ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

PROJECT IMPLEMENTATION UNIT (PIU-ID)

BALOCHISTAN WATER SECURITY AND PRODUCTIVITY IMPROVEMENT PROJECT (BWSPIP) IN KACHHI PLAIN

FLOOD DISPERSAL / WEIR AND ALLIED STRUCTURES AT JALAL KHAN IN NARI RIVER BASIN

APRIL 19, 2026








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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
BWSPIP	Balochistan Water Security and Productivity Improvement Project
BOQs	Bill of Quantities
PDSC	Project Design and 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
FD/W	Flood Dispersal/Weir
WB-ESSs	World Bank Environmental and Social Standards
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

EXECUTIVE SUMMARY

1. PROJECT BACKGROUND

The Balochistan Water Security and Productivity Improvement Project (BWSPIP) is a World Bank-financed initiative that addresses water security and climate resilience in Balochistan, one of Pakistan's most water-stressed provinces. The Kachhi Plain, where this subproject sits, gets as little as 8 centimeters of rain per year, and the 2022 monsoon floods wiped out irrigation systems, farmland, and homes across the district. BWSPIP responds through five coordinated investments: flood protection infrastructure, productive water use, watershed management, institutional strengthening, and water supply improvements. The Flood Dispersal/Weir and Allied Structures at Jalal Khan in the Nari River Basin is a priority subproject under Component 1, designed to protect approximately 2,745 people across 305 households and their spate-irrigated farmland from recurrent flash floods at the Bolan-Nari confluence.

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

This ESMP was prepared for the Jalal Khan subproject in compliance with the World Bank Environmental and Social Framework (ESF), the Relevant Environmental and Social Standards (ESS1–ESS10), the BWSPIP ESCP, ESMF, and relevant national and provincial laws. Its core purpose is to identify environmental and social risks, define proportionate mitigation measures, establish a monitoring and reporting framework, and set clear roles for the PIU, PDSC, and Contractor.

The ESMP also ensures compliance with legal and regulatory requirements at national and provincial levels, including the Balochistan Environmental Protection Act 2012, NEQS, Balochistan OSH Act 2022, and Relevant labor laws. It establishes capacity building requirements, compliance monitoring procedures, institutional and implementation arrangements, grievance redress mechanism, ESMP budget and disclosure obligations, including preparation of a non-technical summary in Urdu and Balochi for affected communities before civil works start.

3. LEGAL AND POLICY FRAMEWORK

The subproject operates within three layers of regulatory requirements. At the national level, the key instruments are the Pakistan Environmental Protection Act 1997, NEQS, and the National Environmental Policy 2005. At the provincial level, the Balochistan Environmental Protection Act 2012, Balochistan OSH Act 2022, the Balochistan Factories Act 2021, the Balochistan Wildlife Preservation, Protection, Conservation and Management Act 2014, and

the Balochistan Climate Change Policy 2024 are directly Relevant. At the international level, the World Bank ESF (ESS1 through ESS10) and World Bank Group General EHS Guidelines (April 2007) set the minimum standards. Where national or provincial requirements are less stringent than World Bank standards, the World Bank requirements apply.

4. ENVIRONMENTAL AND SOCIAL BASELINE

Physical Conditions:

The subproject area in the Kachhi Plain is hyper-arid, with annual rainfall of just 80–100 mm and summer temperatures reaching 48–52°C. The Nari, Talli, and Bolan rivers are dry most of the year but can exceed 5,000 m^3/s during monsoon events in July–August. Soils are alluvial silts with low organic content. Baseline monitoring (SES Laboratory, January 2026) confirmed ambient air and noise levels within NEQS limits. Surface water showed fecal coliform exceedances and groundwater showed Cadmium and Lead above permissible limits, both requiring mandatory construction-phase water protection controls by the Contractor.

Agriculture and Livelihoods:

Land use is dominated by sailaba (spate-irrigated) farming of wheat, oilseeds, and fodder, supplemented by livestock herding. The project area has approximately 305 households. Average seasonal earnings and farming expenditure per acre are detailed in Tables 4-31 and 4-32 of the main report. The subproject will directly and positively affect agricultural productivity, irrigation access, and WASH conditions across the command area.

Climate and Disaster Risks:

The area experienced two catastrophic flood events in 2010 and 2022 that destroyed crops and displaced communities. Climate projections (BCCP 2024; IPCC AR6) indicate 2–3°C warming by 2050 with more intense monsoon events and longer droughts, making this infrastructure investment critical to long-term food and water security.

Socio-Economic Context:

The affected population of approximately 2,745 people across four villages has limited access to education, health, safe water, and sanitation. Vulnerable groups include women with restricted land access, landless households, and the elderly. Detailed baseline social indicators are in Sections 4.5.10–4.5.19 of the main report.

5. IMPACT ASSESSMENT AND MITIGATION

Construction phase (18–24 months): Key environmental and social risks are summarized below, with detailed characterization in Chapter 6 and corresponding mitigation and monitoring measures in Table 1-2.

Impacts were assessed using an adapted Leopold Matrix approach, evaluating each project activity against environmental and social components. Significance was determined based on three criteria: institutional (regulatory standards), technical (expert judgment and scientific guidance), and public (community concerns from consultations). Each impact was characterized by its nature, magnitude, spatial extent, duration, and reversibility.

Impact Category	Significance	Primary Mitigation Measures (summary)
Air Quality / Dust	Medium adverse	Equipment maintenance, water sprinkling, traffic and speed control, siting of camps and generators away from settlements, monitoring against NEQS.
Noise & Vibration	Medium adverse	Working-hour restrictions, mufflers and acoustic enclosures, equipment maintenance, community notification, monitoring against NEQS.
Water Quality	Low–Medium adverse	Erosion and sediment control, fuel and chemical storage in bunded areas, designated washing/refueling areas, wastewater management, surface and groundwater monitoring.
Solid / Liquid Waste	Low–Medium adverse	Waste and Spoil Management Plan, segregation and proper disposal, hazardous waste handling, on-site sanitation and septic systems.
Occupational Safety	Medium adverse (if unmitigated)	OHS Plan, PPE, JSAs, training, first-aid and emergency response, heat-stress management, accident reporting.

Impact Category	Significance	Primary Mitigation Measures (summary)
Community Health & Safety	Low–Medium adverse	Traffic Management and Contractor's Health & Safety (CHS) Plans, site fencing, speed limits, access maintenance, community awareness, GRM.
Biodiversity / Vegetation / Fauna	Low–Medium adverse	Limiting clearance to RoW, topsoil conservation and restoration, riparian buffer maintenance, ban on hunting and fuelwood collection, borrow-area restoration.
Labor Conditions	Medium adverse (if unmitigated)	Implementation of BWSPIP LMP, fair employment conditions, prohibition of child/forced labor, worker GRM, Codes of Conduct and GBV/SEA/SH measures.

Operation phase (long-term):

Impact	Significance	Expected Outcome
Flood Protection	Major positive	Significant reduction in annual flood losses and livelihood disruption; protection of settlements and agricultural land.
Agricultural Productivity	Major positive	More predictable access to water; increased crop yields and food security in the command area.
Climate Resilience	Major positive	Enhanced resilience of communities to flood and climate variability through improved infrastructure and O&M.
Ecosystem Services	Minor negative (acceptable)	Reduced uncontrolled floodplain inundation and nutrient deposition; effects considered acceptable given flood-risk reduction benefits.

6. INSTITUTIONAL ARRANGEMENTS

Primary implementing agencies:

1. Project Implementation Unit (PIU) – overall ESMP coordination, environmental and social monitoring, and community engagement.
2. Contractor – daily ESMP implementation through the Contractor's ESMP (C-ESMP), including OHS, camp, traffic and waste management.
3. Project Design and Supervision Consultant (PDSC) – independent monitoring and compliance verification.
4. World Bank Task Team – ESF compliance oversight and adaptive management guidance.

ESMP staffing:

- PIU Environmental Specialist (full-time).

- PIU Social Specialist (full-time).
- PIU Gender Specialist (full-time).
- Contractor Community Liaison Officer (full-time).
- Contractor OHS Officer (full-time).
- Contractor Environmental Officer (full-time).
- Contractor HR Officer (full-time).
- PDSC Environmental and Social Specialist (full-time).

7. CAPACITY BUILDING, COMPLIANCE MONITORING, AND DISCLOSURE

The Contractor must complete induction training and Code of Conduct (CoC) signing for all workers before anyone accesses the construction site. Training covers OHS, GBV/SEA/SH prevention, environmental obligations, and GRM procedures. The PIU conducts compliance monitoring through monthly field inspections, quarterly environmental sampling by accredited labs, and semiannual ESMP performance reviews. The PDSC provides independent verification. All monitoring results will be reported to the World Bank quarterly. This ESMP will be disclosed upon after immediate approval from the bank e.g. within one week after approval on the PIU website and BWSPIP project portal. A non-technical summary in local languages particularly in Urdu, and if possible, Barhui or Balochi will also be finalized and shared with the affected communities in Rehanzai New, Rehanzai Kohna, Jamrah, and Jalal Khan before civil works start. The Udru translated summary will also be uploaded on project website during disclose of the Approved ESMP.

8. GRIEVANCE REDRESS MECHANISM (GRM)

The Grievance Redress Mechanism (GRM) for Component A of the Balochistan Water Security & Productivity Improvement Project (BWSPIP) is an established system to address complaints from communities, workers, and other stakeholders in a timely, transparent, and fair manner, in line with World Bank requirements. It builds on the earlier BIWRMDP model and is now operational under the PIU of the Irrigation Department with a defined institutional structure, including a Grievance Redress Committee (GRC), a Grievance Redressal Officer (GRO), and district-level Grievance Focal Persons (GFPs). Multiple grievance uptake channels such as hotline, SMS, WhatsApp, email, complaint boxes, and in-person submission have been enabled to ensure accessibility, including for vulnerable groups.

The GRM covers environmental, social, land, labor, health and safety, and sensitive issues such as GBV/SEA/SH under strict confidentiality protocols. A structured process is in place whereby grievances are recorded within 24 hours, acknowledged within 2 days, and resolved within 15–20 days, depending on their priority level. A tiered system ensures that minor issues are addressed locally while serious cases are escalated to higher authorities, with an appeal option available at the Project Steering Committee level.

Progress to date includes establishment of the GRM framework, deployment of institutional roles at PIU and district levels, activation of multiple submission channels, and nomination of

community-level focal persons to improve outreach. Initial awareness and accessibility measures, including provisions for women through female staff engagement, have also been initiated.

A **dedicated Worker GRM**, described in Section 7.6.5, will operate at site level under ESS2, providing all categories of workers with confidential, non-retaliatory channels to raise labor-related concerns, including OHS, wages, discrimination and GBV/SEA/SH.

For implementation of GRM activities under the Jalal Khan Irrigation Scheme (Package 1), a budget of **PKR 2,000,000** has been allocated. This budget will support operational costs, outreach, capacity building, grievance tracking, and reporting functions, ensuring effective functioning of the GRM as part of the ESMP.

9. ENVIRONMENTAL AND SOCIAL MANAGEMENT BUDGET

The cost of ESMP implementation for the Jalal Khan subproject shall be fully integrated into the contractor's BOQ and associated ESHS obligations, including staffing, monitoring, PPE, camp services, traffic safety, waste management, training, community engagement, and contingency measures. A detailed itemized ESHS cost schedule shall be included in the bidding and contract documents. The total cost of ESMP Implementation is 9,012,500 PKR and GRM implementation is PKR. 20, 00,000. Total 11,012,500/- PKR. The converted amount is roughly $39,470 USD.

