one functional water supply scheme exists in Killi Rasool Abad, while the rest of the villages rely on unprotected wells, hand pumps, or seasonal water sources. Sanitation facilities are also minimal, with most households lacking improved toilets, which increases the risk of waterborne diseases.

4.4.8.5 Communication and Electricity

Landline telephone services are unavailable, and mobile network coverage is weak, with residents relying on signals from Jhal Magsi Tehsil, located approximately 3 km away. All households are connected to the national electricity grid (K-Electric); however, frequent load shedding limits power availability to roughly 6 hours per day. There is no natural gas supply in the area. Residents rely on LPG, gasoline, bushes, and firewood for cooking and heating needs.

4.4.8.6 Transport

The area is located 3 km from Jhal Magsi and 343 km from Quetta City. Common transport modes include minibuses, rickshaws, pickups, and motorbikes. Link roads in the four villages are Semi pakha tracks, poorly maintained, and require urgent rehabilitation.

4.4.8.7 Social Conflicts

No tribal conflicts were reported in the sub-project area. Conflict resolution traditionally occurs through tribal or community led mechanisms, which residents often consider more effective than formal government channels. Community members confirmed that no conflicts past or present are associated with the project area.

4.4.8.8 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 Akbar Minor command area, covering 06 villages with a total population of 20,900. The details are presented in the table below:

Table 4-15: Number of households and total population

Name of Villages	Number of Households in Village	Total Population
Akbar Minor 06 Villages	2,971	20,900
Total Household and Population	2,971	20,900

4.4.8.9 Respondent's Relationship with Head of Household

During the survey, 75% of the respondents were heads of households who participated directly in the interviews. Additionally, 10% of respondents were brothers, 05% were sons, and 05% were wives of the household heads. Female-headed households accounted for 05% of the total respondents.

4.4.8.10 Family Size

The survey data indicates that household sizes vary significantly in the sub-project area. Approximately 25% of households have 1–5 members, 30% have 5–10 members, 25% have 10–15 members, and 20% of households consist of 15 or more members.

4.4.8.11 Family System

Approximately 50% of the community prefers living in a joint family system, while 50% opt for a nuclear family arrangement. In joint families, the eldest male typically assumes responsibility for all members and acts as the primary decision-maker, especially regarding public and community matters. This family structure also provides a strong social safety net during periods of unemployment or financial hardship, supporting vulnerable groups such as poor women, the elderly, the infirm, and orphans. Communities consider the joint family system more economical, as members often work together on the same land and pool their incomes to sustain the entire household, including those unable to work.

4.4.8.12 Health Problems

Based on the initial baseline survey, the communities in the project area face several health challenges. The most common illnesses include malaria, acute respiratory infections (ARI), diarrhea, cardiac problems, and eye infections. Limited access to healthcare facilities, poverty, and seasonal migration of residents contribute to delayed treatment and poor health outcomes. These conditions highlight the need for improved medical services and awareness programs to support the well-being of the local population.

4.4.8.13 Poverty Distribution

According to BRACE PSC census, district Jhal Magsi is on 5th position in terms of total number of poor households falling in (0-23) poverty band. Overall, 58.5% households fall in (0-23) poverty band and the remaining 41.5% households fall in (24-100) poverty band. Moreover, 15.4% households fall in Ultra Poor (0-11), 26% households fall in Vulnerable Poor (12-18), 17% households fall in Transitory Poor (19-23) and 41.5 % households fall in non-poor (24-100) poverty band. (SOURCES: BRDCEP, RSPN)

4.4.8.14 Livestock

The average number and type of livestock owned in Akbar Minor villages are given in the following table:

Table 4-16:: Average No & Type of Livestock Ownership

Livestock Ownership	Akbar Minor Village Avg/HH
No. of Buffalos	-
No. of cows	-
No. of Goats	07
No. of Sheep	01
No. of Oxen	-
No. of chicken	5

4.4.8.15 Source of Fodder

In the project area, livestock is an important livelihood source, and fodder is mainly obtained from natural grazing lands, crop residues, and locally grown fodder crops. Seasonal availability is a major constraint, as most fodder is collected during the winter months when residents are present, while grazing during the dry season is limited. This reliance on natural and farm-based fodder reflects the semi-nomadic livestock practices and small-scale farming systems in the district.

4.4.8.16 Source of Livelihood and Income

The economy of Jhal Magsi District is predominantly rural and agriculture-based. Most households rely on farming, sharecropping, and livestock rearing as their primary sources of income, with seasonal crops grown under rain-fed and flood-based irrigation conditions. A significant portion of the population consists of small farmers, landless laborers, and nomadic or semi-nomadic communities who depend on daily wage labor, particularly during the agricultural season. Limited industrial activity and few alternative employment opportunities mean that income levels remain low, and many households experience seasonal unemployment, especially outside the winter cultivation period. Small-scale trading, government employment, and remittances provide supplementary income for a small segment of the population.

The baseline survey shows that agriculture is the primary source of income for households in Akbar Minor villages, with monthly earnings ranging from PKR 15,000 to PKR 20,000. All households also rely on secondary income sources such as livestock, transportation, small businesses, and salaried employment, generating an additional PKR 15,000 to PKR 20,000 per month.

4.4.8.17 Agriculture Tools and Farm Machinery

In Jhal Magsi District, agriculture is predominantly small-scale and largely traditional. Most farmers rely on basic hand tools such as hoes, spades, sickles, and plows for cultivation. Use of modern farm machinery is limited, with only a few farmers having access to tractors, threshers, or irrigation pumps. This reliance on manual labor and minimal mechanization reflects the low-income levels and small farm sizes in the district, which constrains productivity and limits the adoption of more efficient agricultural practices.

4.4.8.18 Agricultural landholding and cropping pattern

Tenancy is relatively common in the sub-project area, with 75% of agricultural land cultivated by tenants and 25% operated by owners. The land is generally fertile, supporting diverse crops. During the Kharif season (spring-summer), farmers primarily grow sugarcane, cotton, sorghum, and vegetables. In the Rabi season (autumn-winter, April to October), the main crops include wheat, pulses, and lentils.

4.4.8.19 Anticipated Losses due to the Project

The proposed sub-project is not expected to cause any loss of trees, cultivated land, or residences, as all activities will be carried out within the existing canal area.

4.4.8.20 Pit Latrines and Toilets

In the Akbar Minor area, approximately 30% of households have toilets; however, these are not connected to a proper sanitation system, and open defecation is still practiced in the community.

4.4.8.21 Land Ownership

Land in the Akbar Minor 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. Land ownership in Jhal Magsi is sometimes contested, with influential landlords and tribal chiefs have nearly 80% of the land is concentrated in the hands of a few landlords, leaving ordinary families with limited control over their traditional holdings.

Table 4-17 Member of Household Own Land in Rural Areas

Ownership	Percentage
Owner	44
Landless	56
Total	100

Source: MICS, 2010

4.4.8.22 Community-Based Organization (CBOs) and NGOs

The following NGOs are working in District Jhal Magsi

Table 4-18 Community-Based Organization (CBOs) and NGOs

S. No	Name of NGOs
1	Balochistan Rural Support Programme (BRSP)
2	United Nation International Children Emergency Fund (UNICEF)
3	Peoples Primary Health Initiative (PPHI)
4	World Health Organization (WHO)
5	Institute of Rural Management (IRM)
6	Benazir Income Support Programme (BISP)
7	National Commission for Human Development (NCHD)

4.4.8.23 Customary Institutions

The tribal system remains active in the sub-project area, where the Magsi tribe is the predominant customary authority.

4.4.8.24 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.

4.4.8.25 Law and Order Situation

The law-and-order situation in district Jhal Magsi, including the sub-project area, is normal and under the control of the district administration and law enforcement agencies (police and FC).

4.4.8.26 Community Cultural Properties

The following community cultural properties are found in Akbar Minor. 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 4-19: Community Cultural Properties

Village	Graveyard	Mosque	In RoW
Akbar Minor Village	5	06	No

4.4.8.27 Community Awareness about Sub-Project Works

Communities in the Akbar Minor 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, including sessions for the Local Grievance Redressal Committee, and the formation of farmers' organizations and women's development groups. Additionally, separate consultation meetings for men and women were held in Akbar Minor Village in Sep, 2025 to ensure inclusive community engagement and participation in the project.

4.4.8.28 Community Demands

During public consultations and socio-economic baseline assessments for the Akbar Minor sub-project in District Jhal Magsi, communities identified several priority needs essential for improving their living standards and reducing long-standing service gaps. The major demands raised by local households and community representatives are elaborated below:

- **Education Facilities**

Communities strongly emphasized the need for improved and upgraded educational institutions. This includes the construction of additional classrooms, provision of qualified teachers (especially female teachers), adequate boundary walls, safe drinking water, and functional washrooms in schools. They also expressed the need for a higher secondary school, as students currently travel long distances to access further education.

- **Health Services**

Residents reported limited access to quality healthcare. They requested the establishment or upgrading of Basic Health Units (BHUs), availability of trained medical staff, provision of essential medicines, maternal and child health services, and regular vaccination campaigns.

- **Water Supply and Sanitation**

A reliable supply of clean drinking water was one of the most urgent demands. Communities requested tube wells, hand pumps, and solarized water supply schemes. They also highlighted the need for improved sanitation systems, including drainage channels and proper waste disposal arrangements.

- **Road and Transport Infrastructure**

- Poor Road conditions hinder mobility and access to markets, schools, and health facilities. Communities demanded the rehabilitation of link roads, widening of pathways, and the provision of safe transport facilities, especially during the rainy season.

- **Livelihood and Agriculture Support**

As the majority of households depend on agriculture and livestock, communities requested support such as improved irrigation channels, availability of certified seeds, fertilizers, pesticides, livestock vaccination, and training on modern farming techniques.

- **Flood Protection Measures**

Given the widespread damage caused by the 2022 floods, communities reiterated the need for robust flood protection structures, including canal strengthening, embankments, culvert rehabilitation, and improved drainage to safeguard homes, agricultural fields, and public infrastructure.

- **Electricity and Energy Access**

Residents demanded expansion of the electricity network, reduction in load shedding, and the installation of solar systems for households, schools, and health facilities, particularly in areas not covered by the national grid.

- **Employment Opportunities**

Communities highlighted the need for job creation, skill development programs, and opportunities for youth especially women to enable sustainable income generation.

4.4.8.29 Consultation Meeting with Community and Elders for the Restoration of Akbar Minor

A consultation meeting was conducted with community members and local elders to discuss the restoration works of Akbar Minor. The session provided a platform for stakeholders to share their concerns, highlight priority needs, and offer valuable insights based on their traditional knowledge and experience of the area. Their feedback will play a key role in guiding project planning, ensuring community acceptance, and enhancing the effectiveness of restoration activities.

4.4.8.30 Positive impacts of Akbar Minor Project

The proposed Restoration of Damages to Escape Channel & Akbar Minor along with Structures, District Jhal Magsi is expected to generate substantial positive environmental and social impacts through rehabilitation of damaged hydraulic infrastructure, restoration of flow conveyance capacity, and improvement of irrigation and drainage performance within the project area. The project has been planned to restore damaged channel sections and associated hydraulic structures affected by previous flood events, thereby improving operational efficiency and resilience of the irrigation system.

The scheme is expected to provide protection and operational benefits to approximately 5,419 acres of land within the command area by improving water conveyance, reducing localized

flooding, and minimizing disruption of irrigation supplies caused by damaged channel sections and structures. Rehabilitation of the Escape Channel and Akbar Minor will improve flow regulation and support efficient management of irrigation and drainage water within the protected area.

The project will contribute toward reduction of flood risks, improvement of drainage performance, and mitigation of erosion and sediment deposition within vulnerable reaches. Restoration works including repair of damaged structures, rehabilitation of embankments, channel improvement, strengthening of protection works, and restoration of hydraulic sections are expected to improve channel stability and reduce future damage risks during high-flow events.

From an environmental perspective, improved hydraulic performance will facilitate efficient disposal of excess flows, minimize water stagnation, reduce localized inundation, and support protection of agricultural lands and surrounding infrastructure. These measures are expected to improve environmental conditions and strengthen resilience of the area against future climate-induced hydrological stresses.

Socially, the project will improve reliability of irrigation supplies, protect livelihood resources dependent on agriculture, and reduce disruptions caused by damaged infrastructure and flood events. Restoration of the system will improve accessibility, enhance agricultural stability, and support livelihood security of communities' dependent on the irrigation network.

Construction activities will also generate temporary employment opportunities through engagement of local labor in excavation, rehabilitation works, structure repairs, embankment strengthening, desilting, and associated civil works, contributing short-term economic benefits to surrounding communities.

Overall, the project is expected to provide long-term environmental and socio-economic benefits through restoration of hydraulic infrastructure, protection of approximately 5,419 acres of land, reduction of flood and drainage-related impacts, enhancement of irrigation performance, and strengthening of climate resilience within District Jhal Magsi.

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), Annexure – V. 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 government departments and local administration, including district and tehsil-level officials.

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 sub-project areas. A total of Nineteen 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.

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 is provided in Annexure-X.