10. CONCLUSION

The Jalal Khan Flood Dispersal/Weir subproject will generate two major positive impacts: flood protection for 2,745 people across 305 households, and improved spate irrigation for agricultural livelihoods, along with long-term climate resilience benefits. Construction-phase adverse impacts, including moderate effects on air quality, noise, and water quality, and low-to-moderate effects on biodiversity, community movement, and occupational safety, are all temporary, localized, and reversible. These will be mitigated effectively through the integrated ESMP, the mandatory Contractor's ESMP (C-ESMP), and the active PIU and PDSC monitoring program.

1

INTRODUCTION

1. INTRODUCTION

1.1 PROJECT BACKGROUND

Balochistan Province, the largest province of Pakistan, faces profound and interconnected development challenges rooted in water scarcity, climate vulnerability and recurrent natural disasters. The province has experienced multiple catastrophic flood events in recent decades, most notably the monsoon floods of 2010 and 2022, which caused extensive destruction of infrastructure, agricultural lands and rural settlements, with long-lasting impacts on livelihoods and food security. Within this context, BWSPIP includes the Jalal Khan subproject as a priority flood risk reduction intervention in the Kachhi Plain. This ESMP addresses the environmental, social, labor, occupational health and safety, and community health and safety aspects of that site-specific intervention.

Key contextual factors justifying BWSPIP include:

1. **Chronic water scarcity** – Annual precipitation in much of Balochistan averages 200–300 millimeters, and as low as about 8 centimeters in the Kachhi Plain, while evapotranspiration rates are often 10 times higher than precipitation, creating severe and persistent water stress for agriculture, livestock and human consumption.
2. **Hydrological extremes** – Rivers are characterized by long periods of low or no flow interspersed with intense flash floods capable of destroying infrastructure and displacing populations, making water resource management exceptionally challenging.
3. **Agricultural dependency** – Rural economies depend heavily on irrigated agriculture, particularly spate irrigation (flood-based farming) in the Kachhi and Bolan Plains, so agricultural productivity is highly sensitive to both water availability and flood frequency and intensity.
4. **Climate change amplification** – Climate projections indicate rising temperatures, more variable and intense precipitation and more frequent extreme weather events, exacerbating existing water scarcity and flood risks and requiring urgent adaptation investments.
5. **High poverty and vulnerability** – Balochistan have among the highest poverty rates in Pakistan, with limited livelihood alternatives beyond agriculture and livestock; households are therefore highly exposed to climate shocks and livelihood disruptions.
6. **Infrastructure deficit** – Decades of underinvestment have left the province's water infrastructure—dams, barrages, embankments and irrigation systems—in poor condition and ill-equipped to withstand current and future climate extremes.
7. **Development lag** – Limited water security and frequent disruption from floods and droughts constrain human development outcomes, contributing to high child malnutrition, low school enrolment (particularly for girls) and scarce livelihood opportunities.

Within this context, the BWSPIP has been designed to improve water security, strengthen flood protection and build climate resilience through integrated investments in infrastructure, watershed management and institutional strengthening, with the Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin (FD/W) as one of the priority sub-projects in the Kachhi Plain.

1.2 PROJECT OBJECTIVES

For this ESMP, the relevant project objective is to strengthen water security and reduce flood risk through climate-resilient infrastructure and improved management arrangements in the subproject area.

BWSPIP expected development outcomes:

1. Improved water access and productivity – Expanded access to basic water supply and sanitation services (around 500,000 people) and improved agricultural water productivity through upgraded infrastructure and management.
2. Enhanced climate resilience – Approximately 80,000 people benefiting from climate-resilient infrastructure investments (flood protection, water conservation, irrigation improvements) with strengthened adaptive capacity.
3. Reduced disaster risk – Reduced community vulnerability to floods and droughts through improved infrastructure, early warning systems and disaster preparedness.
4. Food security and nutrition – Improved water security enabling higher agricultural production and more stable household food security, contributing to better nutritional outcomes.

Contribution to World Bank CPF outcome indicators:

- Indicator 1.3: Number of people provided with access to water, sanitation and hygiene services.
- Indicator 3.2: Number of people with enhanced resilience to climate risks.

1.3 PROJECT SCOPE

The scope of the Balochistan Water Security and Productivity Improvement Project (BWSPIP) covers flood protection, irrigation modernization, watershed management and institutional strengthening to improve water security and agricultural productivity in the Kachhi Plain and other selected areas. For the sub -project “Jalal Khan flood dispersal/weir and construction of the allied structures” , the scope focuses on construction of a 42.66-meter RCC weir structure, and construction of one head regulator and one under-sluice. The works also involve installation of five gates, earthwork for approximately 2,000 meters of irrigation channels and guide bunds, and associated works required to provide reliable flood protection and safeguard adjacent settlements and agricultural land.

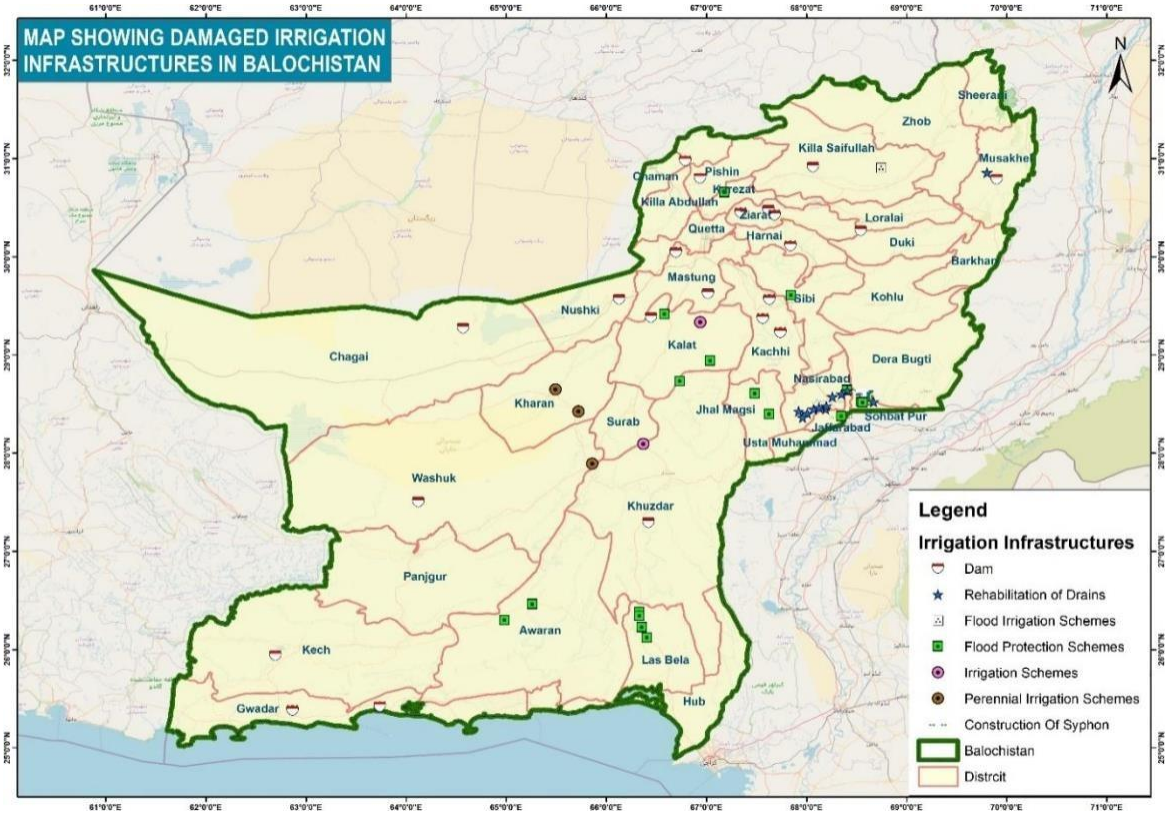


Figure 1-1: Location map showing the sites of the sub-project

1.4 OBJECTIVES OF ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN (ESMP)

The Environmental and Social Management Plan (ESMP) has been prepared in compliance with the World Bank's Environmental and Social Framework (ESF), including Environmental and Social Standards (ESS1–ESS10), the Environmental and Social Commitment Plan (ESCP), and Relevant national and provincial environmental and social legislation. The ESMP provides an operational framework for implementing and managing the mitigation and monitoring measures required for project activities, in close coordination with the BWSPIP Environmental and Social Management Framework (ESMF). The sub-project shall ensure compliance with the World Bank ESF, with particular application of ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, and ESS10 to the Jalal Khan subproject, while maintaining precautionary provisions where relevant screening identifies a need for additional measures.

The main objectives of the ESMP are to:

1. **Ensure Legal and Regulatory Compliance:** Verify that all subproject activities comply with Relevant national and provincial laws and regulations, including BEPA 2012, Balochistan OSH Act 2022, NEQS, and relevant labor laws, in addition to World Bank ESF requirements and the BWSPIP ESCP.
2. **Ensure compliance:** Ensure compliance with the World Bank ESF, with particular application of ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, and ESS10 to the Jalal Khan

subproject, while maintaining precautionary provisions where relevant screening identifies a need for additional measures.

3. **Identify and assess impacts:** Systematically identify and assess all potential environmental and social impacts (positive and negative) throughout the project lifecycle.
4. **Develop mitigation measures:** Apply the mitigation hierarchy (Avoid → Minimize → Mitigate → Restore/Offset) to prevent, reduce or compensate adverse impacts, with detailed measures consolidated in Table 7-2.
5. **Institutional Arrangements:** Propose the institutional arrangements required to implement and monitor the ESMP.
6. **Establish monitoring systems:** Define clear indicators, baselines, frequencies, responsibilities and reporting mechanisms for environmental, social, health and safety performance, consistent with NEQS and other standards.
7. **Protect workers and communities:** Ensure occupational health and safety (OHS), fair labor conditions, community health and safety, and protection of vulnerable groups, including women, children, the elderly and persons with disabilities.
8. **Facilitate stakeholder engagement:** Support transparent, inclusive and culturally appropriate engagement with affected communities, civil society and other stakeholders, in line with the Stakeholder Engagement Plan (SEP).
9. **Establish grievance mechanisms:** Provide accessible and culturally appropriate grievance redress mechanisms for communities and a dedicated Worker GRM for all categories of project workers.
10. **Build capacity:** Strengthen the environmental and social management capacities of contractors, PIU staff, PDSC, and community members through structured training and on-the-job support.
11. **Allocate resources:** Ensure adequate budgeting and resource allocation for ESMP implementation, monitoring, training and stakeholder engagement.
12. **Enable adaptive management:** Establish feedback loops, incident-learning and adaptive management procedures to respond to emerging issues during construction and operation.

Stepwise contractual obligations for contractors:

- Familiarity with WB ESF and ESCP – Contractors must be familiar with the World Bank Environmental and Social Framework, ESCP and relevant guidelines and standards.
- Site selection for facilities – Campsites, batching/crushing plants, workshops and machinery yards must be selected and designed in accordance with ESMP and ESMF guidelines (including siting away from settlements and water bodies).
- Human resources – The ESMP specifies the environmental, social and OHS staff required for compliance, reporting and performance improvement (e.g. Environmental Officer, OHS Officer, Social/HR focal person).
- The ESMP shall be kept with the Contractor so that he may comply with its

requirements. Any work executed by the Contractor, or on behalf of the Contractor (including sub-contractors), shall be in accordance with the ESMP.

- Mitigation measures – Activity-specific mitigation measures must be incorporated into the Contractor's ESMP (C-ESMP) and contracts to maximize benefits and control negative impacts.
- Climate-resilient infrastructure – The ESMP emphasizes combining "grey" and "green" solutions; contractors must integrate environmental measures during construction to achieve resilient and inclusive infrastructure.
- Roles and responsibilities – The ESMP clarifies the responsibilities of the Contractor, PDSC, and PIU for environmental and social performance.
- Environmental and social trainings – The ESMP sets out the need and frequency of environmental, OHS, CHS and social trainings for contractor and project staff.
- Environmental and social budgeting – Overall budget estimates and breakdowns for ESMP implementation guide contractors in preparing realistic cost provisions.
- Documentation and reporting – The ESMP specify documentation and reporting requirements, including monthly ESMP monitoring reports, incident reports and GRM summaries.
- Inspection and supervision – The ESMP define inspection and supervision frequencies by Contractor, PDSC, PIU and the World Bank.
- Contractor's ESMP (C-ESMP) – The Contractor will prepare and implement a C-ESMP, including site-specific plans for OHS, camp management, traffic and road safety, community health and safety, emergency response, waste and spoil management, air/noise/dust control, and worker grievance procedures, all consistent with the BWSPIP LMP and this ESMP, including at least:
    - Campsite / Camp Management Plan
    - Waste and Spoil Management Plan
    - Occupational Health and Safety Plan
    - Emergency Response and Preparedness Plan
    - Traffic Management and Road Safety Plan
    - Solid and Liquid Waste Management Plan
    - Air Quality, Noise and Dust Management Plan
    - Biodiversity Management measures (flora and fauna)
    - Community Health and Safety Plan
    - Labor Management and Worker Grievance procedures

1.5 APPROACH AND METHODOLOGY

Table 1-1: Methodology for ESMP Preparation

Sr. No.	Component	Description
	Data Collection & Literature Review	Sub-project documents, including the BWSPIP ESMF, and other published and unpublished information/data were collected and reviewed.
Sr. No.	**Component**	**Description**
2	Review of Legal and Institutional Framework	Relevant national environmental and social regulations and the World Bank ESF were reviewed, and institutional capacity, roles and responsibilities were assessed for all project stages.
3	Baseline Environmental & Social Survey	Environmental and social baseline studies were carried out (ambient air, surface and groundwater, soil, noise, socio-economic and ecological environment), sensitive receptors were identified and local communities consulted.
4	Impact Assessment & Analysis	Likely impacts (positive and negative) during implementation and operation were identified and classified (direct, indirect, long-term, short-term and cumulative).
5	Mitigation and Enhancement Measures / Options	Mitigation options were planned for pollution control, biodiversity management, waste management, occupational and community health and safety and other mandatory measures, applying the mitigation hierarchy; enhancement measures for positive impacts were also identified.
6	Stakeholder Consultation & Disclosure	Initial participatory meetings were held with affected communities and stakeholders; feedback has been integrated and will continue to inform ESMP updates as a standalone, living document during implementation.
7	ESMP Document	Mitigation measures have been tabulated in detail; a monitoring plan (including methodology, frequency and responsibilities), training and capacity-building requirements, stakeholder engagement and GRM arrangements, and ESMP budget and resource allocations have been developed.

8	Disclosure and Community Communication	A non-technical summary of the ESMP in Urdu and/or other local languages in Brahui or Balochi will be prepared and disclosed in the project website as for as will be shared with affected communities before civil works start. ESMP disclosure date will be read as first week of approval of the ESMP form bank.

Consultation findings, baseline information, and screening results were integrated into the impact assessment, mitigation measures, monitoring framework, and institutional arrangements presented in Chapters 5, 6, and 7.

1.6 DATA COLLECTION

A purposive, proportionately distributed sample was used to capture the conditions of the directly affected villages and key socio-economic groups, including women-headed households, landless households, and other vulnerable persons.

Primary data for this ESMP was gathered through:

- Field visits and walk-through assessments.
- Household surveys (45 households sampled from 305 households, i.e. 14.75% sample).
- In-depth interviews with male and female respondents.
- Key informant interviews with community leaders, elders and local officials.
- Community consultations and Focus Group Discussions (FGDs).
- Separate sessions with women facilitated by trained female enumerators, in line with local cultural norms.

Secondary data on environmental and socio-economic aspects was obtained from:

- BWSPIP project documents and ESMF.
- Government reports and district statistics.
- Previous environmental and social assessments and studies in the region.
- Climate and hydrological data from meteorological and hydrological stations.
- Census data (Pakistan Census 2023) and other official statistics.

1.7 SUB-PROJECT AREA

The Jalal Khan Flood dispersal / weir and allied structures at Jalal khan is located in Kachhi District, Balochistan, at geographic coordinates:

- Latitude: 29°03'10.7"N
- Longitude: 67°44'31.9"E

The flood dispersal/weir and allied structure is locatied at the confluence of the Bolan and

Naari rivers is highly significant: this confluence is one of the most flood-prone areas in the Kachhi Plain, with a long history of devastating floods. The combined spate flows during monsoon season provide essential water for spate irrigation but frequently cause catastrophic inundation affecting nearby communities and agricultural lands.

Table 1-2: Distance of nearby villages from the Jalal Khan weir / dispersal structure

Sr. No	Village	Distance from FD/W
1	Rehanzai New	1.145 km
2	Rehanzai Kohna	1.59 km
3	Jamra	2.42 km
4	Jalal Khan	4.91 km
	Total	–

All these communities lie within the flood impact zone and stand to benefit substantially from improved flood protection; Rehanzai New, being closest to the confluence, faces the highest flood risk. The sub-project is intended exclusively for flood protection purposes, focusing on rehabilitation and strengthening of the existing damaged flood dispersal structure to ensure effective flood management and safeguard adjoining areas from inundation. The sub-project area does not lie within or near any legally protected area, conservation area, wetland, designated buffer zone or other officially recognized vulnerable ecological area.



Figure 1-2: Photographs of damaged dispersal structure (Junction of Bolan & Naari River)

1.8 STUDY TEAM

Table 1-3: Field Survey Team

Sr. No.	Name	Position / Role
1	Mr. Naqeeb Ullah	Social Specialist
2	Mr. Shakoor Kakar	Socio-economic baseline and consultations
3	Mr. Muhammad Ahsan	Environment and Gender Team Lead
4	Ms. Qaisara Khan	Female Community Resource Person

2

LEGAL AND POLICY FRAMEWORK

2. LEGAL AND POLICY FRAMEWORK

2.1 LEGAL AND RELEVANT REQUIREMENTS

This ESMP has been prepared in accordance with the World Bank Environmental and Social Framework (ESF), including the Environmental and Social Standards (ESS1–ESS10), the BWSPIP Environmental and Social Commitment Plan (ESCP), and the BWSPIP Environmental and Social Management Framework (ESMF). It also reflects the Relevant provisions of Pakistan's and Balochistan's environmental, labor, occupational safety, public health, and cultural heritage regulatory framework, including the Balochistan Environmental Protection Act (BEPA) 2012, the National Environmental Quality Standards (NEQS), and relevant sectoral laws and technical guidelines issued by the Government of Pakistan and the Government of Balochistan.

As specifically required by the World Bank, the World Bank Group General Environmental, Health, and Safety (EHS) Guidelines (April 2007) apply to this sub-project and all works contracts thereunder. Contractors and sub-contractors are required to implement these Guidelines in full, particularly with respect to occupational health and safety, community health and safety, environmental management, and construction and decommissioning activities.

Compliance with this ESMP, the BWSPIP ESCP, and the General EHS Guidelines is mandatory for the PIU, the Project Design and Supervision Consultant (PDSC), the Contractor, and all sub-contractors engaged under the sub-project, throughout planning, pre-construction, construction, and operation. Where any inconsistency exists between national or provincial requirements and the World Bank ESF or the General EHS Guidelines, the more stringent requirement shall apply.

2.2 ENVIRONMENTAL & SOCIAL STANDARDS (ESS) AND NATIONAL REGULATIONS

All ESS were screened for the subproject. Based on current design and screening results, ESS1, ESS2, ESS3, ESS4, ESS6, and ESS10 are Relevant. ESS5, ESS7, ESS8, and ESS9 are not currently triggered, except that a chance-find procedure is retained as a precautionary measure for cultural heritage. The Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin subproject has been screened against the World Bank Environmental and Social Standards and the corresponding national and provincial regulatory framework. Based on the current design scope, site conditions, and screening findings, ESS1, ESS2, ESS3, ESS4, ESS6, and ESS10 are Relevant to this subproject. ESS5, ESS7, ESS8, and ESS9 are not expected to apply under the current subproject scope; however, this position remains subject to confirmation during final design, site establishment, and implementation. The screening outcome does not remove the obligation to apply precautionary measures where any issue related to land use, chance finds, vulnerable

groups, or other emerging risks arises during implementation.

These applicability determinations are based on the current design scope and remain subject to review during final design and implementation. Where gaps exist between national laws and World Bank ESF requirements, the more stringent provision applies, as detailed in Section 2.3 and Table 2-2. The detailed mapping of each ESS against the national and provincial regulatory framework is presented in Table 2-1.

Table 2-1: Environmental & Social Standards (ESS) Reflection into National Regulations and Provincial Laws

Environmental & Social Standard	Description	Applicability to the Sub-project	Relevant National / Provincial Regulation
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	Requires a risk-based approach to identifying and managing potential environmental and social risks and impacts.	Relevant	Balochistan Environmental Protection Act, 2012; Guidelines for Environmental Assessment; Review of IEE and EIA Regulations, 2020.
ESS2: Labor and Working Conditions	Protects workers' rights, health and safety; sets standards for working conditions, terms of employment and grievance mechanisms.	Relevant	Factories Act 1934; Balochistan Factories Act 2021; Balochistan Occupational Safety and Health Act 2022; Employment of Children Acts; Balochistan Minimum Wages, Payment of Wages, Shops and Establishments, Social Security and Industrial Relations Acts. The Balochistan Bonded Labor System (Abolition) Act, 2021

ESS3: Resource Efficiency and Pollution Prevention and Management	Promotes efficient use of energy, water and raw materials and control of pollution and hazardous materials.	Relevant	NEQS for air, water and noise; Balochistan Environmental Protection Act 2012; National Environmental Policy 2005; Pakistan Climate Change Act

Environmental & Social Standard	Description	Applicability to the Sub-project	Relevant National / Provincial Regulation
			2017; Hazardous Substances Rules.
ESS4: Community Health and Safety	Addresses risks and impacts on local communities from project activities, infrastructure, traffic, hazardous materials and emergencies.	Relevant	BEPA 2012; National Disaster Management Act 2010; Motor Vehicle laws; Balochistan OSH Act 2022; Public health regulations.
ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Governs compensation and assistance for people economically or physically displaced.	Relevant	Land Acquisition Act 1894 and amendments (relevant only if land acquisition occurs; anticipated for this sub-project).
ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Governs compensation and assistance for people economically or physically displaced. Voluntary Land Donation (VLD) has been applied for 60.68 acres across 14 land	Relevant	Land Acquisition Act 1894 (as relevant); BWSPIP RPF; VLD protocols as per approved BWSPIP RPF.

	parcels for channel construction. VLD documentation is being submitted to the World Bank for review and approval prior to contract award.		
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Protects biodiversity and regulates project impacts on natural habitats and ecosystem services.	Relevant	Forest Act 1927; Balochistan Forest Act 2022; Balochistan Wildlife Preservation, Protection, Conservation and Management Act 2014; BEPA biodiversity provisions.
ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Safeguards the rights, culture and livelihoods of Indigenous Peoples.	Not Relevant	No specific national law; Pakistan's recognized Indigenous Peoples (Kalash) do not reside in the project area.
ESS8: Cultural Heritage	Protects tangible and intangible cultural heritage from adverse project impacts.	Not Relevant (only chance finds expected)	Antiquities Act 1975 (and 1990 amendment); Balochistan Antiquity Act 2014 (applies

Environmental & Social Standard	Description	Applicability to the Sub-project	Relevant National / Provincial Regulation
			through Chance Find Procedures).
ESS9: Financial Intermediaries	Applies where financial intermediaries receive Bank funding.	Not Relevant	No financial intermediaries are involved in this sub-project.
ESS10: Stakeholder Engagement and Information Disclosure	Requires systematic stakeholder engagement, information disclosure and project-level GRMs.	Relevant	BEPA provisions for public consultation in IEE/EIA; Guidelines for Public Consultation 1997; Right to Information legislation.