Table 5-1 Details of Non-Institutional Consultations

Location	No. of Respondents	Date
Rasool Abad	3	06-09-2025
Nushki Jadeed	4	06-09-2025
Ahmad Abad	3	06-09-2025
Panchpai Jadeed	6	15-09-2025
Gandakha Baal	4	15-09-2025
Women Consultations at Akbar Minor Rasool Abad, Noushki Jadeed Village	11	15-09-2025
Women Consultations at Ahmed Abad, Punjpai	8	15-09-2025
Others	20	
Total	59	

5.4 KEY ISSUES RAISED BY NON-INSTITUTIONAL STAKEHOLDERS

Consultations were held with local community members and elders along the Akbar Minor Canal to discuss prevailing issues and post-flood conditions. The discussions highlighted several critical challenges faced by the community.

- The 2022 floods caused extensive damage to canal infrastructure, including embankments and associated structures.
- Embankments and canal systems were severely eroded and weakened due to prolonged flooding.
- Significant destruction of irrigation infrastructure has disrupted water management and agricultural activities.
- Sanitation systems are largely inadequate, and access to safe drinking water remains extremely limited.
- Poor hygiene services and the lack of clean water pose serious public health risks to the community.

These issues were carefully reviewed during ESMP preparation. While some concerns (e.g., provision of social infrastructure fall outside the scope of the Subproject, construction-related risks and temporary impacts have been addressed through targeted mitigation measures, including traffic and construction safety management, community health and safety provisions, labor management measures, access management, and grievance redress mechanisms.

5.5 INSTITUTIONAL CONSULTATIONS

Stakeholder engagement constitutes an integral component of effective project planning and implementation, ensuring that relevant government institutions and stakeholders remain adequately informed and actively involved throughout the project cycle. In accordance with the requirements of the World Bank Environmental and Social Framework (ESF), particularly Environmental and Social Standard (ESS-10) on Stakeholder Engagement and Information Disclosure, inclusive and transparent consultations contribute to improved environmental and social performance, strengthened institutional coordination, and informed decision-making during project implementation.

As part of the stakeholder engagement process for the project, institutional consultations were conducted with key government departments and relevant stakeholders regarding the proposed restoration works. The consultations were carried out by the Environmental and Social Team of Cameos Architects & Consultants in coordination with the district administration and line departments.

The consultation meetings were attended by Deputy Commissioner Syed Rehmatullah, Assistant Commissioner Abdul Majeed Muhammad Hossani, Sub-Divisional Officer (Irrigation) Farukh Khokar, and Agriculture Officer Khalil Mengal, along with representatives of Cameos Architects & Consultants, including Shakoore Kakar (Social Safeguard Specialist), Nageeb Ullah Kakar (Social Safeguard Specialist), Sidra (Gender Specialist), Mir Zarak (Social Organizer), and Mili Khan (Junior Environmental Specialist). During the meetings, the participants were briefed on the objectives of IFRAP, the scope of the proposed subproject, implementation arrangements, anticipated environmental and social impacts, and the applicable environmental and social safeguards requirements.

Discussions focused on the existing flood-related challenges within the project area, the proposed restoration and strengthening measures, project implementation strategy, and the expected benefits to local communities and agricultural lands. The Voluntary Land Donation (VLD) process was also discussed, and it was clarified that no permanent land acquisition is anticipated under the proposed restoration works. The Agriculture Department highlighted the significance of the project in reducing flood damages to agricultural lands and improving the resilience of farming communities within the project area.

Law and order conditions within the project area were also reviewed during the consultations. The district administration confirmed that no significant security concerns currently exist that could adversely affect project implementation. However, continued coordination with district authorities and relevant law enforcement agencies was recommended to ensure the safe and uninterrupted execution of project activities throughout the construction period.

All participating officials expressed their support for the proposed intervention and assured full cooperation from their respective departments during project implementation. The consultations concluded with a shared understanding regarding the importance of continuous stakeholder engagement, effective inter-departmental coordination, and regular communication among all

stakeholders to ensure environmentally and socially sustainable implementation of the subproject.

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 subproject site and PIU offices and will be shared upon request.

Regular consultations will be conducted before and during construction to keep communities informed of construction schedules, potential disruptions, and safety measures. Detail meetings will be held at the initiation of construction work about the GRM mechanism and awareness sessions for the community will be part of the ESMP implementation. 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 consequent operation of the Subproject is expected to impact the biophysical and social environment. These impacts will be minor, local, temporary, short-term and reversible as well positive impacts, since the scope is the Restoration of Damages to Escape Channel and Akbar Khan Minor along with Structures.

This section discusses the potential E&S impacts of the proposed Subproject activities, predicts the magnitude of the impact, assesses their significance, identifies mitigation measures to minimize the adverse impacts, and evaluates the residual impacts, if any, of the Subproject.

6.2 ASSESSMENT METHODOLOGY

The potential E&S impact of a development activity is identified on the basis of concerns raised by stakeholder, particularly the local community, technical guidelines, and professional opinion of the project team. The existing E&S conditions of the Subproject are categorized in the context of impact analysis by following a set of steps. The steps followed for impact assessment are described 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	The final step in the impact assessment process is

	requirements	identification of minimum monitoring requirements. The scope and frequency of the monitoring required depends on the residual impact. The purpose of monitoring is to confirm that the impact is within the predicted limits and to provide timely information if an impact is exceeding acceptable limits.
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6.3 SCREENING OF POTENTIAL E&S IMPACTS

The preliminary environmental assessment for the Subproject has been undertaken using the Rapid Environmental Assessment (REA) Checklist for Restoration of Damages to Escape Channel and Akbar Minor along with structures. The REA is used for identification and screening of likely E&S impacts. Table 6.2 lists impacts against different Subproject activities.

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

Leopold Matrix (LM) is a procedure for the evaluation of impact of a proposed development activity on the biophysical and socioeconomic environment. The LM provides a system for the analysis and numerical weighting of probable impacts. The analysis does not produce an overall quantitative rating; instead, it portrays many value judgments. A primary purpose is to ensure that the impact of alternative actions is evaluated and considered in the planning of Subproject.

This matrix has horizontal axis which has the impact characteristics, and the vertical axis has existing E&S components which may be affected during the Subproject implementation. This provides a format for comprehensive review of the interactions between proposed actions and environmental factors.

E&S impacts are evaluated against the existing environment and evaluating potential impacts through descriptions of how an environmental effect will occur, how the Subproject will interact with the E&S conditions, and how mitigation measures reduce or eliminate the effect. The anticipated impacts can be categorized as:

Direct Impacts: Direct impacts occur through direct interaction of an activity with E&S component. For example, a discharge of an effluent from project site may lead to slight contamination of the site or soil.

Indirect Impacts: Indirect impacts are not a direct result of the project, often produced away from or because of a complex impact pathway. The indirect impacts are also termed as secondary or even third level impacts. For example, sulphurs in ambient air rise due to emissions during the project activities but in this restoration activity of channels and damaged structures there are no such impacts.

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), the assessment has examined the potential for cumulative environmental and social impacts that could arise from the proposed sub-project in conjunction with other existing, ongoing, or reasonably foreseeable future developments within its Area of Influence (AoI). The analysis included consultations with relevant district and provincial departments, review of available development plans and records, and field reconnaissance to identify any parallel or planned infrastructure activities that may interact with the proposed interventions at Akbar Minor and Escape Channels (FPB).

The review confirmed that no major infrastructure, industrial, agricultural, or settlement expansion projects currently exist or are planned in the vicinity that could result in additive or synergistic impacts when combined with the proposed works. The sub-project primarily involves the rehabilitation and strengthening of an existing flood protection embankment within an already disturbed corridor. Consequently, the potential environmental and social impacts are limited in spatial extent, short-term in duration, and readily mitigable through the measures prescribed in this ESMP.

Implementation of the mitigation and monitoring measures outlined in Sections 7 and 8 will further minimize any residual impacts that could arise during construction and operation phases. Based on the nature, scale, and location of the sub-project, as well as the absence of other significant concurrent activities in the surrounding area, no adverse cumulative impacts are anticipated. Conversely, the sub-project is expected to yield beneficial cumulative outcomes by improving regional flood resilience, protecting agricultural lands, settlements, and critical infrastructure, and thereby contributing to enhanced socio-economic stability and disaster preparedness within the project area.

Environmental Component	Impact Characteristics						
	Direction	Duration	Location	Frequency	Extent	Significance	Reversibility

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

	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.	Environmental Component	Physical Environment								Ecological Environment		Socio economic Environment					
		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
	Project Activities																
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 & SOCIAL IMPACTS AND MITIGATION MEASURES

This section presents the environmental and social impacts associated with the Restoration of Damages to Escape Channel and Akbar Khan Minor along with Structures, District Jhal Magsi. The assessment covers the design, construction and operation stages of the sub-project.

The sub-project mainly comprises rehabilitation of Super Passage No. 5 at RD 4+800, Super Passage No. 7 at RD 7+300 along the Escape Channel, and the Village Road Bridge / culvert at RD 3+120 over Akbar Khan Minor. The works include repair and rehabilitation of damaged concrete components, reconstruction of eroded approaches, repair of lining, strengthening of abutments, rehabilitation of wing walls, provision of aprons and scour protection, deck slab replacement where required, and restoration of safe hydraulic and community access functions.

The assessment follows the World Bank Environmental and Social Framework, applicable national and provincial requirements, and the mitigation hierarchy of avoidance, minimization, restoration and compensation where applicable.

6.5.1 ENVIRONMENTAL IMPACTS

6.5.1.1 Topography, Soil Stability and Structural Footprint

The sub-project will be implemented within the existing disturbed footprint of the Escape Channel and Akbar Khan Minor structures. No major change in regional topography is anticipated. However, localized soil disturbance may occur due to excavation, removal of damaged material, reconstruction of approaches, backfilling, concrete works and temporary stockpiling.

Impacts / Risks

Design Stage

- Inadequate design of approaches, slopes, transitions, aprons or scour protection may increase the risk of localized erosion, settlement or structural instability.
- Poorly planned construction access, stockpile locations or temporary diversion arrangements may increase disturbance outside the approved footprint.
- Inadequate drainage around the restored structures may result in localized ponding, flow concentration or erosion.

Construction Stage

- Excavation, dismantling of damaged components, removal of silt/debris and earthworks may cause temporary soil erosion and sediment movement.
- Improper stockpiling of excavated material may obstruct flow paths or affect adjoining agricultural land.
- Fuel, oil, lubricants and concrete washout may contaminate soil if not properly handled.
- Borrow material extraction from unauthorized areas may result in land degradation, ponding and safety risks.
- Movement of construction machinery may compact soil and damage adjacent productive land if access is not controlled.

Operation Stage

- No significant long-term adverse impact on topography is anticipated if works are completed as per approved design.
- Localized erosion or scour may occur near wing walls, aprons, approaches or culvert outlets if maintenance is inadequate.

- Debris accumulation may affect flow behaviour and cause localized erosion or backwater effects.

Mitigation Measures

Design Stage

- The design shall remain limited to the existing approved footprint of the Escape Channel and Akbar Khan Minor structures.
- Hydraulic and structural design shall include adequate approach protection, wing walls, aprons, lining repair, scour protection and erosion-resistant transitions.
- Finished levels, side slopes and approach geometry shall be designed to avoid water ponding, flow concentration and uncontrolled erosion.
- Temporary access routes, stockpile areas and construction working limits shall be identified in advance to avoid unnecessary disturbance of adjoining agricultural land and community access routes.
- Borrow material requirements shall be assessed during design and sourced only from approved locations.

Construction Stage

- Excavation and backfilling shall be carried out in a phased manner, limiting the area of exposed soil at any one time.
- Exposed surfaces shall be compacted, dressed or temporarily protected as soon as practicable.
- Excavated material shall be stockpiled only at approved locations away from active flow paths, irrigation sections, access tracks and agricultural fields.
- Fuel storage, refuelling and equipment maintenance shall be carried out on impervious surfaces with drip trays, spill kits and secondary containment.
- Concrete washout shall be collected in designated areas and shall not be discharged into the Escape Channel, Akbar Minor, drains or agricultural land.
- Borrow material shall be obtained only from PIU/CSC-approved sources and borrow areas shall be restored after use through re-grading, drainage improvement and removal of unsafe depressions.
- Construction machinery shall operate only within designated access routes and work areas.

Operation Stage

- PIU/Irrigation Department shall inspect restored structures before and after the monsoon season and after high-flow events.
- Erosion, settlement, cracking, scour or damage to wing walls, approaches, aprons and lining shall be repaired promptly.
- Debris and silt accumulation near hydraulic openings shall be removed periodically to maintain design flow capacity.
- Unauthorized dumping, excavation or obstruction near restored structures shall be prohibited.

6.5.1.2 Climate Change and Climate Resilience

The sub-project is a climate resilience intervention intended to restore damaged hydraulic structures and improve the reliability of irrigation and drainage functions under recurrent flood conditions.

Impacts / Risks

Design Stage

- If recent flood behaviour and future climate-related flood intensities are not considered, restored structures may remain vulnerable to high flows, scour and erosion.
- Inadequate freeboard, apron protection or approach strengthening may reduce the long-term resilience of the super passages and Akbar Minor crossing.

Construction Stage

- Unexpected rainfall or flood flows during construction may damage incomplete works, erode temporary approaches or create unsafe working conditions.
- Temporary flow obstruction during works may increase localized flooding or erosion risk.

Operation Stage

- Increased rainfall intensity and future flood events may place higher hydraulic stress on the restored super passages, culvert/VRB, wing walls, aprons and approaches.
- Poor maintenance may reduce climate resilience benefits over time.

Mitigation Measures

Design Stage

- The restoration design shall be reviewed against the approved design discharge and recent flood damage patterns.
- Super Passage No. 5 at RD 4+800 and Super Passage No. 7 at RD 7+300 shall be rehabilitated to restore their hydraulic conveyance capacity and structural stability.
- The Akbar Khan Minor VRB/culvert at RD 3+120 shall be strengthened to maintain safe local access and hydraulic continuity.
- Climate resilience measures shall include strengthened concrete repair, adequate apron/scour protection, wing wall rehabilitation, approach reconstruction, lining repair and erosion protection.
- Design assumptions shall consider extreme rainfall, high-flow events, sediment movement and debris blockage risks.

Construction Stage

- Major excavation and structural rehabilitation activities shall preferably be scheduled during low-flow periods.
- Temporary diversion, flow bypass or staged construction arrangements shall be provided where required to maintain hydraulic continuity.
- Construction materials, spoil and machinery shall not be placed in active flow channels or drainage paths.
- The Contractor shall maintain emergency preparedness arrangements for sudden rainfall, flash flood warnings and evacuation of machinery/workers.
- Incomplete works shall be protected from erosion before forecast rainfall or high-flow events.

Operation Stage

- Restored structures shall be inspected before each monsoon season and after major flow events.
- Blockages, debris and sediment accumulation shall be removed from hydraulic openings.
- Damaged aprons, wing walls, lining, approaches and protection works shall be repaired without delay.
- Flood damage inspection records shall be maintained by the Irrigation Department/PIU and corrective actions shall be documented.

6.5.1.3 Ambient Air Quality

Air quality impacts will mainly occur during construction due to excavation, material transport, stockpiling, concrete works and operation of machinery.

Impacts / Risks

Design Stage

- Poor selection of camp sites, stockpile areas and haul routes may expose nearby communities to dust and vehicle emissions.
- Inadequate planning of material transport may increase dust nuisance along village access routes.

Construction Stage

- Dust may be generated from excavation, dismantling, loading/unloading, hauling of earth material, stockpiles and movement of vehicles on unpaved routes.
- Exhaust emissions may arise from construction machinery, generators, trucks and concrete mixers.
- Dust deposition may affect nearby houses, crops, trees and workers.

Operation Stage

- No significant air quality impact is anticipated during operation.
- Minor dust may occur during occasional maintenance or desilting activities.

Mitigation Measures

Design Stage

- Camp sites, stockpile areas and haul routes shall be selected away from settlements, schools, mosques and sensitive receptors to the extent practicable.
- Haul routes shall be planned to minimize movement through densely settled areas.
- Contract documents shall include requirements for dust suppression, vehicle maintenance and emission control.

Construction Stage

- Water sprinkling shall be carried out on exposed surfaces, haul roads, access routes, stockpiles and excavation areas, especially during dry and windy conditions.
- Fine material, excavated soil and aggregates shall be covered during transportation.
- Stockpiles shall be kept compact, dampened when required, and located away from houses, crops and active flow paths.

- Construction machinery and vehicles shall be maintained in good working condition to minimize smoke and emissions.
- Open burning of waste, packaging material, vegetation or construction debris shall be strictly prohibited.
- Workers exposed to dusty conditions shall be provided with dust masks or respirators.
- Speed limits shall be enforced for construction vehicles on unpaved access routes.

Operation Stage

- No routine air quality mitigation is required during normal operation.
- During maintenance/desilting, dust suppression and controlled material handling shall be applied where required.

6.5.1.4 Noise and Vibration

Noise and vibration impacts will be temporary and mainly associated with construction machinery, dismantling of damaged concrete, material transport, excavation and compaction.

Impacts / Risks

Design Stage

- Inadequate planning of construction timing and machinery movement may increase disturbance to nearby settlements and sensitive receptors.

Construction Stage

- Noise may be generated by excavators, loaders, compactors, generators, concrete mixers, trucks and cutting/breaking equipment.
- Vibration may occur during dismantling, compaction and heavy vehicle movement.
- Nearby communities, mosques, schools and livestock may experience temporary disturbance.
- Workers may be exposed to high noise levels.

Operation Stage

- No significant noise or vibration impact is anticipated during operation.
- Minor short-term noise may occur during maintenance activities.

Mitigation Measures

Design Stage

- Contract documents shall require the Contractor to prepare a construction schedule that avoids unnecessary night-time work near settlements.
- Work zones, access routes and machinery yards shall be planned to reduce disturbance to sensitive receptors.

Construction Stage

- Noisy activities shall be restricted to daytime hours, except where emergency works are required.
- Equipment shall be fitted with silencers/mufflers and maintained in good condition.
- Pressure horns and unnecessary honking shall be prohibited near settlements, mosques, schools and work sites.
- Advance notice shall be provided to communities before high-noise activities.

- Workers exposed to high noise levels shall be provided with earplugs or earmuffs.
- Equipment generating abnormal noise or vibration shall be repaired or removed from site.
- Noise monitoring shall be carried out at representative sensitive locations if complaints are received or if high-noise works continue for extended periods.

Operation Stage

- No regular mitigation is required.
- Maintenance works shall follow the same daytime scheduling and noise-control measures applied during construction.

6.5.1.5 Surface and Groundwater Quality

The Escape Channel and Akbar Minor are hydraulic systems; therefore, protection of water quality and flow continuity is critical during rehabilitation works.

Impacts / Risks

Design Stage

- Poor design of temporary diversions or drainage arrangements may increase turbidity, ponding or contamination risks.
- Inadequate siting of camps, fuel storage and workshops may increase the likelihood of water contamination.

Construction Stage

- Excavation, silt removal, concrete repair and approach reconstruction may increase turbidity and sediment load.
- Fuel, oil, lubricants, cement slurry, concrete washout and wastewater may contaminate surface water if not controlled.
- Construction debris may enter watercourses and reduce flow capacity.
- Sanitary wastewater from labour camps may pollute soil and groundwater if not properly managed.

Operation Stage

- No significant adverse impact on surface or groundwater quality is anticipated.
- Sediment and debris accumulation may affect hydraulic performance if not periodically removed.

Mitigation Measures

Design Stage

- Temporary flow management arrangements shall be incorporated into construction planning.
- Camp sites, workshops, fuel storage and machinery yards shall be located away from watercourses and irrigation/drainage channels to the extent practicable.
- Design shall include protection measures to avoid erosion and sediment release near repaired structures.

Construction Stage

- Construction works within or near flow sections shall be phased to minimize disturbance to active water flow.

- Silt curtains, temporary bunds, sediment traps or settling arrangements shall be used where required to control turbidity.
- Construction debris, cement bags, concrete waste and excavated material shall not be dumped into channels, drains or agricultural land.
- Concrete washout shall be collected in designated lined pits and disposed of after hardening at approved locations.
- Fuel and lubricants shall be stored in covered, bunded areas with spill kits available on site.
- Vehicle and machinery washing shall be prohibited near watercourses.
- Labour camps shall have septic tanks/soakage arrangements or other approved sanitation systems.
- Spill incidents shall be reported immediately, cleaned up and recorded.

Operation Stage

- Periodic desilting and removal of debris shall be carried out to maintain flow capacity.
- Any visible contamination, illegal dumping or obstruction near the restored structures shall be reported and removed.
- Post-flood inspections shall include checking of water flow, sediment deposition and erosion around the structures.

6.5.1.6 Waste, Spoil and Sediment Management

The works will generate construction debris, excavated soil/silt, damaged concrete, packaging material, domestic waste from camps and small quantities of oily/hazardous waste. (Annexure – R)

Impacts / Risks

Design Stage

- Lack of identified disposal sites may lead to unmanaged dumping of spoil or debris.
- Failure to assess sediment reuse/disposal requirements may result in inappropriate use of contaminated or unsuitable material.

Construction Stage

- Improper disposal of dismantled concrete, excavated spoil and silt may obstruct flow paths, damage agricultural land or create nuisance for communities.
- Hazardous waste such as used oil, oily rags and contaminated soil may pollute soil and water.
- Domestic waste from labour camps may attract vectors and create sanitation issues.
- Unscreened sediment may be reused inappropriately if contamination is present.

Operation Stage

- Minor waste may arise from periodic maintenance, debris removal and desilting.
- Unmanaged disposal of maintenance waste may create localized environmental impacts.

Mitigation Measures

Design Stage

- The ESMP/contract documents shall identify requirements for spoil handling, waste segregation, approved disposal locations and sediment testing where required.

- Reuse of clean excavated material shall be preferred where technically suitable and approved by the CSC.
- Disposal sites shall be approved by PIU/CSC and shall be located away from watercourses, settlements, agricultural land and sensitive receptors.

Construction Stage

- Waste shall be segregated at source into reusable material, inert construction waste, domestic waste and hazardous/oily waste.
- Clean excavated material may be reused for backfilling, approach restoration or site levelling after CSC approval.
- Dismantled concrete and unusable debris shall be removed to approved disposal sites.
- Spoil shall not be dumped in active flow paths, irrigation/drainage channels, agricultural fields or near houses.
- Used oil and oily waste shall be stored in sealed containers and handed over to authorized recyclers or approved handlers.
- Domestic waste shall be collected regularly and disposed of through approved municipal/local arrangements.
- Open burning and unauthorized dumping shall be prohibited.
- Spill kits shall be available at fuel storage, refuelling and maintenance areas.

Sediment Testing, Reuse and Disposal Protocol

- Routine excavation is expected to generate mostly alluvial silt, sand and gravel from previously disturbed channel sections.
- Sediment testing shall be required where visual or olfactory screening indicates possible contamination, such as oil sheen, fuel odour, black staining, unusual colour, nearby dumping, proximity to maintenance/fuel areas or community complaints.
- Where testing is triggered, the Contractor shall collect at least one composite sample from the affected stockpile or work location before reuse or off-site disposal.
- Testing parameters shall include pH, electrical conductivity, moisture content, oil and grease/TPH, total suspended solids and selected heavy metals, including arsenic, cadmium, chromium, lead and mercury, where relevant.
- Clean material may be reused with CSC approval.
- Contaminated or unsuitable material shall be isolated, covered, labelled and disposed of at PIU/CSC-approved disposal sites.
- The Contractor shall be responsible for sampling, testing through an accredited laboratory, safe storage and disposal. CSC shall verify records, and PIU shall review compliance through monthly E&S monitoring reports.

Operation Stage

- Debris and silt removed during maintenance shall be disposed of at approved locations.
- Clean silt may be reused for land levelling only where it does not affect drainage, agricultural productivity or community access.
- Maintenance waste shall not be dumped into channels, drains or flood paths.

6.5.1.7 Vegetation and Tree Removal

The sub-project is expected to involve limited vegetation clearance within the approved work areas, access routes, camp areas and temporary stockpile locations. No protected area or critical habitat is located within the sub-project footprint. Sample re-plantation plan is annexed as annexure – U.

Impacts / Risks

Design Stage

- Poorly planned access routes or camp locations may require unnecessary vegetation removal.
- Lack of tree inventory may result in unrecorded vegetation loss.

Construction Stage

- Limited removal of shrubs, grasses or scattered trees may occur at work fronts, camps, access routes or stockpile areas.
- Dust deposition may affect nearby crops and trees.
- Machinery movement may damage crops or vegetation outside the approved footprint.

Operation Stage

- No significant adverse ecological impact is anticipated.
- Restored areas may remain barren if temporary disturbed surfaces are not stabilized.

Mitigation Measures

Design Stage

- Work areas, camps and access routes shall be planned to avoid unnecessary tree cutting and disturbance to crops.
- Any tree removal shall be identified, recorded and approved before cutting.
- Existing access routes shall be used to the extent possible.

Construction Stage

- Vegetation clearance shall be limited to the minimum area required for works.
- Trees and crops outside the approved work boundary shall be protected.
- Dust suppression shall be implemented near agricultural fields and vegetation.
- Machinery movement shall be restricted to designated routes.
- Any unavoidable tree loss shall be compensated through plantation at a minimum ratio of 1:5, or as required by the Forest Department/PIU.
- Indigenous and locally suitable species shall be preferred for plantation.
- Plantation shall be maintained until establishment.

Operation Stage

- Replanted areas shall be monitored for survival.
- Any damaged vegetation protection or restored surfaces shall be repaired during maintenance.
- No additional vegetation clearance shall be allowed without approval.

6.5.2 SOCIAL IMPACTS

6.5.2.1 Labour and Working Conditions

Construction will involve skilled and unskilled workers for excavation, concrete repair, reinforcement, formwork, backfilling, lining repair, approach reconstruction, deck repair, apron works and related activities.

Impacts / Risks

Design / Pre-Construction Stage

- Inadequate inclusion of labour, OHS, camp and worker GRM requirements in contract documents may weaken compliance.
- Lack of workforce planning may increase reliance on non-local labour and associated social risks.

Construction Stage

- Workers may be exposed to accidents involving excavation, lifting, concrete works, machinery, falling objects, slips/trips and traffic movement.
- Dust, noise, vibration, heat stress and manual handling may affect worker health.
- Poor camp conditions may lead to sanitation, hygiene and disease risks.
- Risk of child labour, forced labour or unfair labour practices may arise if contractor controls are weak.
- Workers may lack an accessible grievance mechanism.