This dual compliance framework provides assurance that the sub-project will be implemented in a sustainable manner, with due consideration for people, biodiversity and the broader environment.

2.3 WORLD BANK STANDARDS AND KEY GAPS WITH NATIONAL / PROVINCIAL FRAMEWORK

The sub-project follows the World Bank ESF, ESS1–ESS10, and the World Bank Group General EHS Guidelines (April 2007) for general and construction and decommissioning activities. The overall environmental and social risk for BWSPIP is classified as Substantial, and this ESMP has been prepared accordingly.

A comparative review of ESS requirements against national and provincial laws identifies key gaps in areas including ESF-specific risk management tools, labor and working conditions, resource efficiency, community health and safety, biodiversity screening, and ongoing stakeholder engagement. These gaps are detailed in Table 2-2 and are addressed through the BWSPIP ESMF, ESCP, LMP, SEP, SEA/SH Action Plan, and this site-specific ESMP.

One gap requiring specific elaboration beyond Table 2-2 relates to labor influx risk. Given the potential influx of non-local skilled workers at this remote sub-project site, and in accordance with the World Bank's specific direction, the World Bank Guidance Note: Managing the Risk of Adverse Impacts on Communities from Temporary Project-Induced Labor Influx (2016) applies to this sub-project and has informed the LMP and labor influx mitigation measures in this ESMP. Contractors must implement pre-mobilization labor influx risk

assessment; Code of Conduct for all workers; Worker and Community GRMs operational before civil works commence; SEA/SH prevention and response program; controlled worker camp management; and zero-tolerance enforcement on GBV, alcohol, and harassment. Where the Guidance Note is more stringent than national labor law, the Guidance Note applies.

The Balochistan Climate Change Policy 2024, which emphasizes climate adaptation and mainstreaming of environmental sustainability into development planning, is also relevant and this sub-project directly supports its mandates. Where any World Bank ESF or EHS Guidelines requirement is more stringent than national or provincial law, the more stringent requirement applies throughout sub-project implementation.

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

ESS	Project Relevance	Key National / Provincial Regulations	Key Gaps in Local Laws	How Gaps Are Addressed (ESMF/ESMP)
ESS1	Relevant – sub-project involves civil works with potential E&S risks.	BEPA 2012; IEE/EIA Regulations; EA Guidelines.	Project risk categorization and ESF-specific tools (ESMF, ESMP, ESCP) not explicitly required; limited attention to vulnerable groups and primary suppliers.	ESF-based risk categorization; preparation of ESMF, ESMP, ESCP; explicit consideration of vulnerable groups and supply-chain risks.
ESS2	Relevant – use of direct, contracted and primary supply workers.	Labor, OSH, minimum wage, child labor, bonded labor and industrial relations laws listed in ESMF.	Partial practical implementation of OHS, SEA/SH, VAC; no binding requirement for employer worker-GRMs.	BWSPIP LMP, SEA/SH Action Plan and Worker GRM (Section 7.6.5); OHS Plan and labor provisions in ESMP and contracts, Labor influx plan.
ESS3	Relevant – use of materials, generation of	NEQS; BEPA 2012; National Environmental	Emphasis on compliance with emission limits rather	Resource efficiency, air/noise/water/waste management measures in ESMP

ESS	Project Relevance	Key National / Provincial Regulations	Key Gaps in Local Laws	How Gaps Are Addressed (ESMF/ESMP)
	waste, emissions.	Policy; Climate Change Act.	than resource efficiency and integrated pollution prevention.	and Table 7-2; alignment with WBG EHS Guidelines.
ESS4	Relevant – construction traffic, flood infrastructure, CHS risks.	BEPA 2012; National Disaster Management Act; OSH Act; Penal Code.	Limited explicit coverage of project-level CHS management, road safety, and emergency preparedness linked to infrastructure.	Community Health and Safety and Traffic Management Plans; CHS measures and indicators in Table 7-2; emergency preparedness provisions.
ESS5	Not expected to be relevant at sub-project level.	Land Acquisition Act 1894 and amendments.	No livelihood restoration, no coverage of non-titleholders, limited consultation requirements.	RPF at BWSPIP level to manage any land-related risks; exclusion of sub-projects requiring significant land acquisition.
ESS6	Relevant – riparian corridors, rangelands and fauna present.	Forest laws; BWPPCMA 2014; Balochistan Forest Act 2022.	No explicit categorization of natural/critical habitats; limited guidance on project-level biodiversity assessments.	Exclusion of activities with significant adverse impacts on natural/critical habitats; biodiversity and fauna measures in ESMP (Sections 4.3, 6.6.5–6.6.7, Table 7-2).
ESS7	Not relevant – no Indigenous Peoples in area.	None specific.	No national law on Indigenous Peoples' rights.	Not Relevant to sub-project.

ESS	Project Relevance	Key National / Provincial Regulations	Key Gaps in Local Laws	How Gaps Are Addressed (ESMF/ESMP)
ESS8	Not expected to be directly triggered; chance finds possible.	Antiquities Act; Balochistan Antiquity Act 2014.	No explicit requirement for project-level Cultural Heritage Management Plans.	Chance Find Procedures (Annexure-D); CHMP to be prepared if any notified sites are affected.
ESS10	Relevant – multiple stakeholder groups and vulnerable communities.	IEE/EIA Regulations; BEPA consultation guidelines; RTI laws.	Stakeholder engagement often limited to IEE/EIA stage; no requirement for ongoing engagement or project GRMs.	SEP and GRM at BWSPIP level; community GRM (Section 7.6) and Worker GRM (Section 7.6.5) in ESMP.

2.3.1 Occupational Health & Safety (OHS) Guidelines

During project implementation, the Contractor will comply with the World Bank Group and IFC General EHS Guidelines, including the Construction and Decommissioning Guidelines, which provide good international industry practice for OHS, community health and safety and environmental management. Key OHS themes include, facility design and operation, communication and training, physical and chemical hazards, PPE, work in special hazard environments and OHS monitoring. Community health and safety topics include water quality and availability, structural safety, life and fire safety, traffic safety, hazardous materials transport, disease prevention and emergency preparedness and response. These requirements are operationalized through the OHS Plan, CHS and Traffic Management Plans, waste management plan and other CESMP components set out in Section 7.8.

2.3.2 National / Provincial Guidelines, Policies and Acts

In addition to BEPA 2012 and PEPA 1997, the ESMP takes into account the following policies and acts, which inform the design and implementation of mitigation measures:

- **National Environmental Policy (2005):** commits to integrating environmental considerations into development planning, including pollution control, rangeland restoration, biodiversity conservation and cultural heritage protection.
- **National Conservation Strategy:** identifies priority programs including pollution prevention, rangeland restoration, support for plantations and biodiversity conservation.

- **Pakistan Climate Change Act (2017):** provides the framework for climate-resilient development; the sub-project supports this Act by “building back better” and enhancing resilience to flood risks.
- **The Balochistan Climate Change Policy 2024:** is a comprehensive framework designed to enhance the province's resilience against extreme weather events like droughts and floods through nature-based solutions and climate-resilient infrastructure. It prioritizes sustainable natural resource management and social inclusion, establishing a dedicated Climate Change Fund to support local adaptation, green jobs, and the protection of its 750-kilometer coastline.
- **National Disaster Management Act (2010):** underpins disaster risk reduction and disaster management structures; the sub-project contributes to risk reduction and climate-resilient reconstruction.
- **Balochistan Wildlife Preservation, Protection, Conservation and Management Act (2014):** relevant to management of wildlife and habitats; ESMP biodiversity measures ensure compatibility.
- **Balochistan Antiquity Act (2014):** guides protection of cultural heritage; implemented through Chance Find Procedures and, if needed, Cultural Heritage Management Plans.
- **Balochistan labor legislation (Employment of Children, Payment of Wages, Factories Act, OSH Act, etc.):** applied through the BWSPIP LMP and project labor requirements to ensure lawful working conditions.
- **Balochistan Occupational Safety and Health Act 2022:** This Act establishes mandatory OHS obligations for all employers operating in Balochistan, including construction contractors. It requires employers to assess workplace hazards, provide PPE, report occupational injuries and illnesses, and maintain safe working conditions. For this subproject, the Act is directly relevant to the Contractor and is reflected in the OHS Plan obligations under Section 7.8.1 and in the mitigation measures set out in Table 7-5.

2.3.3 International Treaties and Conventions

Pakistan is a party to numerous multilateral environmental and social agreements relevant to this sub-project, including conventions on biodiversity, climate change, wetlands, labor standards, human rights and cultural heritage. The ESMP respects Pakistan’s obligations under these agreements, including the Convention on Biological Diversity (UNCBD), UN Framework Convention on Climate Change (UNFCCC) and Paris Agreement, Ramsar Convention on Wetlands, ILO conventions on child labor, forced labor and non-discrimination, and UNESCO conventions on world and intangible cultural heritage (see Table 2-3).

Table 2-3: Selected International Treaties and Conventions Relevant to the Sub-project

Sr. No.	Environmental Obligations	Social Obligations
1	Convention on the Conservation of Migratory Species of Wild Animals (CMS)	International Covenant on Economic, Social and Cultural Rights
2	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), 1979

Sr. No.	Environmental Obligations	Social Obligations
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)	Forced Labor Convention, 1930 (No. 29) and Abolition of Forced Labor Convention, 1957 (No. 105)
5	Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention)	Minimum Age Convention, 1973 (No. 138) and Worst Forms of Child Labor Convention, 1999 (No. 182)
6	Kyoto Protocol to the UNFCCC	International Covenant on Civil and Political Rights, 1966
7	Stockholm Convention on Persistent Organic Pollutants	Equal Remuneration Convention, 1951 (No. 100) and Discrimination (Employment and Occupation) Convention, 1958 (No. 111)
8	Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)	Hours of Work (Industry) Convention, 1919 (No. 1)
9	Paris Agreement, 2015	Indigenous and Tribal Populations Convention, 1957 (No. 107)
10	Vienna Convention for the Protection of the Ozone Layer, 1985	Convention for the Safeguarding of the Intangible Cultural Heritage, 2003

3

DESCRIPTION OF THE SUBPROJECT

3. DESCRIPTION OF THE SUBPROJECT

This chapter describes the salient features of the Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin sub-project under the flood protection and irrigation rehabilitation component of BWSPIP in the Kachhi Plain, Kachhi District, Balochistan. It summarizes the sub-project location, design parameters, key pre-construction and construction activities, and indicative work phasing to the extent relevant to environmental and social risk management. Detailed engineering drawings, structural specifications, and the construction program form part of the engineering design package and bidding documents. The Contractor shall prepare and submit a detailed work plan, site layout, and method statements as part of the Contractor's ESMP (C-ESMP) for PDSC and PIU approval before any civil works commence, as required under Section 7.8 of this ESMP.

3.1 CONSTRUCTION ACTIVITIES

The main engineering activities of the sub-project include construction of a RCC weir structure, site/bushes clearance and stripping, construction of one head regulator and one under-sluice. The works also involve fixing of gates, earthwork for construction of irrigation channels and guide bunds, and associated steelworks. In addition, uprooting of tree stumps with girth ranging from 1.5 ft to 6 ft (0.50 m to 1.75 m) and their removal within 1 km will be carried out. The details of engineering activities to be carried out at each package are provided in the table below

Table 3-1: List of Construction Activities at Jalal Flood Dispersal/Weir and Allied Structure

S. No	Activities	List of Associated Construction Activities
1	Pre-Construction Activities	• A joint survey of sites with PIU and PDSC Consultants. • Selection of suitable site for the establishment of contractor's camp. • Construction of contractor camp. • Relevant staff deployment for the start of Work. • Mobilization of machinery and equipment.
2	Construction	• Site clearance/bush Clearance and stripping • Cutting of 141 trees with in 1km. • Construction of temporary diversion channel • Earthwork for construction of Irrigation channels and guide bunds; 2000 meter • Sheet piling • Construction of head regulators; 1 No • Construction of under-sluice; 1 No • Fixing of gates; 5 Nos • Dewatering activity and sheet piling • Construction of foundation and guide walls • Concreting for foundation • Concreting of Stilling Basin • Concreting works for the foundation, stilling basin, and retaining walls

3.2 LOCATION OF SUB-PROJECT

The Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin (FD/W) is located in District at geographic coordinates Latitude 29°03'10.7"N and Longitude 67°44'31.9"E, at the confluence of the Bolan and Naari river systems, one of the most flood-prone zones in the Kachhi Plain. The sub-project involves rehabilitation and strengthening of the existing flood dispersal/weir and allied structure and associated protection works within the approved project footprint. The works are intended to reduce recurrent flood risks to nearby settlements, agricultural land, and local infrastructure, and to enhance the reliability of spate irrigation in the project area. The location map in Figure 3.1

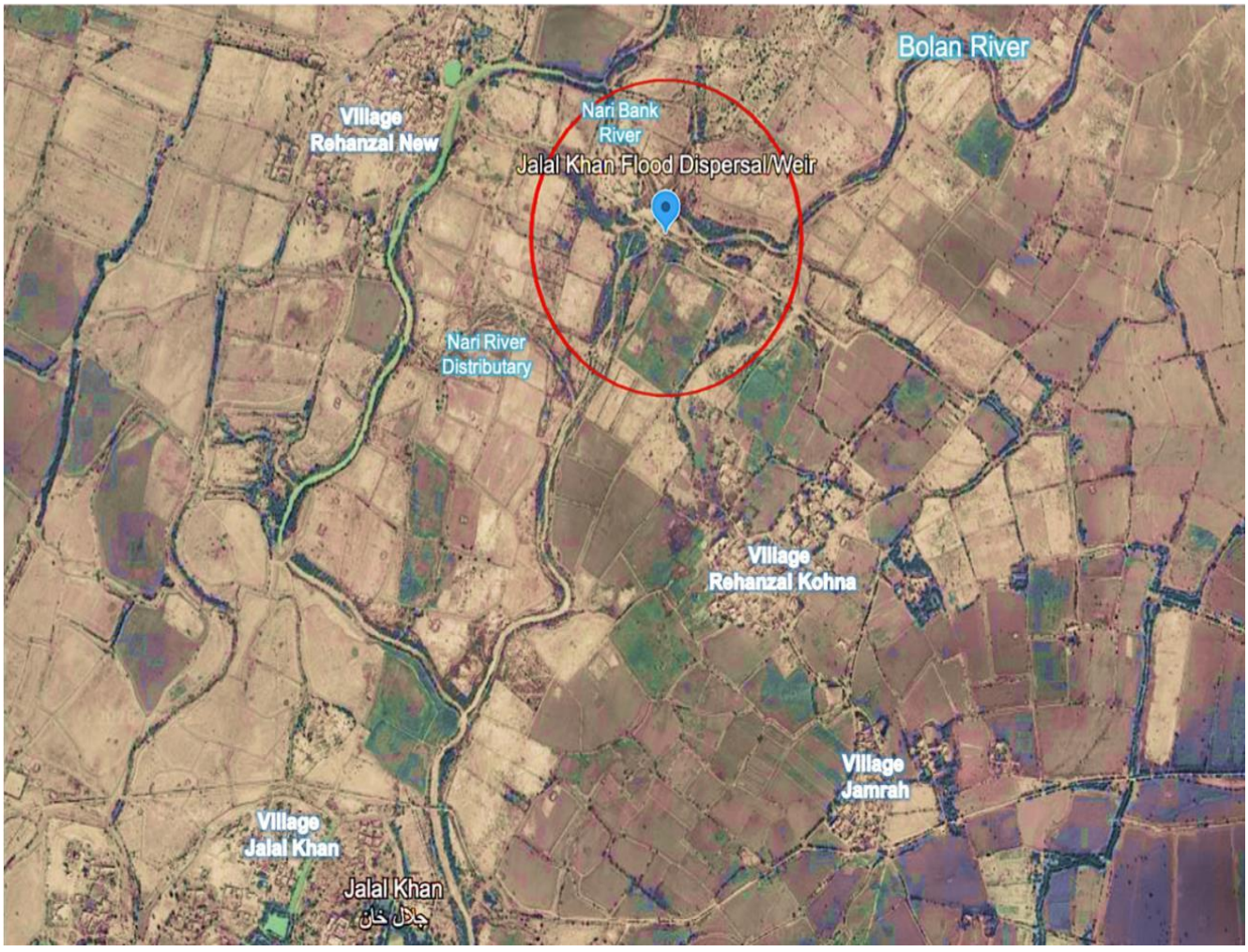


Figure 3-1: Location Map of Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin



Figure 3-2: Alluvial deposits (Clayey Silt, Silty Clay and Gravely Silt) along the riverbank.

3.3 CONSTRUCTION MATERIAL

The following table depicts the estimated quantities of the construction material to be used for the construction activities of the sub-project.

Table 3-2: List of Construction Material Required

Earth work for Embankment	Excavation	Concrete			Rubber Stopper	Steel	Stone Pitching	Steel Hydro Gate	G.I Wire netting	Shingle on top of bund	Staff hut & Generator Room
Cu.m	Cu.m		Cu.m		R.m	Tonne	Cu.m	Sq.m	Sq.m	Cu.m	Sq.m
314671	63254		8265		250	671	36332	**32.67**	21081	3780	140

Materials and Sourcing

The Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin sub-project requires essential construction materials including earth fill for embankments, stone for slope protection, and sand, gravel, and cement for concrete and filter layers. These materials will be identified and sourced from approved borrow areas and quarries within the Sulaiman Range foothills. All sources, including commercial suppliers, must be screened to ensure they are not located in environmentally sensitive areas, private lands without consent, or zones where extraction could cause erosion or community nuisance.

Table 3-3: Availability of construction material

Sr. No.	Raw material	Availability in the surrounding
1	Borrow material	The contractor will identify the site and get that approved by PDSC.
2	Stones for retaining walls and rip rap.	The contractor will identify the most viable site for stones and PDSC will approve accordingly.

Sr. No.	Raw material	Availability in the surrounding
3	Stone for sub-base, aggregate base course,	The site will be identified by the CC.
4	Sand	The contractor will identify the viable site for sand duly approved by the PDSC. (relevancy with borrow area on next page)
5	Water for compaction and sprinkling.	The availability of water for construction activities is expected to pose challenges at the Subproject site. However, the Contractor will address this issue with the approval of the PDSC. Construction water will be sourced either from tube wells or from surface water, as both options are accessible within the Subproject area.
6	Cement & Reinforcement materials	Since Jalal Khan is in the Kachhi district, therefore the access of market and availability of material will not be difficult. However, the CC will be responsible with the approval of PDSC.

3.3.1 Site Access and Traffic Management

The site is accessible via an unpaved track from the main Sibi-Lehri road through Union Council Bakhtiar Abad. While currently suitable for light vehicles, this route will require grading and widening to accommodate heavy machinery. The Contractor is required to develop a **Traffic Management Plan** as part of the C-ESMP, outlining haul routes, speed limits, and safety measures for settlements. To ensure accountability, the track's condition will be documented before work begins and must be fully reinstated to its original state upon project completion.

3.3.2 Site Clearance Work

During the earthworks, trees will be felled and vegetation cover will be stripped during the construction of the Jalal khan flood dispersal structure/weir, irrigation channels and guide bunds. During the survey 141 number of trees were recorded which are anticipated to be felled. The species of these trees include: Babur Prosopis cineraria ((Kandi/Jhang), Acacia Nilotica(Kikar), Salvadora oleoides (Khabar) and Ziziphus nummularia (Ber). Before the commencement of earthwork activities, the contractor, along with PDSC and PIU, will prepare and maintain an inventory of trees which are anticipated to be felled and the data to be recorded, including the name of the species and girth. While terrestrial vegetation cover will be stripped from the RoW and which includes approximately 1.6 km length. There are no invasive/indigenous species are found in the scheme area. During the site clearance works, the guideline of ECOPs on the protection of flora provided in section 6.6.5 and Environmental Code of Practices (ECOP) Appendix (H) shall be implemented by the contractor.

3.3.3 Contractor Camp and Machinery Yard

A self-contained camp and machinery yard will be established to accommodate the workforce and equipment and details should be provided in the C-ESMP and approved by PDSC and PIU before the commencement of physical work. To manage environment, social and gender risks and minimize community disturbance, the camp must be sited at least 500 meters from the nearest residential settlement on non-agricultural land. The facility will include essential sanitation, medical, and waste management units, alongside a secured machinery yard with containment protocols for fuels and lubricants. Following the completion of civil works, the Contractor is responsible for the full decommissioning of the site and restoring the land to its pre-construction condition.

Compliance and Approvals

As part of the C-ESMP, the Contractor must submit detailed plans for material sources, transport volumes, and mitigation strategies for dust, noise, and road safety. All proposed locations and haul routes are subject to formal review and approval by the PDSC and PIU to ensure alignment with environmental and social safeguards.