Operation Stage

- O&M staff may face safety risks during inspection, debris removal, desilting and repair after flood events.

Mitigation Measures

Design / Pre-Construction Stage

- Contract documents shall include ESS2-compliant labour requirements, OHS obligations, worker Code of Conduct, prohibition of child and forced labour, worker GRM and camp management requirements.
- The Contractor shall prepare a site-specific OHS Plan and Labour Management arrangements before mobilization.
- Local labour shall be preferred where skills are available.

Construction Stage

- Workers shall be provided with task-specific PPE, including helmets, safety boots, gloves, high-visibility vests, eye protection, hearing protection, masks and fall protection where required.
- OHS induction and toolbox talks shall be conducted regularly.
- Excavations, work at heights, lifting operations, concrete works and machinery operations shall be supervised by competent personnel.
- First-aid kits, trained first-aiders and emergency transport arrangements shall be available at active work sites.

- Camps shall provide safe drinking water, sanitation, washing facilities, solid waste collection and adequate drainage.
- Child labour, forced labour and bonded labour shall be strictly prohibited.
- Worker age verification and employment records shall be maintained.
- A worker GRM shall be established and explained to all workers.
- OHS incidents, near misses, training and inspections shall be recorded and reported.

Operation Stage

- O&M personnel shall use appropriate PPE during inspection, desilting and repair works.
- Maintenance activities shall follow safe work procedures, especially after floods or during unstable site conditions.
- Emergency response and reporting procedures shall remain available for serious incidents.

6.5.2.2 Community Health and Safety

Nearby communities may be affected by construction activities, machinery movement, open excavations, temporary access restrictions and works near village routes or hydraulic structures.

Impacts / Risks

Design Stage

- If access and safety arrangements are not considered during design, construction may create avoidable risks to pedestrians, livestock, tractors, motorcycles and local traffic.
- Inadequate hydraulic design may create long-term risks of blockage, backwater effects or localized flooding.

Construction Stage

- Community members may be exposed to accidents involving machinery, construction vehicles and open excavations.
- Children may enter active construction areas if access is not controlled.
- Dust, noise, traffic movement and temporary diversions may affect nearby settlements.
- Temporary obstruction of flow or access may create community safety risks during rainfall or high-flow periods.

Operation Stage

- Restored structures are expected to improve community safety by reducing damage to hydraulic infrastructure and maintaining access.
- Residual risk may remain if structures are blocked, damaged, poorly maintained or used unsafely by traffic/pedestrians.

Mitigation Measures

Design Stage

- Design shall provide safe structural transitions, protected approaches, adequate hydraulic openings and scour protection.
- Construction safety, access control and community movement requirements shall be included in contract documents.

- Community access needs around the Akbar Minor crossing and nearby agricultural routes shall be considered in construction planning.

Construction Stage

- Active work areas shall be fenced, barricaded and clearly demarcated.
- Open excavations, trenches and pits shall be protected with rigid barricades, warning signs and night reflectors/lights where required.
- Unauthorized public access, particularly by children, shall be prevented.
- Warning signs shall be installed in Urdu and locally understood language where needed.
- Community members shall be informed in advance about construction schedules, access restrictions and safety hazards.
- Emergency access shall be maintained for local communities, ambulances, Irrigation Department staff and local administration.
- A functional GRM shall be available for community complaints related to safety, access, dust, noise or construction conduct.

Operation Stage

- The Irrigation Department shall maintain the structures, remove debris and repair damage after high-flow events.
- Unsafe access, damaged parapets, eroded approaches or exposed hazards shall be repaired promptly.
- Communities shall be encouraged to report blockages, structural damage or safety concerns through the GRM/local Irrigation Department channels.

6.5.2.3 Traffic and Construction Safety Management

Traffic impacts are expected mainly during transportation of construction materials, movement of machinery and works at or near the Akbar Minor village road bridge/culvert.

Impacts / Risks

Design / Pre-Construction Stage

- Inadequate planning of haul routes, temporary diversions and access arrangements may disrupt local movement.
- Closure or partial closure of the Akbar Minor crossing without alternatives may affect access to fields, settlements and services.

Construction Stage

- Increased movement of trucks, tractors, loaders and other vehicles may increase accident risks.
- Temporary diversions may cause inconvenience, congestion or unsafe pedestrian movement.
- Construction near the VRB/culvert may restrict local traffic and livestock movement.
- Poorly marked work zones may increase risk of accidents during low visibility or night-time conditions.

Operation Stage

- Traffic conditions are expected to return to normal after construction.

- Restored bridge/culvert approaches are expected to improve local access and safety if properly maintained.

Mitigation Measures

Design / Pre-Construction Stage

- The Contractor shall prepare a site-specific Traffic and Construction Safety Management Plan before mobilization.
- Haul routes, temporary diversions, material delivery timing and access controls shall be agreed with CSC/PIU and local representatives.
- Temporary access arrangements shall be planned before any restriction at the village road bridge/culvert.

Construction Stage

- Trained flag persons/traffic marshals shall be deployed at active work fronts, access points and diversion locations.
- Diversion routes shall be clearly marked with signs, cones, barricades and reflectors.
- Speed limits shall be enforced near settlements, schools, mosques, markets and active work areas.
- Construction vehicles shall not be parked in a manner that blocks community access or flow paths.
- Night-time hazards shall be marked with reflectors or warning lights.
- Drivers shall be trained on safe driving, speed limits, community safety and route discipline.
- Advance notice shall be provided to communities for temporary closures or traffic diversions.
- Emergency vehicle access shall be maintained at all times.

Operation Stage

- Temporary signs, diversions and barriers shall be removed after completion.
- The restored road bridge/culvert approaches shall be maintained in safe condition.
- Any settlement, erosion or damage affecting traffic safety shall be repaired promptly.

6.5.2.4 Temporary Access Restriction and ESS5 Risks

No permanent physical displacement or permanent land acquisition is anticipated. However, temporary access restrictions may occur during construction at work fronts, approaches, access routes, the village road bridge/culvert and nearby agricultural tracks.

Impacts / Risks

Design Stage

- If temporary access needs are not mapped, construction may disrupt access to fields, homes, livestock routes, irrigation points or community facilities.
- Informal users may be affected if their access routes are not identified in advance.

Construction Stage

- Temporary restriction of access to agricultural land, houses, grazing areas or local tracks may occur.

- Farmers, livestock owners, pedestrians, motorcycles and tractors may face temporary inconvenience.
- Vulnerable households may be disproportionately affected if alternative access is not provided.

Operation Stage

- No access restriction is anticipated after completion.
- Restored structures are expected to improve safe access and hydraulic reliability.

Mitigation Measures

Design Stage

- Construction planning shall identify formal and informal access routes around Super Passage No. 5, Super Passage No. 7 and the Akbar Minor VRB/culvert.
- The design and construction sequence shall avoid private land and livelihood disruption to the extent practicable.
- Temporary access and diversion requirements shall be included in contractor obligations.

Construction Stage

- Safe temporary crossings, ramps, bypasses or alternative routes shall be provided before closing any existing access.
- Affected users shall be informed at least 72 hours before any access restriction.
- Access for pedestrians, livestock, tractors, motorcycles and emergency vehicles shall be maintained to the extent practicable.
- Any unanticipated livelihood or access impact shall be recorded, assessed and addressed under ESS5/RPF principles.
- Vulnerable households shall receive priority assistance where access restrictions affect their movement or livelihoods.
- Access-related complaints shall be recorded and resolved through the GRM.

Operation Stage

- Temporary access arrangements shall be removed only after permanent access is restored.
- Any remaining access damage caused by construction shall be repaired before demobilization.
- Operation-stage access complaints shall be addressed by the responsible O&M authority.

6.5.2.5 Impact on Downstream Population and Hydraulic Continuity

The sub-project is expected to improve the hydraulic performance and operational reliability of the Escape Channel and Akbar Khan Minor system. Downstream communities and irrigation beneficiaries may experience temporary construction-related impacts but are expected to receive long-term benefits from restored structures.

Table 6-7: Downstream Villages and Beneficiaries

Village	Households	Population	Distance from Sub-project Area
Rasool Abad	400	2,500	6 km
Nushki Jadeed	500	3,500	8 km
Ahmad Abad	450	3,000	4 km

Panchpai Jadeed	600	4,500	3 km
Bugti Goth	521	3,400	1 km
Gandakha Baal	500	4,000	0.5 km
Total	2,971	20,900	—

Impacts / Risks

Design Stage

- Inadequate hydraulic capacity, poor transition design or insufficient scour protection may affect downstream flow continuity.
- Improperly designed approaches, aprons or wing walls may cause flow concentration, erosion, backwater effects or sediment deposition.
- Failure to consider downstream users may create concerns over irrigation flow reliability.

Construction Stage

- Temporary obstruction or diversion of flow may affect irrigation and drainage continuity.
- Excavation, silt removal and concrete works may increase turbidity and sediment movement downstream.
- Construction activity may temporarily restrict access for downstream users and farmers.
- Poorly managed stockpiles or debris may enter flow sections and reduce conveyance capacity.

Operation Stage

- The project is expected to improve downstream hydraulic reliability and reduce future flood-related damage.
- Residual risks may include blockage, erosion, apron damage, approach settlement, culvert/super passage obstruction or structural damage during extreme flood events.
- Such risks may cause localized backwater effects, sediment deposition, temporary interruption of irrigation/drainage performance or access disruption.

Mitigation Measures

Design Stage

- Hydraulic and structural design shall verify the conveyance capacity of Super Passage No. 5, Super Passage No. 7 and the Akbar Minor VRB/culvert.
- Adequate scour protection, apron works, wing walls, parapets, approach protection and lining repair shall be included.
- The design shall maintain existing irrigation and drainage functions and shall not alter sanctioned water rights or approved hydraulic arrangements.
- Downstream flood and flow behaviour shall be considered in final construction sequencing and temporary diversion planning.

Construction Stage

- Works shall be phased to maintain hydraulic continuity to the extent practicable.
- Temporary diversion or bypass arrangements shall be provided where flow obstruction is unavoidable.
- Earthworks in active hydraulic sections shall preferably be undertaken during low-flow periods.

- Sediment control measures shall be implemented to reduce downstream turbidity and deposition.
- Construction debris, spoil and material stockpiles shall be kept away from flow paths.
- Downstream communities and irrigation beneficiaries shall be informed in advance of any temporary flow restriction.
- Any blockage, sediment accumulation or construction-related obstruction shall be removed immediately.
- Water-related complaints shall be separately recorded in the GRM register.

Operation Stage

- Irrigation Department/PIU shall inspect structures before and after monsoon/high-flow events.
- Blockages, debris and sediment deposits shall be removed promptly.
- Damaged aprons, wing walls, approaches, lining or deck components shall be repaired as soon as identified.
- Any high-flow damage shall be reported to PIU/CSC or the responsible O&M authority within 24 hours of identification.
- Long-term maintenance shall ensure continued hydraulic capacity and reduced downstream flood risk.

6.5.2.6 Water Rights, Drainage Use and Conflict Risks

The sub-project is limited to restoration of existing damaged structures and does not create a new command area, change sanctioned outlets, alter water allocations or introduce new water rights.

Impacts / Risks

Design Stage

- If design changes are perceived to alter flow distribution, concerns may arise among upstream and downstream users.
- Lack of early engagement may create misunderstanding regarding the purpose of the works.

Construction Stage

- Temporary flow interruption, sediment movement or partial obstruction may create disputes among farmers, upstream/downstream users or irrigation beneficiaries.
- Construction sequencing may be perceived as favouring one user group if not communicated clearly.

Operation Stage

- Improved structures are expected to reduce disputes by improving flow reliability.
- Future conflicts may arise if maintenance is poor, structures are blocked or unauthorized cuts/obstructions occur.

Mitigation Measures

Design Stage

- The design shall clearly maintain existing hydraulic functions and shall not alter approved water allocations.

- PIU/CSC shall consult relevant Irrigation Department field staff and local water users during planning of construction sequencing.
- Any design adjustment affecting flow behaviour shall be disclosed and discussed with relevant stakeholders.

Construction Stage

- Temporary flow restrictions shall be announced in advance to affected users.
- Flow continuity shall be maintained to the extent practicable through staged works or temporary bypass arrangements.
- The Contractor shall not block, divert or close any watercourse without approval from CSC/PIU and coordination with the Irrigation Department.
- Water-use grievances shall be acknowledged within 48 hours and resolved through the GRM in coordination with the Irrigation Department and local representatives.
- Unauthorized bunding, diversion, dumping or closure by workers or third parties shall be prohibited.

Operation Stage

- O&M arrangements shall ensure regular inspection and removal of blockages.
- Water-related complaints shall continue to be recorded and addressed through local Irrigation Department/project GRM channels.
- Any unauthorized modification affecting flow shall be removed in coordination with local authorities.

6.5.2.7 Community Access and Informal Crossings

Local communities may use formal and informal crossings around the Escape Channel, Akbar Minor and village road bridge for access to fields, settlements, markets, mosques, schools, grazing areas and services.

Impacts / Risks

Design Stage

- If existing informal crossings and access tracks are not identified, the construction plan may disrupt community movement.
- The design of approaches and temporary works may not adequately accommodate pedestrian, livestock and agricultural traffic.