3.3.4 Borrow Area

No borrow areas have been pre-identified or approved at the time of preparation of this ESMP. All locations required for embankment fill, clay, sand, aggregate, and stone shall be identified by the Contractor during pre-construction, screened against mandatory environmental and social criteria, and formally approved in writing by the PDSC and PIU before any extraction commences. The Contractor shall prepare a Borrow Area Management Plan (BAMP) as part of the C-ESMP covering for each proposed location: GPS coordinates, material suitability confirmed by laboratory testing, documented land ownership or voluntary agreement, environmental and social screening confirming the site is minimum 500 meters from sensitive receptors, minimum 100 meters from any water body, not on productive agricultural land, ecologically sensitive areas, active river channels, or any location with unresolved community objections registered through the GRM. The PDSC shall issue written clearance within fourteen days of a complete submission and the PIU Environmental Specialist shall conduct independent field verification before final approval is confirmed. No extraction shall commence before both approvals are in writing. During operations the Contractor shall strip and stockpile topsoil separately, maintain stable excavation slopes, install sediment controls, and fence and sign all active excavations. Upon completion all borrow areas shall be restored through re-grading, topsoil replacement to minimum 0.3 meters, revegetation with locally appropriate species, and waste removal, with PIU verification inspections at six- and twelve-months post-completion.

Before any borrow area becomes operational, the Contractor must sign a formal written agreement with the landowner. This agreement must cover: the exact area (in acres) of land to be used, the period of use with start and end dates, agreed compensation or terms if any, restoration obligations including timeline and standard, and a commitment to return the land to its original usable condition. The agreement must be written in Urdu or Balochi as preferred by the landowner, witnessed by a Farmers Organization representative, and submitted to

both the PIU and PDSC before extraction begins. No borrow material shall be extracted from any site until the signed agreement is on file with the PIU.

3.3.5 Contractor's Camp

Where the scale and duration of works necessitate on-site worker accommodation, the Contractor shall establish a temporary camp only after the proposed location has been formally screened and approved in writing by the PDSC and PIU. The camp shall be sited a minimum of 500 meters from the nearest residential settlement, school, health facility,mosque, graveyard, or other sensitive community receptor, and shall not be placed on active drainage paths, productive agricultural land, community grazing areas, irrigation structures or their right-of-way, or any ecologically or socially sensitive location. Where private land is required, the Contractor shall provide documented evidence of a voluntary, lawful rental or lease arrangement acceptable to the PDSC and PIU prior to site use. The land area and sub-site arrangements shall be detailed in the Contractor's ESMP (C-ESMP), including a scaled site layout plan, land status documentation, utility and drainage provisions, sanitation and waste management arrangements, and camp management procedures, all subject to PDSC and PIU approval before mobilization.

The camp shall safely accommodate all required facilities including worker sleeping quarters, site office, kitchen and mess, safe drinking water, gender-segregated sanitation, approved wastewater disposal, a stocked first-aid room, designated prayer space, solid waste storage, properly bunded fuel storage, fire safety equipment, security arrangements, and machinery parking. The Contractor shall maximize employment of unskilled labor from the local population of Jalal Khan and nearby villages, and shall also utilize locally available skilled labor wherever feasible. Camp operations shall comply fully with ESS2, ESS3, ESS4, the BWSPIP Labor Management Procedures (LMP), and the WBG General EHS Guidelines. Open defecation, discharge of untreated wastewater, uncontrolled waste disposal, unsafe fuel storage, child labor, and any form of harassment or intimidation are strictly prohibited and shall constitute serious contract breaches.

As it's an old schemes rehabilitation and with the involvement of the stakeholders so they have commonly identified a contractor's camp which is near to the construction site and away from the population and sensitive receptors, it with the consent of the community and the contractor will be provided the space as per his requirements.

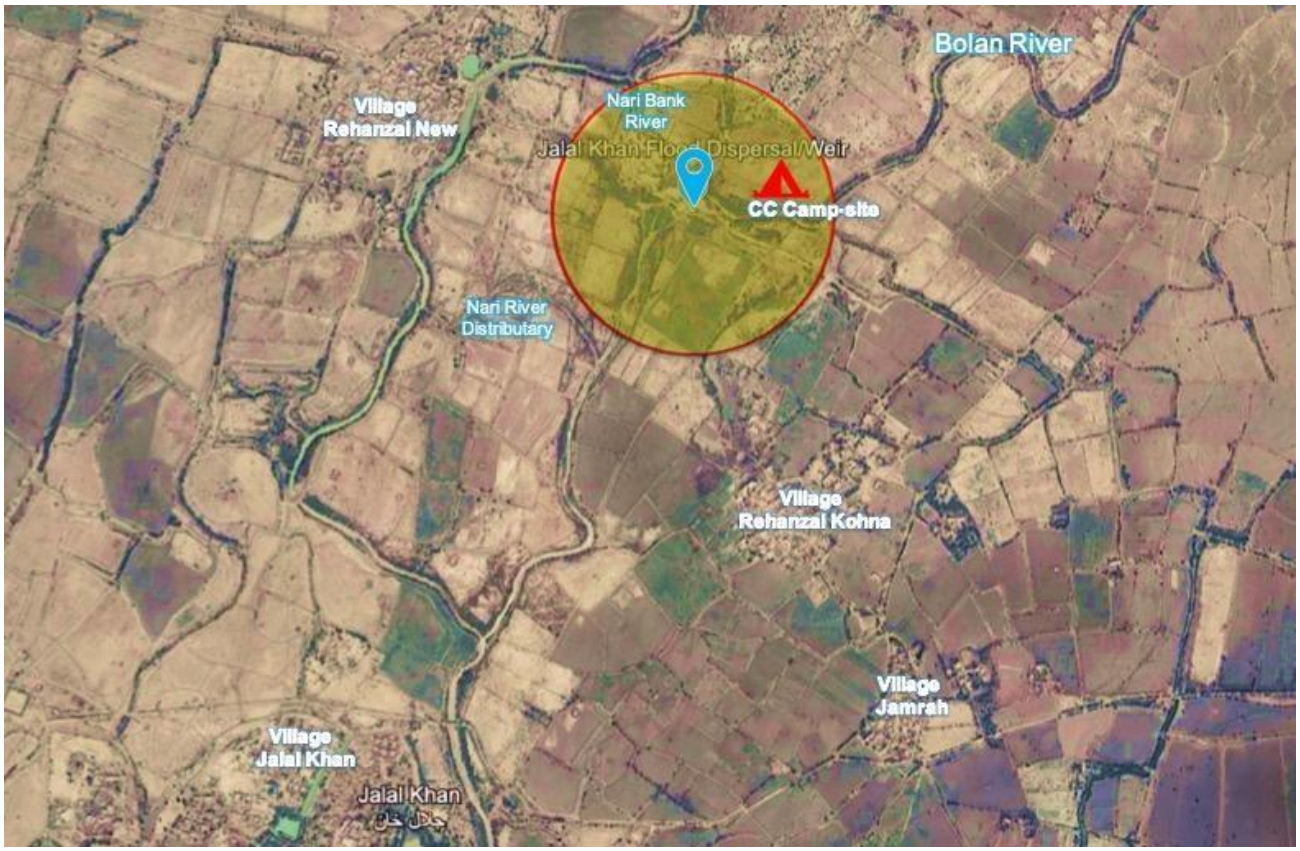


Figure 3-3: Digital map of the proposed contractor camp site

3.3.6 Standards for the Construction of Workers Accommodation

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

Table 3-4: Availability of construction material

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.

Activity	Guidelines
	- 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

Activity	Guidelines
	- Provide HIV awareness programming, including STI (sexually transmitted infections) and HIV information, education, and communication for all workers regularly. - No handshakes and hugs.
Activity	**Guidelines**
	- The disinfection of all camp areas shall be carried out on regular basis. - Items like tissue papers, surgical masks, and gloves are made available and worn all the time while maintaining a physical distance of 2 m (6.5 ft). - Hand-washing areas shall be constructed with the facility of clean water soap, and hand- wash at least 20 seconds several times. - Use a face mask and latex gloves - Install alcohol-based sanitizer dispensers (sensor-based) in each room and kitchen area. Make sure these dispensers are regularly refilled.
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.
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

Activity	Guidelines
	- The presence of stagnant water is a factor in the proliferation of potential disease vectors such as mosquitoes, flies, etc., and must be avoided and away from campsites and the community.
Site Restoration	- Backfill waste and sewage pits - Consider seeding the area to provide an initial protective canopy - Give prior notice to the laborers before demolishing their camps/units - Maintain the noise levels within the national standards during demolition activities - Reuse the camp material to the maximum extent. Dispose of remaining debris at the designated waste disposal site. - To restore the site to its original condition or an agreed condition with the landowner defined before the commencement of the works (in writing). - Dismantle and remove from the site all facilities established within the construction camp, including the perimeter fence and lockable gates after the construction work. - Decommission and fill drinking water wells (unless otherwise arranged with the landowner) - If possible, dismantle camps in phases as the work decreases (do not wait for the completion of the entire work)

3.4 MACHINERY YARD AND OTHER FACILITIES

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

Requirement of Machinery and Equipment

It is estimated that machinery/equipment will be required for the Subproject. However, the machinery/equipment provided by the CC should be fit for construction work. The list of machinery/equipment is given below:

Table 3-5: List of machinery/equipment

Sr. No.	List of machinery/equipment	Quantity
1	Excavator	02
2	Dumper Truck	4
3	Grader	01
4	V-Roller	01
5	Static Roller	02
6	Concrete batching plant, (at least one cubic meter capacity)	01
7	Concrete pump	02
8	Transit Mixers	03
9	Level Machine	01
10	Tractors with various attachments like (blades, loaders, trolleys)	04
11	Water Bowser	08
12	Electric Generator	04
13	Portable Pumps with Engines	04

3.5 CONSTRUCTION SCHEDULE & WORK PLAN

The following table provides the details and timeline of pre-construction and construction phase activities to be carried out at flood dispersal structure Jalal Khan.

Table 3-6: Construction Work Plan/Schedule

S. No	Activities	Duration (in number of days)
1	Pre-Construction Phase Activities	90 days
2	Construction of RCC Weir, Head Regulator and Under-sluice	615 days
3	Fixing of Gates	90 days
4	Construction of Guide Bunds	120 days
5	Construction of Irrigation Channel	150 days
6	Post Construction Phase Activities	30 days

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S.No	Activities	Start Date	End Date	Duration
1	Pre-Construction	1-Aug-26	29-Oct-26	3 Month
2	Weir + Regulator	30-Oct-26	5-Jul-28	21 Month
3	Fixing Gates	6-Jul-28	3-Oct-28	3 Month
4	Guide Bunds	4-Oct-28	31-Jan-29	4 Month
5	Irrigation Channel	1-Feb-29	30-Jun-29	5 Month
6	Post-Construction	1-Jul-29	30-Jul-29	1 Month

Figure 3-4: Work Plan for Executing Engineering Activities

3.6 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.

The Contractor shall implement a comprehensive Security Management Plan to ensure the safety of all employees and the protection of project infrastructure. Given the project's proximity to Jalal Khan, the following measures will be established:

- **Access Control:** The base camp and active construction zone will be fenced, with regulated entry points managed by local and trained security guards to prevent unauthorized access to the point.
- **Personnel Identification:** All staff and laborers will be issued official project ID cards, which must be displayed at all times while on-site.
- **Community Coordination:** A focal person will be designated to maintain regular liaison with local community elders in nearby settlements and relevant law enforcement agencies to monitor the regional security situation and mitigate potential risks.
- **Code of Conduct:** All security personnel will be trained on a formal Code of Conduct, emphasizing professional behavior, the use of non-violent protocols, and respect for the local customs and privacy of the residents of Jalal Khan.
- **Emergency Response:** A security communication protocol will be established, including an emergency contact directory and a designated assembly point in the event of a security-related evacuation.

3.7 LABOR REPORTING OFFICE

Designated Labor 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 Labor 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 Labor gathering points are safe, well-maintained spaces where workers can assemble for transport, respond during emergencies, or receive awareness and toolbox trainings.