Construction Stage

- Temporary closure or restriction of access may affect pedestrians, livestock, tractors, motorcycles and local vehicles.
- Unsafe temporary crossings may increase accident risks.
- Lack of communication may result in community dissatisfaction or conflict.

Operation Stage

- Restored structures are expected to improve access and safety.
- Poor maintenance of approaches or crossings may create future access and safety risks.

Mitigation Measures

Design Stage

- Existing formal and informal access points shall be mapped before construction.
- Construction sequencing shall be planned to maintain at least one safe access route where practicable.
- Temporary access requirements shall be included in the Contractor's method statement.

Construction Stage

- Safe temporary crossings, ramps, bypasses or alternative routes shall be provided where access is affected.
- Community representatives and affected users shall be consulted at least 72 hours before restrictions.
- Signboards shall be displayed in Urdu and locally understood languages where required.
- Flag persons shall be deployed where construction traffic intersects community movement.
- Emergency access for ambulances, local administration and Irrigation Department staff shall be maintained at all times.
- Access-related grievances shall be recorded and resolved promptly.

Operation Stage

- Permanent access shall be restored before demobilization.
- Approaches, crossings and safety features shall be inspected periodically.
- Any erosion, settlement or damage affecting community access shall be repaired.

6.5.2.8 Labour Influx and Social Conflict

The sub-project may require a limited number of non-local skilled workers in addition to local labour. If unmanaged, labour influx can create social tension or pressure on local resources.

Impacts / Risks

Design / Pre-Construction Stage

- Lack of labour planning may increase avoidable labour influx.
- Inadequate camp planning may create pressure on local water, sanitation and waste systems.

Construction Stage

- Worker-community conflicts may arise due to behavioural issues, cultural differences or competition for jobs.
- Labour camps may create sanitation, waste or nuisance issues if poorly managed.
- Non-local workers may unintentionally disrespect local customs if not oriented.

Operation Stage

- Labour influx impacts will cease after construction.

Mitigation Measures

Design / Pre-Construction Stage

- Local labour shall be prioritized where skills are available.
- Labour camp and workforce requirements shall be included in contractor planning.

- The Contractor shall appoint a Community Liaison Officer or focal person. (Annexure- M attached for reference)

Construction Stage

- All workers shall sign and follow a Worker Code of Conduct. (Annexure – A)
- Workers shall receive induction on local customs, acceptable behaviour, community relations, GBV/SEA/SH prevention and grievance channels.
- Labour camps shall provide adequate water, sanitation, drainage, waste management and security.
- Worker movement shall be managed to avoid nuisance to nearby communities.
- Community grievances related to worker conduct shall be addressed through the GRM.
- The Contractor shall coordinate regularly with local representatives to prevent and resolve conflicts.

Operation Stage

- Labour camps shall be dismantled, waste removed and sites restored.
- Any pending labour/community grievances shall be resolved before demobilization.

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

6.5.2.9 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 labor influx shall be managed through preventive, responsive, and enforcement-based measures.

- **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 behaviors, 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-centered 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 6-8: 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.

Activity	Impact	Duration	Affected Users
Rehabilitation of Super Passage No. 5 at RD 4+800 of Escape Channel	Temporary flow disturbance, construction noise, restricted access, and localized movement constraints	20 to 40 days	Farmers, local residents, canal users, and nearby road users
Rehabilitation of Super Passage No. 7 at RD	Temporary interruption of drainage	20 to 40 days	Downstream farmers, local communities, and

Activity	Impact	Duration	Affected Users
7+300 of Escape Channel	conveyance, excavation-related disturbance, and construction traffic		road users
Reconstruction of wing walls, parapets, and apron protection works	Temporary excavation activities, localized access restrictions, and construction noise	15 to 30 days	Adjacent landowners, local residents, and canal users
Rehabilitation of Village Road Bridge (Culvert) at RD 3+120 of Akbar Khan Minor	Temporary restriction of traffic movement, localized flow diversion, and construction-related disturbance	10 to 20 days	Local residents, road users, farmers, and canal users
Stockpiling and disposal of excavated material	Localized obstruction, dust generation, and temporary reduction in available working space	Duration of stockpile placement (typically 3–7 days)	Adjacent landowners and canal users
Movement of construction machinery and equipment	Temporary traffic disturbance, dust emissions, and safety risks near work areas	Throughout construction period	Local communities, farmers, and road users
Temporary flow diversion during structure rehabilitation (if required)	Localized reduction or interruption of flow and temporary ponding upstream	1 to 3 days	Downstream water users and farmers dependent on irrigation supplies

6.5.2.10 Cultural, Community and Chance-Find Impacts

No known archaeological or cultural heritage site has been identified within the proposed Akbar Minor/Escape Channel structures footprint. However, chance finds may occur during excavation. (Annexure – E is attached for reference)

Impacts / Risks

Design Stage

- Failure to include chance-find procedures in contract documents may delay appropriate response if cultural material is discovered.

Construction Stage

- Excavation may accidentally expose archaeological, historical, religious or cultural material.
- Construction activities may temporarily disturb local routines, religious practices or community events.

Operation Stage

- No cultural heritage impact is anticipated during operation.

Mitigation Measures

Design Stage

- Chance-find procedures shall be included in contract documents and explained to the Contractor.
- Worker induction shall include basic instructions on identifying and reporting chance finds.

Construction Stage

- If any archaeological or cultural material is discovered, work at the location shall stop immediately.
- The Contractor shall secure the area and inform CSC/PIU without delay.
- The Contractor shall prepare a brief report with photographs, location and description of the find.
- Work shall resume only after clearance from the competent authority/PIU/CSC.
- Construction scheduling shall respect prayer times, religious events and local community practices to the extent practicable.
- Workers shall respect local customs and community norms.

Operation Stage

- No operation-stage mitigation is required unless maintenance excavation results in a chance find, in which case the same procedure shall apply.

6.5.2.11 Physical Resettlement

The sub-project will be implemented within the existing footprint of the Escape Channel and Akbar Minor structures. No residential or commercial structures are expected to be affected.

Impacts / Risks

Design Stage

- If construction limits are not clearly defined, there may be risk of unintended encroachment beyond the approved footprint.

Construction Stage

- No physical displacement is anticipated.
- Temporary disturbance may occur near access routes or work areas but shall not require relocation of households or businesses.

Operation Stage

- No physical resettlement impact is anticipated.

Mitigation Measures

Design Stage

- Work boundaries shall be clearly defined on drawings and at site.
- Any proposed change in alignment or footprint shall be screened for resettlement impacts before approval.

Construction Stage

- Construction shall remain within the approved footprint and designated temporary work areas.
- If any unanticipated structure impact is identified, work in that area shall stop and PIU/CSC shall assess the issue under ESS5/RPF requirements before proceeding.

- No demolition or displacement shall occur without due process, consultation and approved mitigation.

Operation Stage

- No mitigation is required beyond maintaining the structures within the approved footprint.

6.5.2.12 Permanent Land Acquisition

No permanent land acquisition is anticipated for the sub-project at this stage, as works will be carried out within the existing hydraulic infrastructure footprint and associated approved temporary work areas.

Impacts / Risks

Design Stage

- Design changes or expanded work areas may create unforeseen land requirements.
- Use of private land for camps, access or stockpiles without agreement may create disputes.

Construction Stage

- Temporary use of land may be required for camps, stockpiles, access routes or machinery parking.
- Informal users or farmers may be affected if temporary land use is not properly agreed and restored.

Operation Stage

- No permanent land acquisition or land-use restriction is anticipated after completion.

Mitigation Measures

Design Stage

- The design shall avoid permanent acquisition and private land use to the maximum extent practicable.
- Any unavoidable land requirement shall be screened and managed in accordance with ESS5 and the project RPF.

Voluntary Land Donation shall not be used where it may affect vulnerable persons, livelihoods, access or create coercion. **Construction Stage**

- Temporary land use shall be based on documented agreement with the landowner/user, where applicable.
- Temporary use areas shall be restored after completion.
- No private land shall be used without prior agreement and approval by PIU/CSC.
- Any unanticipated land impact shall be recorded, assessed and resolved before works proceed in the affected area.

Operation Stage

- Temporarily used land shall be handed back in restored condition.
- Any remaining land-related grievance shall be resolved through the GRM before contractor demobilization.

6.5.2.13 Residual Impacts and Enhancement Benefits

Residual Impacts

Design Stage

- Residual design-stage risk will remain low if hydraulic, structural, access and safety requirements are fully incorporated into the final design and contract documents.

Construction Stage

- Residual impacts may include short-term dust, noise, traffic disruption, temporary access restriction, sediment movement and community inconvenience.
- These impacts are expected to be localized, temporary and reversible with implementation of the ESMP.

Operation Stage

- Residual operation-stage risks may include localized erosion, blockage, sediment deposition or structural wear if maintenance is inadequate.
- With regular inspection and maintenance, residual risks are expected to remain low.

Enhancement Benefits

- Restoration of damaged super passages and the Akbar Minor VRB/culvert will improve hydraulic performance and structural reliability.
- The sub-project will reduce risks of future damage to irrigation and drainage infrastructure.
- Downstream irrigation beneficiaries and nearby communities will benefit from improved flow continuity and reduced flood-related disruption.
- Temporary employment opportunities will be generated for local labour during construction.
- Improved structure safety and restored access will support local mobility, agriculture and community resilience.

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 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.

GRM will work at different levels as Workers GRM, Community level GRM and their committees at local level for both Male and Female Community members and then for any other like

institutional stakeholders or any one including civil society etc. Mechanism is established and is shared with the community and civil society and will be shared with the workers as well.

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. Worker 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 Jhal Magsi district.

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 Jhal Magsi 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 investigation results and the action is taken;

- e. 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;
- f. The PCC will review the Contractors response on the identified mitigation measures and the updated situation;
- g. 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 Specialist, 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 PSIA 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 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.

The quantitation monitoring indicators are given in Table 7.2 in addition to the mitigation measures in Table 7-3. These indicators use the ESMP baseline where available and set specific targets, units, frequencies and responsibilities for construction-stage monitoring.

Table 7-2: Monitoring Indicators

Indicator / Risk Area	Baseline	Target / Compliance Standard	Unit	Frequency	Responsibility
Rehabilitation of key structures	3 damaged/affected structures identified: Super Passage No. 5 (RD 4+800), Super Passage No. 7 (RD 7+300), and VRB/culvert at Akbar Khan Minor RD 3+120	3/3 structures restored as per approved design; 100% post-construction inspection completed	No. and %	Monthly and at completion	Contractor / CSC / PIU
Downstream flood/scour risk	Existing erosion/damage at structures and approaches	No unaddressed scour, blockage or approach-failure observations after flood/high-flow events; inspection report within 24 hours after any significant flow event	No. of observations; hours	Weekly and after high-flow events	Contractor / CSC
Community access and informal crossings	Existing village-road/farm access used by local communities	100% affected access points provided with safe temporary access or alternate route before restriction; emergency access maintained at all times	% access points	Daily during access restrictions	Contractor / CSC
Water-user grievances/conflicts	No recorded unresolved water-rights dispute at baseline consultations	100% water-use complaints acknowledged within 48 hours and resolved within GRM timeframe; 0 unresolved complaints beyond 15 working days	No. and %	Monthly	Contractor CLO / CSC Social Specialist / PIU
Sediment suitability for reuse/disposal	No known contamination; alluvial channel deposits expected	100% suspect sediment stockpiles visually screened; 100% triggered samples tested before reuse/disposal	No. samples; % stockpiles	At excavation/stockpiling	Contractor / CSC Environmental Specialist
Air quality/dust	Baseline PM10 79.76 µg/m³; PM2.5 26.81 µg/m³	PM10 ≤150 µg/m³ and PM2.5 ≤35 µg/m³ (24-hr NEQS/BEQS); water sprinkling at least twice	µg/m³; No./day	Monthly and complaint-based	Contractor / CSC

Indicator / Risk Area	Baseline	Target / Compliance Standard	Unit	Frequency	Responsibility
		daily during dry/windy conditions			
Noise	Baseline daytime noise approx. 35.5-40.0 dB(A)	Daytime noise at sensitive receptors ≤ 75 dB(A) NEQS/BEQS; 0 unresolved noise complaints	dB(A); No. complaints	Monthly and complaint-based	Contractor / CSC
OHS compliance	0 workers inducted at mobilization	100% workers inducted; 100% high-risk workers using PPE; 0 fatalities; all incidents reported within 24 hours	%; No. incidents	Daily/weekly	Contractor HSE Officer / CSC
Waste management	Construction waste expected from dismantling, excavation and camp operation	100% waste segregated and disposed/reused at approved locations; 0 open burning; disposal records maintained	%; No. records	Weekly/monthly	Contractor / CSC
GRM performance	GRM established for project	100% grievances logged; 100% acknowledged within 48 hours; $\geq 90\%$ resolved within agreed timeframe	No. and %	Monthly	PIU / CSC / Contractor

Table 7-3: 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&E C
Earthworks, embankment construction, borrow areas	Soil erosion, sedimentation, landform alteration	Optimize alignment; minimize cut-and-fill; erosion- Resistant slopes; phased excavations stabilize exposed soil; rehabilitate borrow pits; avoid productive agricultural land.	Contractor	Work fronts, embankments, borrow areas	Weekly during construction	Area of active erosion $\leq 5 \text{ m}^2$ per 500 m of embankment; all disturbed	✓	✓	
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 enhanced drainage; hydrology reviewed against recent floods and climate projections.	Design Consultant / PMU	Design stage	Once during design approval	Climate-resilient design parameters incorporated	✓	✓	
Construction	Dust emissions	Water sprinkling;	Contractor	Camp, drains,	Monthly	PM10	✓	✓	

Activities	Environmental / Social Impact	Mitigation Measures	Implementing Entity	Monitoring Location	Monitoring Frequency / Duration	Monitoring Parameter (for compliant action)	CSC	PIU	M&E C
activities and material transport	and exhaust pollution	cover materials; maintain machinery; provide masks; prohibit open burning.		irrigation channels		concentration $\leq 150 \mu\text{g}/\text{m}^3$ (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	✓	✓	
Construction camps and works near water bodies	Surface and groundwater contamination	Community consultations, access/crossing notices, water/drainage-user engagement, grievance redress and follow-up with nearby settlements.	Contractor	Camp, disposal sites	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	No uncontrolled dumping; disposal records	✓	✓	✓
Camp establishment and access routes	Loss of vegetation; dust on crops	Limit vegetation clearance; dust suppression; crop protection; compensatory	Contractor	Camps, access routes	Monthly	Area of vegetation cleared (m^2) per approved design;	✓	✓	

Activities	Environmental / Social Impact	Mitigation Measures	Implementing Entity	Monitoring Location	Monitoring Frequency / Duration	Monitoring Parameter (for compliant action)	CSC	PIU	M&E C
		plantation with communities.				compensatory plantation ratio 5:1			
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	PPE compliance; training records; no child labor	✓	✓	✓
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	Monitoring of environmental quality (air, water, noise), sediment/spoil testing where required, and post-rainfall embankment/drainage inspections.	Contractor	Haul routes, work sites, settlements	Daily during construction	Approved TCSMP implemented; no serious incidents	✓	✓	✓
Temporary access restriction	Livelihood disruption; vulnerable groups affected	Social and environmental impact monitoring, including access/crossing checks, water/drainage complaints, community safety,	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
		women/vulnerable groups and consultation/FGD records.							
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	✓	✓	✓
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 7-4: ESMP Implementation 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	-	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	-	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	6 quarters	-	330,000

Sr. No.	Component	Description / Cost Basis	Qty	Unit Rate	Estimated Cost PKR
		travel and communication			
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
		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	-	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	-	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. 12,000/visit	72 visits	12,000	864,000
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			1,638,000
6	Contingency	For emergency incidents, loud speakers, water gauges, additional mitigation, spill response, additional consultations and unforeseen ESMP requirements; 5% of subtotal	5%	-	238,460

Sr. No.	Component	Description / Cost Basis	Qty	Unit Rate	Estimated Cost PKR
		Total ESMP Budget — 18 Months			5,007,660

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.

Table 7-5: Details of Training Framework/ Capacity Building for the Proposed Project.

Sr. No.	Key Areas	Key Aspects to Cover	Potential Participants	Frequency of Training	Responsibility
1.	E&S Orientation / Awareness	E&S awareness; WB Environmental and Social Standards (ESSs); OHS and CHS aspects; Local E&S Legal requirements ESMF findings; Checklist /ESMP and its components; and GBV and GRM. Reporting on incidents and accidents and emergency preparation and response, preparedness Labor Management Procedures Resettlement and Land Acquisition.	IFRAP Project staff including Implementing Partners	At the start of the project; and Refresher afterwards as and when required. /bi-annual basis	Environmental, Social & Gender Specialists of IFRAP
2.	GBV/SEA/SH	Prevention of GBV/SEA/SH GRM for GBV/SEA/SH	IFRAP Project staff including Implementing Partners	At the start of the project; and Refresher afterwards as and when required/ bi-annual.	Social & Gender Specialists of IFRAP
3.	ESMF/ESMP Implementation	ESMF components; Key steps for the implementation of ESMF; Checklists used in the field; GRM & GBV; Checklist /ESMP implementation; and Documentation and reporting	IFRAP Project staff including Implementing Partners	At the start of the project; and Refresher afterwards as and when required/ bi-annual	Environmental, Social & Gender Specialists of IFRAP
4.	E&S Management	E&S mitigation plans; Stakeholder mapping and engagement OHS and CHS aspects Sensitize and	IFRAP Project staff including Implementing Partners staff /Masons' community	At the start of the project; and On-going/informal	Environmental, Social & Gender Specialists of IFRAP Gender FP (Implementing

Sr. No.	Key Areas	Key Aspects to Cover	Potential Participants	Frequency of Training	Responsibility
		aware project women beneficiaries on financial assistance for cash grants and the construction of multi hazard resilient houses Sensitization and awareness of women beneficiaries on GRM and for potential disasters Emergency Prevention, preparedness and response planning Resource Efficiency and Pollution Prevention and Management.	groups/ women beneficiary		Partners)

The major construction activities have been mentioned in the following table:

Table 7-6: Construction Activities

(i)	Masonry	(vii)	OSHA safety requirements
(ii)	Electrical	(viii)	Reading and interpreting drawings
(iii)	Framing	(ix)	Erecting
(iv)	Concrete	(x)	Crane and Rigging
(v)	Excavation	(xi)	Operation of Construction equipment
(vi)	Environmental codes	(xii)	Use of Power tools

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 and Community Access Management Plan, Emergency Response/Flood Preparedness Plan, Community Health and Safety Plan, Labor Management Plan, Camp Management Plan, Security Management Procedure, Sediment Testing/Reuse/Disposal Protocol, Gender Action measures (as applicable), GRM arrangements and Chance Find Procedure. All contractor templates and procedures shall use Pakistan/Balochistan-relevant institutions, local languages and local risk terminology and shall not retain country-inappropriate references from other jurisdictions.

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

Security management requirements shall be implemented within the Contractor's C-ESMP/Security Management Plan where security personnel are engaged. The PIU/CSC shall verify before deployment that any private security company is duly licensed in Pakistan/Balochistan and has no known record of human-rights abuse or excessive use of force. Any public security support shall be documented through written coordination/arrangement and shall require compliance with national law, ESS4, respectful community interaction, proportional use of force and the project Code of Conduct.

The C-ESMP shall also include the sediment testing/material reuse and disposal protocol, community access and informal crossing arrangements, and water/drainage-conflict management measures described in Sections 6.5 and 7.5. The Contractor shall submit these sub-plans to CSC/PIU for review prior to mobilization and shall update them whenever site conditions or community feedback require revision.

8 REFERENCES

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

1. Bidding Documents (Akbar Minor, Jhal Magsi).
2. Engineering Drawings (Akbar Minor, Jhal Magsi).
3. The Balochistan Environmental Protection Act, 2012.
4. The Pakistan Environmental Protection Act, 1997.
5. The Balochistan Wildlife Protection, Preservation, Conservation and Management Act, 2014.
6. The International Union for Conservation of Nature (IUCN) Red List of Threatened Species.
7. Guidelines for Public Consultation, Pakistan Environmental Protection Agency (Pak-EPA).
8. 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 behaviour 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:

- a. Consent to security background check;
1. 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;
2. Not use language or behavior towards men, women or children/learners that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate;
3. Carry out his/her duties competently and diligently;
4. 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;
5. 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.
6. 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;
7. Treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children;
8. 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;
9. 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;
10. Not exchange money, employment, goods, or services for sex, with community members including sexual favors or other forms of humiliating, degrading or exploitative behavior;
11. Attend trainings related to HIV and AIDS, SAE/SH, occupational health and any other relevant courses on safety as requested by my employer;
12. 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;
13. 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.

14. Refrain from any form of theft for assets and facilities including from surrounding communities.
15. Remain in designated working area during working hours;
16. 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 working hours;
17. Follow prescribed environmental occupation health and safety standards;
18. 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	Quarterly	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 not to do	Throughout the project	Quarterly	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	Bi-Annually	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	Quarterly	All 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	Quarterly	All construction staff

S. No	List of Topics/Training	Contents	Timeline	Frequency	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	Quarterly	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/Bi annually	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/Bi annually	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	Start & Quarterly refreshers	All construction 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	Monthly	All staff

S. No	List of Topics/Training	Contents	Timeline	Frequency	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	Quarterly & 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 Diseases, Cultural sensitivities of the local population	- 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 - 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	Throughout the project	Quarterly	All staff/Community

S. No	List of Topics/Training	Contents	Timeline	Frequency	Staff
		- 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)			
14	Embankment crest/slope/toe/apron inspected after rainfall or high-flow event	Embankment crest/slope/toe/apron inspected after rainfall or high-flow event	Throughout the project	Quarterly	All staff/Community
15	Temporary access/crossings or alternative routes maintained where community routes are affected	Temporary access/crossings or alternative routes maintained where community routes are affected	Throughout the project	Quarterly	All staff/Community
16	Sediment/soil visually screened and suspect material tested before reuse/disposal	Sediment/soil visually screened and suspect material tested before reuse/disposal	Throughout the project	Quarterly	All staff/Community
17	Security personnel, if deployed, licensed/vetted, CoC-signed and trained	Security personnel, if deployed, licensed/vetted, CoC-signed and trained	Throughout the project	Monthly	All staff/Community
18	Water/drainage/access complaints logged and resolved within GRM timeframe	Water/drainage/access complaints logged and resolved within GRM timeframe	Throughout the project	Monthly	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 waste water 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	Install temporary sediment basins, where appropriate, to capture sediment-laden runoff from the site. Divert runoff from undisturbed areas around the construction site

	may be deteriorated due to construction activities in the river, 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.	Stockpile materials away from drainage lines Prevent all solid and liquid wastes entering waterways by collecting solid waste, oils, chemicals, Bhitumen spray waste and 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 wastes.
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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

Activity	Environmental Impact	Environmental Management Guideline
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

		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, where 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

ECOP for Noise & Vibration

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 Consultant 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: <u>Avi-Fauna</u> • Greter Spotted Eagle (<i>Aquila clanga</i>)-April and May • Houbara Bustard (<i>Chlamydotis undulata</i>)-March & October • Black-tailed Godwit (<i>Limosa limosa</i>)-March to August <u>Reptiles</u> • Bengal Monitor (<i>Varanus bengalensis</i>)-June to September • Tortoise Afghan (<i>Testudo horsfieldii</i>)-May or June <u>Mammals</u> • Common Hill fox (<i>Vulpes vulpes</i>)- December or February • Chinkara (<i>Gazella bennetti</i>-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 i) biophysical health risk factors, (e.g. noise, dust, chemicals, construction material, solid waste, wastewater, vector transmitted diseases, etc), ii) risk factors resulting from human behavior (e.g. STD, HIV, etc) and	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

	(iii) Road accidents from construction traffic.	commencement of civil works and establishment of construction camps so as to maintain effective surveillance over public health, social and security matters. The Contractor shall follow the ECoPs presented in the following tables to reduce health risks to the construction workers and nearby community
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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 Consultant 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 problems and fire hazards	Provide appropriate security personnel (police /home guard or private security guards) and enclosures to prevent unauthorized entry into the camp area.
		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.
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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

Summary of non-compliances

This section summary the findings of the Environmental Management Plan (ESMP) compliance monitoring completed 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
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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



GRES-JV-SES



Reference No: GRES-SES-JV/IFRAP/35

Date: 15th November, 2025

FOR INTEGRATED FLOOD RESILIENCE AND ADPATION DEVELOPMENT 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 November 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 of Damages to Escape Channel & Akbar Minor along with structures District Jhal Magsi	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: _____



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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	Akbar Minor and Escape Channels Restoration Scheme	PKG-VI – Jhal Magsi District:	Escape Channels and Structures	Sediment inflow, erosion, disposal of silt	Temporary land use for construction, community safety	Design silt trap, use borrow area rehabilitation plan, safety signage	Moderate
				Culvert 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	Moderate
				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/NOV/25/2944/3834-A Date: 16-NOV-2025

Description:

Job Location:	JHAL MAGSI	Testing Instrument	24 Hours Air Monitoring Station
Job Performed By:	Mr. Mohsin	Job Date :	05-11-2025 to 06-11-2025
Monitoring Duration:	(10:00 AM To 09:00 AM) 24 Hrs.		
Project:	Integrated Flood Resilience and Adaption Project (IFRAP)		
Site Location:	Restoration of Damages to Escape Channel & Akbar Minor along with structures District Jhal Magi (Package -VI)		
Client Name :	CAMEOS CONSULTANT, QUETTA OFFICE		

Air Quality Test Report

Parameters	Temp	NO	NO ₂	SO ₂	CO	PM _{2.5}	PM ₁₀	SPM	O ₃
NEQS & BEQS Limit	-	24 hrs. (40 µg/m ³)	24 hrs. (80 µg/m ³)	24 hrs. (120 µg/m ³)	08 hrs. (5 mg/m ³)	24 hrs. (35 µg/m ³)	24 hrs. (150 µg/m ³)	24 hrs. (500 µg/m ³)	01 hr. (130 µg/m ³)
WHO Limit	-	-	24 hrs. (25 µg/m ³)	24 hrs. (40 µg/m ³)	08 hrs. (4 mg/m ³)	24 hrs. (15 µg/m ³)	24 hrs. (45 µg/m ³)	-	Peak Season (60 µg/m ³)