4

BASELINE DESCRIPTION

4. BASELINE DESCRIPTION

The **baseline description** provides an integrated overview of the physical, ecological and socio-economic conditions in the proposed sub-project area. It is based on a combination of primary field data (surveys, measurements and observations) and relevant primary and secondary sources, including published reports and official statistics. This baseline serves as the **reference condition** against which future environmental and social changes, whether resulting from the project or external factors, will be monitored, evaluated and managed throughout construction and operation.

4.1 CORRIDOR OF IMPACT (COI)

The **Corridor of Impact (COI)** defines the spatial extent within which environmental and social impacts from sub-project activities are anticipated. For the Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin, the COI comprises:

- **Primary Impact Zone:** The sub-project Right-of-Way (RoW), including the flood dispersal/weir and allied structure alignment (approximately 1.6 km length), embankment footprint, and immediately adjacent riverbanks.
- **Secondary Impact Zone:** Construction support facilities, including contractor camps, borrow areas, material storage sites, access roads, and spoil disposal locations.
- **Tertiary Impact Zone:** A 500-meter buffer (250 meters on each side of the dispersal structure centerline) extending from the RoW boundary.

This 500-meter COI was established through technical assessment and field reconnaissance to adequately capture direct construction-related impacts, including fugitive dust dispersion, noise propagation, construction traffic disturbance, and temporary access disruption, while remaining practical for baseline survey coverage and environmental monitoring.

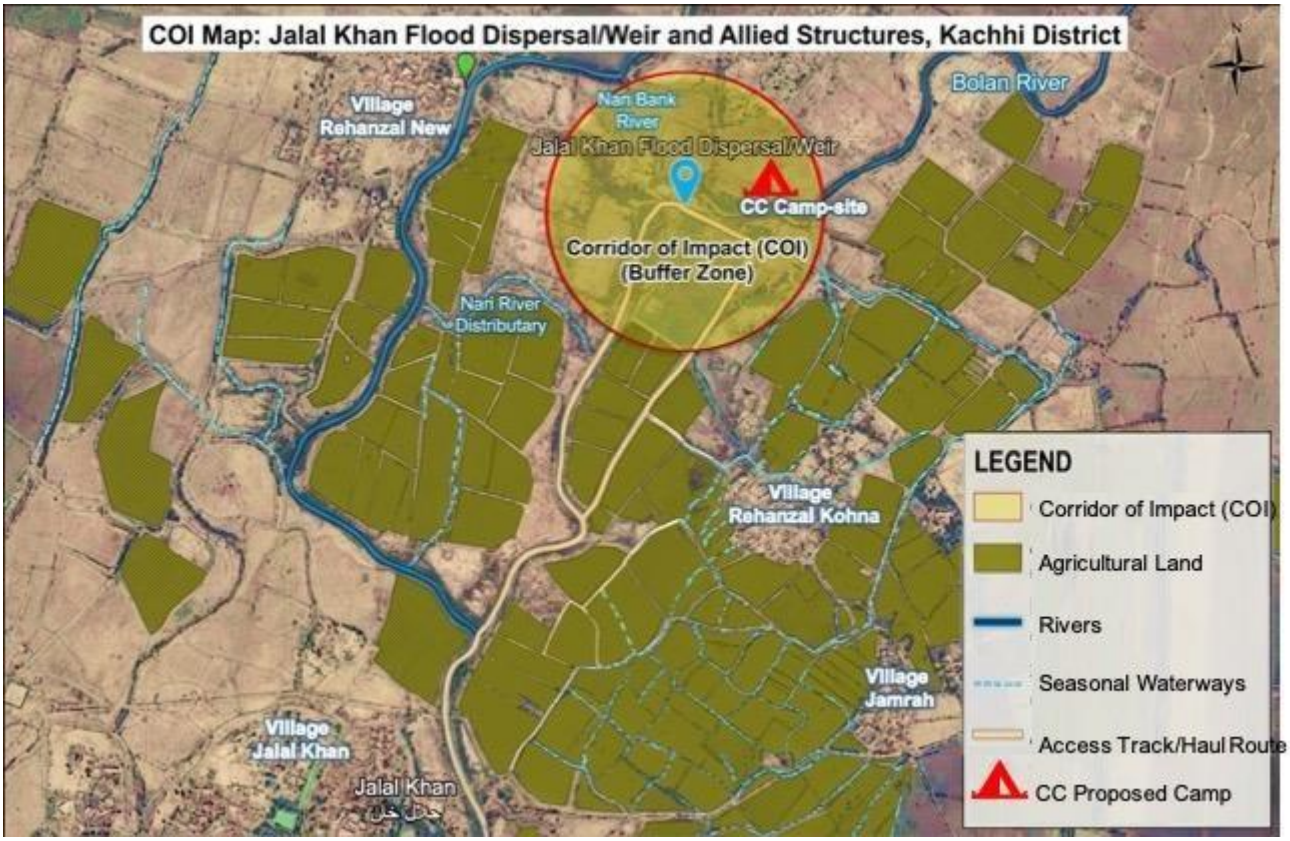


Figure 4-1: COI Map of Jalal Khan Dispersal/Weir and Allied Structure

The COI boundary encompasses four directly affected settlements (Rehanzai New, Rehanzai Kohna, Jamrah, and Jalal Khan) with a combined population of approximately 2,745 people in 305 households. The ESMP recognizes this 500-meter corridor as the **Area of Influence** for assessing both direct impacts (e.g., air quality, noise) and indirect effects (e.g., labor influx, traffic safety), thereby ensuring comprehensive coverage of safeguard requirements under the World Bank Environmental and Social Framework (ESF) and national environmental legislation.

4.2 Voluntary Land Donation (VLD) mechanism,

In total 60.68 acres of land has been donated by the local land owners for the construction two channels of Jalal Khan. All 60.68 acres of provided land will be used for the constructions of main channels. All permanent land has been donated from the farmers of Jalal Khan and land needs are met through the VLD process and as per the VLD framework of approved RPF process. The current land pattern of donated land is barren while the entire area is free from encroachment, and residential use, and is less than 10% of the total land available with the individual farmer. The list of farmers who have donated their land is provided in the table below;

Table 4-1: Land for the Flood Dispersal Structure at Killi Jalal Khan has been voluntarily donated by local farmers.

S. No	Name of Farmers	Father name	Total Land	Total Obtained Land in Acres (Hectors)	Percentage of total landholding Donated
1	Mir Amjid	Jalal Khan	230.6	4.9	5
2	Mir Zubair	Sardar Jalal Khan	90.5	2.9	6
3	Raees Khan	Hamza Khan	120.8	3.6	6
4	Ghulam Abbas	Gul Bahar	95.1	4.59	7
5	Khadim Hussain	Muhammad Sharif	87.8	9.5	7
6	Baji Khan	Din Muhd	250	7.85	6
7	Hazoor Bukhsh	Lal Jan	75	3.91	6
8	Lal Jan	Hazoor Bakhsh	65.7	2.51	3
9	Muhammad Bakhsh	Haji Hassan Khan	120	3.92	4
10	Abdul Nabi	Shamsheer Khan	97.7	6.50	3
11	Mehboob Ali	Ala Dina	25	2.31	7
12	Muhammad Hussain	Malak Haji Alam	61.0	2.00	7
13	Muhammad Khan	Lal Khan	55.5	4.5	6
14	Hussain Bakhsh	Muhd Hussain	20.9	2.09	5
Total				**60.68**	**5.2**

Source: VLD Documents, 2025-26. BWSPIP PIU-ID, January 2026.

Furthermore, three steps adopted for the acquired lands voluntarily from the farming communities through VLD process. First step was walk through surveys along with the channels to identify and scanned the affected lands at field level. The second step was meeting with representatives of the Revenue Departments to scan and verify these identified lands through the Cadastral Record. Similarly, third step was adopted for signing of agreements with the land owners. These were done in consultations meeting in presence of concerned office bearers of Farmer Organizations (FO)s and general communities. Total 60.8 acres of land has been acquired from the 14 land owners/farmers for construction of Flood Dispersal structure.

4.3 PHYSICAL ENVIRONMENT

4.3.1 Geography and Climate

The sub-project is located in District Kachhi, Balochistan, within a vast triangular alluvial plain (~5,682 km²) situated between the Kalat Mountains (west) and Bugti Hills (east). The sub-project site lies within a low-lying sedimentary basin at 85–120 masl, while the northern Mach tehsil rises to 2,200 masl through the Bolan Pass. The Kachhi Plain receives seasonal inflows from three ephemeral rivers, Nari, Talli, and Bolan, which are dry for most of the year but convey large sediment-laden floodflows during July–September. The plain's near-flat gradient (average slope < 0.006) causes poor natural drainage and high flood susceptibility, while deep alluvial soils offer significant agricultural potential under assured irrigation — the primary justification for the BWSPIP investment.

Table 4-2: Key Climate and Meteorological Parameters: Kachhi Plain / Jalal Khan Sub-Project Area

Meteorological Parameter	Value / Range	Source / Notes
Climate Classification	BWh — Hot Desert (Köppen-Geiger)	PMD-CDPC Normals (1961–1990, 1981–2010); BCCP 2024 (UNDP-GoB); Punjab University Geography Review, Vol.69(2), 2014
Annual Average Temperature	28–30°C	Long-term mean (1990–2020), PMD Sibi Station
Summer Maximum Temperature	48–52°C (May–June)	Sibi-Dhadar corridor among hottest globally; extreme OHS risk
Winter Minimum Temperature	3–8°C (Dec–Jan) plains; colder at elevation	Mild winters in plains; Mach-Bolan occasionally frost
Diurnal Temperature Range	15–25°C	Typical continental desert variability
Annual Precipitation (District)	150–200 mm	PMD Sibi/Jacobabad/Quetta stations (1990–2025)
Annual Precipitation (Sub-project site)	~80–100 mm	Hyper-arid micro-climate; highly variable inter-annually
Monsoon Rainfall (Jul–Aug)	60–80% of annual Total	High-intensity convective storms; primary flash flood trigger
Western Depression Rainfall (Jan–Mar)	20–30% of annual Total	Light-to-moderate prolonged rains; supports rabi cropping
Potential Evapotranspiration (PET)	2,000–2,500 mm/year	~10–15× annual rainfall; FAO Penman-Monteith method, PMD data
Aridity Index (P/PET)	0.06–0.10	Hyper-arid per UN Convention to Combat Desertification (UNCCD)
Relative Humidity	30–40% (annual average)	Extremely low; high worker dehydration risk
Mean Wind Speed	10–15 km/h	Frequent dust storms pre-monsoon (May–June)
Dominant Wind Direction	SW (monsoon); NW (winter)	Informs camp siting and spoil management orientation
Reference ET_0	6–8 mm/day (summer); 2–3 mm/day (winter)	FAO Penman-Monteith; PMD data
Growing Degree Days	>4,000 GDD/year	Sufficient thermal units for multiple cropping cycles if water available
Climate Change Projection	+2–3°C warming by 2050; intensified Monsoon	IPCC AR6; Pakistan National Climate Change Policy 2021; BCCP 2024

Sources: PMD-CDPC Climatic Normals 1961–1990, 1981–2010; Balochistan Climate Change Policy (BCCP) 2024; IPCC AR6, 2021; Köppen-Geiger Climate Classification; SES Laboratory Field Monitoring Data, January 2026.