Time	Temp	NO	NO ₂	SO ₂	CO	PM _{2.5}	PM ₁₀	SPM	O ₃
10:00AM	33°C	19.8	39.2	7.8	0.0451	31.2	83.3	114.5	05
11:00AM	33°C	13.2	30.5	7.2	0.0451	25.5	81.5	107.0	-
12:00PM	35°C	18.9	38.1	9.3	0.0451	27.4	98.6	126.0	-
01:00PM	35°C	21.1	41.5	8.5	0.048	28.9	91.4	120.3	-
02:00PM	35°C	14.6	37.8	9.1	0.048	24.1	94.7	118.8	-
03:00PM	35°C	20.2	40.2	4.5	0.048	26.3	95.5	122.0	-
04:00PM	36°C	15.3	43.5	8.7	0.062	21.2	105.0	126.2	-
05:00PM	36°C	19.9	36.0	9.0	0.062	24.4	101.2	125.6	-
06:00PM	34°C	11.5	40.9	8.3	0.044	28.2	97.5	125.7	-
07:00PM	34°C	16.3	32.4	3.8	0.044	23.2	92.3	115.5	-
08:00PM	33°C	11.1	33.2	8.1	0.044	30.0	97.4	127.4	-
09:00PM	31°C	12.4	28.5	7.9	0.039	21.5	86.2	107.7	-
10:00PM	30°C	14.3	34.0	3.1	0.039	30.8	88.0	118.8	-
11:00PM	29°C	7.4	26.3	5.9	0.039	26.1	79.6	105.7	-
12:00AM	29°C	11.2	26.7	6.0	0.028	28.0	82.0	110.0	-
01:00AM	29°C	8.7	22.4	1.9	0.028	21.0	74.5	95.5	-
02:00AM	28°C	6.3	21.1	1.2	0.028	19.5	71.1	90.6	-
03:00AM	27°C	9.2	28.9	4.8	0.029	28.4	69.5	97.9	-
04:00AM	28°C	8.4	19.9	0.9	0.029	29.3	66.0	95.3	-
05:00AM	26°C	5.6	26.1	5.2	0.029	22.5	58.3	80.8	-
06:00AM	27°C	9.7	21.3	0.7	0.037	31.5	63.5	95.0	-
07:00AM	28°C	7.5	20.0	3.7	0.037	25.2	56.4	81.6	-
08:00AM	29°C	14.8	27.0	5.8	0.037	30.1	65.1	95.2	-
09:00AM	31°C	11.9	28.8	2.4	0.037	28.5	68.0	96.5	-
AVERAGE	30.7°C	12.99	31.99	5.91	0.0435	26.81	79.76	108.65	05







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Sustainable Environmental Services | SES

Analysis Report

Ref # SES/Env/NOV/25/2944/3834-B

Date: 16-NOV-2025

Description:

Job Location:	JHAL MAGSI	Testing Instrument	24 Hours Air Monitoring Station
Job Performed By:	Mr. Mohsin	Job Date :	05-11-2025 to 06-11-2025
Monitoring Duration:	(10:00 AM To 09:00 AM) 24 Hrs.		
Project:	Integrated Flood Resilience And Adaption Project (IFRAP)		
Site Location:	Restoration of Damages to Escape Channel & Akbar Minor along with structures District Jhal Magsi(Package -VI)		
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/m ³	-	40 (24 hrs.)	12.99	WL
2.	Oxide Of Nitrogen as (NO ₂)	µg/m ³	25(24 hrs.)	80 (24 hrs.)	31.99	WL
3.	Sulphur Dioxide (SO ₂)	µg/m ³	40(24 hrs.)	120 (24 hrs.)	5.91	WL
4.	Carbon Monoxide (CO)	mg/m ³	4(24 hrs.)	5 (08 hrs.)	0.0435	WL
5.	Particulate Matter (PM 2.5)	µg/m ³	15(24 hrs.)	35 (24 hrs.)	26.81	WL
6.	Particulate Matter (PM 10)	µg/m ³	45(24 hrs.)	150 (24 hrs.)	79.76	WL
7.	SPM	µg/m ³	-	500 (24 hrs.)	108.65	WL
8.	Ozone (O ₃)	µg/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:

Kashif Ahmed



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Sustainable Environmental Services | SES

Analysis Report

Ref # SES/Env/NOV/25/2944/3834-C

Date: 16-NOV-2025

Description:

Job Location:	JHAL MAGSI	Testing Instrument:	Noise Meter
Job Performed By:	Mr. Mohsin	Job Location :	05-11-2025 to 06-11-2025
Monitoring Duration:	(10:00 AM To 09:00 AM) 24 Hrs.		
Project:	Integrated Flood Resilience And Adaption Project (IFRAP)		
Site Location:	Restoration of Damages to Escape Channel & Akbar Minor along with structures District Jhal Magsi(Package -VI)		
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	38.71
02					11:00AM	37.18
03					12:00PM	38.37
04					01:00PM	40.00
05					02:00PM	36.17
06					03:00PM	38.03
07					04:00PM	35.54
08					05:00PM	39.38
09					06:00PM	37.10
10					07:00PM	38.07
11					08:00PM	36.59
12					09:00PM	34.56
13			55 dB(A) (Night time)	65 dB(A) (Night time)	10:00PM	37.39
14					11:00PM	32.62
15					12:00AM	30.42
16					01:00AM	33.00
17					02:00AM	34.14
18					03:00AM	32.32
19					04:00AM	34.90
20					05:00AM	30.00
21					06:00AM	33.93
22			65 dB(A) (Day time)	75 dB(A) (Day time)	07:00AM	32.32
23					08:00AM	35.28
24					09:00AM	36.30
Average Result					35.51	

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 results.
This report is not valid for Court evidence/Judicial purposes.
The measurement results based on the time of measurement.

WL= Within Limit

Field Analyst:

Mr. Mohsin

Chief Chemist:



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Sustainable Environmental Services

SES

Analysis Report

Ref # SES/Env/NOV/25/2944/3834-D

Date: 16-NOV-2025

Description:

Quantity of sample	1.0 Liter	Sampling Methodology	Grab	Job Date	06-11-2025
Analysis Type	Chemical Analysis		Sampling Location	Project Site	
Project:	Integrated Flood Resilience And Adaption t Project (IFRAP)				
Site Location:	Restoration of Damages to Escape Channel & Akbar Minor along with structures District Jhal Magsi (Package -VI)				
Client Name :	CAMEOS CONSULTANT, QUETTA OFFICE				

Surface Water Report

S #	Parameters	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Result	Remarks
01	Turbidity	NTU	HACH Turbidity meter	<5	<15	<15	< 0.09	WL
02	Taste		Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Saline	WL
03	Odour		Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-obj	WL
04	Colour	TCU	Pt-Co method	≤ 15 TCU	≤ 15 TCU	≤ 15 TCU	< 4	WL
05	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	-	-	-	ND	WL
06	Residual chlorine	Cl ₂ (mg/L)	HACH Method 8167	0.2-0.5	-	0.2-0.5	0.9	OL
07	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
08	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	< 1000	< 1000	< 1000	1106	OL
09	Total Hardness	As COCO ₃ (mg/L)	APHA 2340-C	< 500	-	< 500	392	WL
10	Fluoride	F ⁻¹ (mg/L)	APHA 4500-F ⁻¹	≤ 1.5	1.5	≤ 1.5	0.9	WL
11	Chloride	Cl ⁻¹ (mg/L)	APHA 4500-Cl ⁻¹	< 250	250	< 250	261	OL
12	Cyanide	CN ⁻¹ (mg/L)	HACH Method 8027	≤ 0.05	0.07	≤ 0.05	ND	WL
13	Nitrate	NO ₃ ⁻¹ (mg/L)	HACH Method 8192	≤ 50	50	≤ 50	0.31	WL
14	Nitrite	NO ₂ ⁻¹ (mg/L)	APHA 4500-NO ₂ ⁻¹ -B	≤ 3.0(P)	3	≤ 3.0(P)	0.05	WL
15	Antimony	Sb (mg/L)	ASTM D-3697	≤ 0.005	0.02	≤ 0.005	ND	WL
16	Aluminium	Al(mg/L)	ASTM D-857	≤ 0.2	0.2	≤ 0.2	0.11	WL
17	Arsenic	As (mg/L)	ASTM D-2972	≤ 0.05	0.01	≤ 0.05	ND	WL
18	Boron	B (mg/L)	ASTM D-3082	0.3	0.3	0.3	ND	WL
19	Barium	Ba(mg/L)	ASTM D-4382	0.7	0.7	0.7	0.008	WL
20	Chromium Total	Cr(mg/L)	ASTM D-1687	≤ 0.05	0.05	≤ 0.05	ND	WL
21	Copper	Cu (mg/L)	ASTM D-1688	2	2	2	<0.08	WL
22	Cadmium	Cd(mg/L)	ASTM D-3557	0.01	0.003	0.01	ND	WL
23	Lead	Pb(mg/L)	ASTM D-3559	≤ 0.05	0.01	≤ 0.05	ND	WL
24	Manganese	Mn(mg/L)	ASTM D-858	≤ 0.5	0.5	≤ 0.5	ND	WL
25	Mercury	Hg (mg/L)	ASTM D-3223	≤ 0.001	0.001	≤ 0.001	ND	WL
26	Nickel	Ni(mg/L)	ASTM D-3866	≤ 0.02	0.02	≤ 0.05	ND	WL
27	Selenium	Se(mg/L)	ASTM D-3858	0.01	0.01	0.01	ND	WL
28	Zinc	Zn (mg/L)	ASTM D-1691	5	3	5	0.15	WL

Note:

BEQS-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 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:



New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
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Sustainable Environmental Services SES

Analysis Report

Ref # SES/Env/NOV/25/2944/3834- E

Date: 16-NOV-2025

Description:

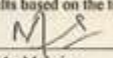
Quantity of sample	1.0 Liter	Sampling Methodology	Grab	Sampling Date	06-11-2025
Analysis Type	Chemical Analysis			Sampling Location	Project Site
Project	Integrated Flood Resilience And Adaption Project (IFRAP)				
Site Location:	Restoration of Damages to Escape Channel & Akbar Minor along with structures District Jhal Magi (Package -VI)				
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	7.14
3	Biological Oxygen Demand	BOD ₅ (mg/L)	APHA 5210	80	80	80	69.2
4	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	150	150	150.3
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.G (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 ⁻²	1.0	1.0	1.0	0.30
14	Ammonia	NH ₃ (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-D3559	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	Fe ⁺² (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)	Pfaltest Kit	1.0	1.0	1.0	ND
28	Copper	Cu ⁺² (mg/L)	HACH Bisquinoline Method	1.0	1.0	1.0	0.04
29	Chlorine	Cl ₂ (mg/L)	HACH DPD Method	1.0	1.0	1.0	ND
30	Aluminum	Al (mg/L)	HACH Erichrome Cyanine R	1.0	1.0	1.0	ND
31	Total Kjeldahl Nitrogen	(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 duly 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

Field Analyst: 

Mr. Mohsin

Chief Chemist: 

Kashif Ahmed



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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-	• 40% women in DRMCs. • of personnel trained (gender-disaggregated). • of women-form groups and engaged in activities.	• 40% women representation. • 100% CSC staff and contractors trained.	PIU, CSC Gender/Social Specialist	Throughout project

Strategic Area	Activities	Indicators	Targets	Responsibility	Timeline
	sensitivity, SEA/SH, and safeguards sessions to community • Engage local women's organizations for community outreach. • Provide gender-sensitivity, SEA/SH, and safeguards sessions to CSC and contractor staff				
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.	Rehabilitation/restoration of Akbar Minor damaged structures, including earthen embankment strengthening, compaction, stone pitching, geotextile, gabion/apron toe protection, erosion/scour control, access management and site restoration.	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.	Mula/Kachhi plain seasonal floodplain setting with flood-prone FPB alignment, local access tracks and	40% women participation. - Monthly and Quarterly awareness	PIU, CSC Social and Gender team	Throughout project

Strategic Area	Activities	Indicators	Targets	Responsibility	Timeline
	•Conduct GRM awareness sessions, including women-only sessions.	agricultural land; no notified protected area, wetland or critical habitat within the works footprint.	sessions conducted.		
Monitoring and Reporting	- Monthly ESMP Monitoring Reports - Quarterly Social Safeguards Reports - GAP Progress Reports - GRM records and community feedback	No critical habitat or protected biodiversity feature in the footprint; common shrubs/bushes and agricultural vegetation may be affected and shall be avoided/minimized and compensated/restored where required.	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

Annex: 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 meeting timings 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	☐ Yes ☐ No	

	facilities?		
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 SummaryOverall Compliance Rating: ☐ Good ☐ Moderate ☐ Poor**Verification**

Name: _____

Designation: _____

Organization: _____

Signature: _____

Date: _____

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.

ANNEXURE: K

ENVIRONMENTAL AND SOCIAL SCREENING CHECKLIST (B)

Component 1: Community Infrastructure Rehabilitation

A	General Information	
1	Subproject Location	District: Jhal Magsi
2	Package	Package -6
3	Subproject Activities	Restoration of Damages to Escape Channel & Akbar Minor along Structure
4	Proposed Date of Commencement of Work	
5	Important geographic / topographic feature (if any)	N/A
6	Important biological feature (if any)	Important biological feature observed.
7	Sensitive Receptors within 200 m	None within 200m

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	✓				shrubs & bushes
2	Will the subproject require the setting up of ancillary facilities?	Yes		✓			Facilities (camps, storage) to be located away from sensitive receptors ensure sanitation, drainage, and waste management.
3	Will the subproject require a large amount of raw or construction materials, energy and/or water?	Yes		✓			Mud / Stone
4	Will the subproject generate large amounts of residual wastes, construction material waste?	No	✓				Limited construction waste, dismantled concrete/debris, spoil and camp waste are expected and shall be segregated, reused where suitable, and disposed of at approved locations.
5	Is the sub-project expected to result in soil erosion?	Yes		✓			Excavation, approach reconstruction and channel works may cause localized erosion/sedimentation. Phased excavation, slope stabilization, erosion control and site restoration shall be implemented.
6	Is the sub project expected to create borrow pits for construction material?	Yes		✓			Yes, (reference Section 3.)

7	Will the subproject result in potential soil or water contamination (e.g., from oil, grease and fuel from equipment yards)?	Yes		✓			Yes, (reference Section 6)
8	Will the subproject involve the storage, handling, or transport of hazardous substances?	Yes	✓				Limited quantities of fuel, lubricants, curing compounds and construction chemicals may be handled. Storage shall be banded, labeled and managed under the Waste Management and Emergency Response Plans.
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		✓			Dust and exhaust emissions may occur from excavation, haulage and machinery. Water sprinkling, covered loads, speed control and equipment maintenance shall be implemented.
10	Will the subproject increase ambient noise levels?	Yes	✓				Temporary construction noise may occur from machinery and transport. Works shall be limited to daytime near receptors, equipment maintained and noise monitored where required.
11	Are there any protected areas on or around the locations which could be affected by the subproject?	No					No protected areas nearby.
12	Will there be any adverse impact on the flora due to subproject activities?	Yes	✓				Only limited shrubs/bushes within the work footprint may be cleared. Avoidance, minimization and compensatory plantation measures shall be implemented where applicable.
13	Will there be any adverse impact on the fauna due to subproject activities?	Yes	✓				Temporary disturbance to common fauna may occur due to noise and movement. No protected habitat is present; work areas shall be limited and hunting/wildlife disturbance prohibited.

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 minimal risk of outside influx.
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)?	Yes	✓				Limited risk of worker-community interaction exists. Local hiring, Code of Conduct, labour influx management, community liaison and GRM shall be implemented.
3	Will the activities supported by the project anticipate the occurrence of child labor, forced labor, or bonded labor?	No					Project activities will not involve child, forced, or bonded labor
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 in the immediate vicinity
5	Will the sub project pose occupational health and safety risks?	Yes		✓			OHS risks exist due to excavation, dismantling, RCC works, machinery operation, work near water and traffic. Contractor shall implement OHSP, PPE, toolbox talks, barricading, first aid and incident reporting.
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.	Yes	✓				Temporary increase in construction traffic may affect local movement. Traffic Management Plan, speed limits, warning signage, flag persons and community notification shall be implemented.
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					Land acquisition process to follow legal procedures documentation and fair compensation required
9	Will there be a loss of shelter and residential land due to the land acquisition or clearance of the existing site?	No					No residential land or shelter will be affected
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					
12	Will there be a loss of agricultural land, crops, trees, and fixed assets due to land acquisition?	No					Only shrubs and bushes may be cleared.
13	Will people lose access to natural resources, communal facilities and services due to involuntary land use restrictions or access to legally designate parks/protected areas?	No					No loss of access to natural resources
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	✓				No land acquisition or physical/economic displacement is anticipated. Vulnerable groups such as women, elderly persons, persons with disabilities, tenants/landless labourers and poor households shall be consulted and prioritized for access/restoration support where needed.
15	Have there been any past security-related issues at the subproject site?	No					No security related issues.
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 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 and Annexure-R)
18	Will there be any impact on women that may hinder their mobility during reconstruction and rehabilitation activities?	No					Women's mobility will not be hindered during 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

COMMUNITY CONSULTATIONS MEETING AT AKBAR MINOR

مشاورتی اجلاس

تاریخ: 20-09-2020 کا مقام: جھل مگسی وقت: 1:00 تا 3:00

آیجنڈا:-

- 1: جھل مگسی (Akbar Minor) کینال کے حوالے سے بریفنگ
- 2: موجودہ حوالیاتی اور بحالی (Rehabilitation) کے کام کی تفصیل پیش کرنا
- 3: حوالیاتی و سمرانی اشارے (Es) اور حفاظتی اقدامات کی دلچسپی
- 4: کمیونٹی کے مسائل خدشات اور تجاویز سنا + یقین دہانی
- 5: تفصیل:

اجلاس کا آغاز ملاکھان سے ہوا۔ اس کے بعد (IFRAP) ٹیم نے شرکاء کو خوش آمدید کہا گیا۔ اور (IFRAP) کے تحت اجلاس کا مقاصد بیان کیے۔

سرکار کو بتایا گیا کہ مہر و جگٹ کا مقصد (Akbar Minor) کینال ڈسٹرکٹ جھل مگسی کی بحالی و صفائی پانی کی بیاؤں میں بہتری کمیونٹی کے خدشات کا حل اور دیگر باذریعی فائدہ کرنا ہے۔

کینال کے متعدد مقامات پر سلٹ جمع ہو چکی ہے۔ کناروں کی کٹائی (Erosion) کچھ حصوں میں گرائنگ، لیکج اور شدید Damage پانی کے بیاؤں میں غیر ضروری رکاوٹیں صفائی، 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 تاکہ مزاحمتی ہو سکے۔

کیمپوٹی کی پیشگی اطلاع دے دی جائے گی۔ تمام
ورلڈ بینک کے ماحولاتی و سماجی اصولوں کے تحت ان زمین
کی صفائی، تو سیج، عرصہ، اور بنیادی مشاغل میں۔
تمام کے دوران مشینری اور سامان کے لئے برقی مواد سے آگاہ کیا گیا۔

آخر میں کیمپوٹی کا شکریہ ادا کیا گیا کہ انہوں نے وقت
نکالا اور اپنی قیمتی رائے دی۔
نسریم کو یقین دلایا گیا کہ ان کی تجاویز کو
(ESMP) اور محلی ماکہ دونوں میں شامل کیا جائے گا۔

اجلاس دیئے گئے، کلمان کے ساتھ غنیمت ہو۔

تصدیق کنندہ:

۱: ایل جی آر سی ممبر کسان انجن: نام: صبر عارف مہار، دستخط: عارف

۲: ایل جی آر سی ممبر کسان انجن: نام: رحمت سہیل، دستخط: رحمت

۳: کمیٹی ممبر

۱: نام: شمس بنگلہ، دستخط: شمس

- ۱: نام: حسن مگسی دستخط: حسن مگسی
- ۲: نام: حسین مگسی دستخط: حسین مگسی
- ۳: نام: محرم سرپرده دستخط: محرم سرپرده
- ۵: نام: اشرف اشرفی دستخط: اشرف
- ۶: نام: منصور مگسی دستخط: منصور
- ۷: نام: نادر بنگلانی دستخط: نادر
- ۸: پروجیکٹ شاف:
- ۹: نام: محمد شعیب کمان سول انجمن دستخط: محمد شعیب کمان
- ۱۰: نام: صبر زور رودینی Social Organizer دستخط: صبر زور رودینی
- ۱۱: نام: احسان اللہ Geologist دستخط: احسان اللہ
- ۱۲: نام: دستخط:
- ۱۳: نام: دستخط:
- ۱۴: نام: دستخط:
- ۱۵: نام: دستخط:
- ۱۶: نام: دستخط:

ANNEXURE: M

**LIST OF PARTICIPANTS IN CONSULTATIVE MEETING WITH DISTRICT
ADMINISTRATION**

S. No.	Name	Department / Organization	Designation
1	Syed Rehmatullah	District Administration	Deputy Commissioner, Jhal Magsi
2	Abdul Majeed Muhammad Hossani	District Administration	Assistant Commissioner
3	Farukh Khokar	Irrigation Department	Sub-Divisional Officer (SDO) Irrigation
4	Khalil Mengal	Agriculture Department	Agriculture Officer
5	Shakoor Kakar	CAMEOS Architects & Consultants	Social Safeguard Specialist
6	Naqeeb Ullah Kakar	CAMEOS Architects & Consultants	Social Safeguard Specialist
7	Sidra	CAMEOS Architects & Consultants	Gender Specialist
8	Mir Zarak	CAMEOS Architects & Consultants	Social Organizer
9	Mili Khan	CAMEOS Architects & Consultants	Junior Environmental Specialist

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: - Exercising constraint and caution and understand how force may be used - Respecting human rights - Behaving consistently - Knowing and abiding by applicable laws - 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

The Contractor for Package-VI shall prepare and implement a site-specific Camp Management Plan as part of the Contractor's Environmental and Social Management Plan (C-ESMP). The plan shall define mitigation measures to avoid or reduce camp-related impacts during rehabilitation of the Escape Channel and Akbar Khan Minor structures, including sanitation, worker accommodation, potable water, waste management, community interface, worker conduct and restoration of camp areas after demobilization.

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 (Urdu and locally understood Balochi/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: *Preventing overcrowding on site by following govt. established regulations on social distancing *Provide wash hand basins for proper and thorough 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	

Project Activity	Potential Impact	Proposed Mitigation Measures/ Actions	Responsibility for mitigation
		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
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	Contractor / CSC / PIU-Irrigation Department 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, plastic bottles, food packaging and other general	Contractor/ Engineering Consultant Environmental

Project Activity	Potential Impact	Proposed Mitigation Measures/ Actions	Responsibility for mitigation
		domestic waste. 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. Ensure regular toolbox meetings are held among contractor workers to offer awareness on transmission of contagious or communicable diseases.	Safeguards Specialist
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 (Urdu and locally understood Balochi/Sindhi 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

Project Activity	Potential Impact	Proposed Mitigation Measures/ Actions	Responsibility for mitigation
culverts, drainage basins Construction	Occupational accidents and injuries to workers and risk to community health and safety Erosion Risk of erosion and flood	• 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 • 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	Contractor
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; District Health Office / Health Department, Government of Balochistan, where required
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 (Urdu and locally understood Balochi/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

Project Activity	Potential Impact	Proposed Mitigation Measures/ Actions	Responsibility for mitigation
		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

S. Nr	Actions
	to forestall any likely re-occurrences, where possible
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.

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):-----

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/Site Office	Generation of sanitary waste	Ensure provision of sanitary facilities on site for workers and enforce usage. Ensure usage of approved municipal/local waste management authority or BEPA-authorized waste vendor 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 bunded 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, plastic bottles, food packaging and other general domestic waste. 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.	
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 municipal/local disposal site or BEPA-authorized 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
Completion and demobilization of rehabilitation works	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:

Security arrangements for Package-VI shall be proportionate to site risks and shall comply with ESS4 and national law. If a private security company is hired, PIU shall verify that the company is duly licensed and has no known record of human-rights abuses or excessive use of force. Any arrangement with public security shall be documented through an appropriate written arrangement/MoU and shall emphasize respect for human rights, avoidance of excessive force, non-discrimination, and compliance with applicable law.

All security personnel deployed in relation to the subproject, whether public or private, shall sign and comply with a Code of Conduct prohibiting harassment, intimidation, discrimination, excessive use of force and any form of SEA/SH. Security personnel shall receive training on the Code of Conduct, community interaction, proportional use of force, grievance referral, GBV/SEA/SH prevention and emergency response before deployment and periodically during construction.

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 developing a specific step-by-step approach to security response;
- Establish a site security response team to respond to project-relevant hazards, including unauthorized access, theft or vandalism, local disputes, traffic-related conflict, flood/emergency evacuation and other law-and-order incidents relevant to District Jhal Magsi.
- 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 coordination with the District Administration, local police/Levies, Irrigation Department field staff, health facilities and other relevant emergency response agencies, as required.

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:
- Potential or actual workplace violence, harassment, intimidation or community-worker conflict
- Domestic violence occurring within our facilities

- General evacuation requirements due to a technical, human or natural threat
- Other site-specific threats determined by the Contractor's Project Manager, Security Focal Person, CSC or PIU.

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

Training and exercises for implementing this Security Management Plan shall include briefings, toolbox talks, tabletop exercises and practical drills covering site access control, respectful community interaction, emergency evacuation, flood alerts, incident reporting, GBV/SEA/SH prevention, Code of Conduct compliance and coordination with local police/Levies and district authorities where required.

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 National Institute of Health (NIH) Pakistan, the Provincial Disaster Management Authority (PDMA) Balochistan, and the District Health Officer (DHO) Jaffarabad 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 ENGAGEMENT 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	Project Implementation Unit / Executing Agency, Supervision Consultant,

Category	Stakeholders / Workers
stakeholders	Contractor, subcontractors, suppliers and service providers.
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.

Method	Purpose
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

Project Stage	Stakeholders / Workers	Method	Key Topics	Frequency / Timing	Responsibility
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
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 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					
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 VIEW OF COMMUNITY CONSULTATION



ANNEXURE: Y

WORKPLAN / IMPLEMENTATION SCHEDULE