Hydroclimatic Hazards and Contractor Obligations

The combination of extreme heat, hyper-aridity, and episodic high-intensity monsoon storms creates a regime of prolonged droughts punctuated by rapid-onset catastrophic flash floods. The Nari, Talli, and Bolan rivers can transition from dry channels to peak discharges exceeding 5,000 m³/s within hours, posing direct risk to construction works, labor camps, and surrounding communities. Climate projections under BCCP 2024 and IPCC AR6 indicate increasing frequency and intensity of both droughts and extreme flood events in the region.

These hydroclimatic extremes impose the following mandatory obligations on the Contractor, to be explicitly addressed in the Contractor's ESMP (C-ESMP), OHS Plan, and Emergency Response Plan (ERP):

Table 4-3: List of Hazards and required contractor measures

Hazard	Required Contractor Measure
Extreme heat (>48°C, May–Aug)	Heat stress protocol: no outdoor work 12:00–16:00; shaded rest areas; potable water ≥5 L/worker/day; heat illness training; climate-appropriate PPE (UV-protective clothing, insulated footwear)
Dust storms (May–Jun)	Dust suppression (water sprinkling, speed limits); dust respirators for workers; reduced earthworks during peak wind events
Flash floods (Jul–Sep)	Flash flood EWS linked to PMD alerts; defined evacuation routes; assembly points; stop-work triggers; monsoon-season construction scheduling with defined risk thresholds near watercourses
Low humidity / dehydration	Hydration stations at all work fronts; electrolyte supplements during peak summer; mandatory worker health checks

These requirements are consistent with ESS2 (Labor and Working Conditions), ESS4 (Community Health and Safety), WBG General EHS Guidelines, April 2007 (Sections 2.1 and 2.2), and the BWSPIP Labor Management Procedures (LMP).

4.3.2 Land and Water Resources

The Kachhi Plain is a hydro-agricultural basin where fertile alluvial soils coexist with extremely irregular water availability. Soils are predominantly alluvial silt and calcareous yermosols (sandy loam to silty clay), inherently fertile but prone to crusting and erosion without controlled moisture. Water resources at Jalal Khan derive from three sources summarized below:

Table 4-4: Water resources at Jalal Khan derive from three sources

Water Source	Description	Limitations
Spate Irrigation (Sailaba)	Seasonal flood-based irrigation from Nari, Talli, Bolan rivers; moisture stored in deep alluvial profile for subsequent cropping	Highly variable; vulnerable to flood damage and drought failure
Perennial Surface Water (Kachhi Canal)	Conveys Indus system flows to parts of district	Spatially uneven distribution; tail-end areas including portions of sub-project COI under-served

Groundwater	Limited availability; generally brackish with elevated TDS and chlorides above WHO thresholds	Microbiological contamination (total/fecal coliforms); not suitable as primary drinking source without treatment

Surface water from the Nari–Talli–Bolan system is generally **suitable for irrigation** and, with treatment (sedimentation, filtration, disinfection), for domestic use. Groundwater from the FD/W area shows **elevated TDS, chloride, and microbiological contamination** and shall not be used as a primary drinking water source for construction workers without full treatment.

ESMP Implications:

- Prioritize surface water for construction and camp needs where feasible
- Avoid unnecessary groundwater abstraction to prevent salinization and drawdown
- Protect surface water quality through strict erosion, sediment, and pollution controls during construction

4.3.3 Geology

The sub-project lies within the central Kachhi Plain, a structural trough at the junction of the Indian Plate and Afghan Block, infilled with thick Quaternary alluvial deposits. Key geological and geotechnical characteristics are summarized below:

Table 4-5: Geological and geotechnical characteristics

Feature	Description	ESMP Relevance
Surface soils	Silt loam to silty clay; strongly calcareous; Haplic Yermosols; low organic matter, high mineral content	Low permeability; high plasticity; prone to ponding when saturated; critical for embankment compaction and drainage design
Subsurface stratigraphy	Deep Quaternary alluvium (silt, clay, fine sand) overlying Paleogene–Neogene units (Nari Formation sandstones/shales; Ghazij Formation claystones)	Buried bedrock; no rock outcrops in project area
Hydrogeology	Brackish aquifer with paleo-marine sediments; temporary freshwater perched lenses post-flood near river channels	Groundwater not suitable for drinking without treatment; abstraction must be managed cautiously
Construction materials	Industrial clays, sand, and gravel from hill torrents available in area	Subject to borrow-area management and restoration as specified in this ESMP

4.3.4 Land Use and Soil Erosion

Land use in the sub-project area is controlled by seasonal flood cycles. The landscape is dynamic; productivity fluctuates with annual flood magnitude. Key land use categories and erosion processes are summarized below:

Land Use Categories:

Table 4-6: land use categories and erosion processes

Land Use	Description
Sailaba (flood-irrigated) Agriculture	Principal system; monsoon floods spread over fields; crops include wheat, oilseeds, sorghum, fodder; yields highly variable
Khushkaba (rain-fed / marginal) agriculture	Low-input, high-risk cultivation in areas receiving minimal flood or rainfall; frequent crop failures
Cultivable waste / Rangeland	Communal grazing for goats, sheep, and camels; primary livelihood asset for landless and smallholder households
Settlements and Infrastructure	Dispersed villages, katcha roads, existing bunds, and informal irrigation structures; highly flood-exposed

Soil Erosion Processes:

Table 4-7: Soil erosion, mechanism and impact

Erosion Type	Mechanism	Impact
Water erosion (flash floods)	High-velocity sheet and channel flows strip fertile topsoil; lateral bank erosion; channel cutting along Nari and Talli riverbanks	Loss of farmland; damage to irrigation intakes and existing bunds; channel instability
Wind erosion ("Loo")	Hot desiccating pre-monsoon winds (May–Jun) mobilize dry, unprotected silt and clay	Dust storms; declining soil depth; progressive desertification in unprotected areas

ESMP Implications: Embankments must not obstruct traditional flood-spreading patterns; borrow areas must be restored post-construction; spoil disposal must avoid creating new erosion hotspots; slope stabilization and vegetation buffers must be maintained on embankment faces.

4.3.5 Seismology

The sub-project lies within Seismic Zone 3 per the Building Code of Pakistan (BCP 2021), with a Peak Ground Acceleration (PGA) of 0.24–0.32 g. Three fault systems govern seismic risk:

Table 4-8: Fault systems govern seismic risks

Fault System	Description	Relevance
Mach Lineament / Fault	Passes through Mach area to the north; associated with destructive 1931 earthquake	Seismic energy propagates into Kachhi basin

Chaman Fault System	Major active strike-slip fault west of project area	Regional stress accumulation; periodic seismic events across Balochistan
Sulaiman–Kirthar Deformational Front	Complex fold-and-thrust zone at mountain-plain interface; hosts blind thrust faults beneath alluvial cover	Project area lies near deformational front foot

The FD/W is founded on **loose fine-grained alluvial sediments** susceptible to liquefaction and bearing capacity loss under strong shaking. The detailed engineering design has adopted seismic loading parameters consistent with BCP Zone 3, appropriate slope stability factors of safety, and compaction specifications to enhance embankment integrity.

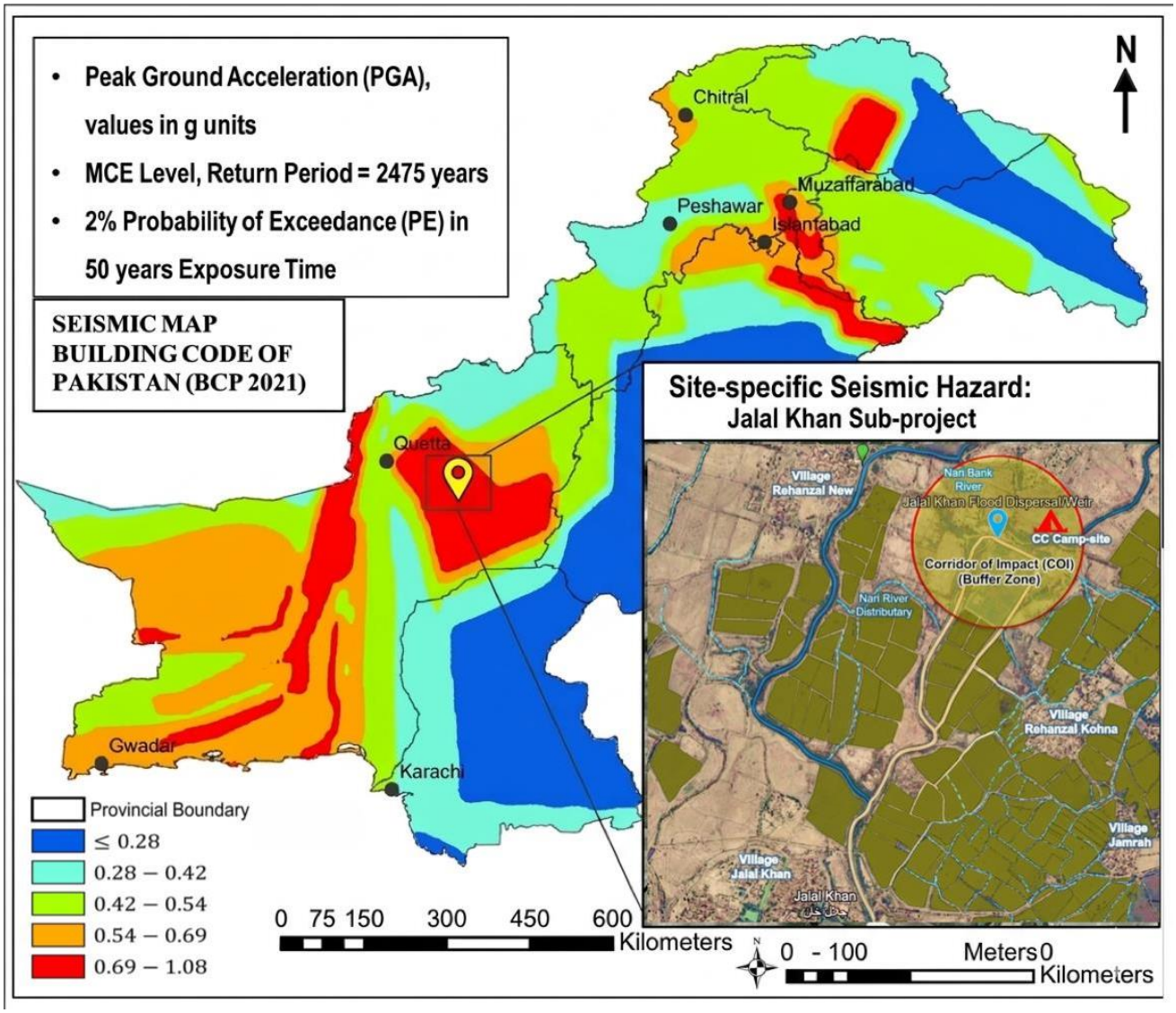


Figure 4-2: Seismic map showing the location of the sub-project area.

4.3.6 Hydrology

The sub-project lies within the Nari–Bolan catchment draining steep mountain ranges onto the Kachhi Plain. Key hydrological parameters are summarized below:

Table 4-9: Hydrological parameters Jalal Khan

Parameter	Value
Catchment Area	4,450 km²
Length of Longest Stream	219 km
Average Catchment Slope	0.0057 m/m
Design Flood Standard	100-year return period
Peak Design Discharge	Derived from updated rainfall-runoff modelling and historical flood records with climate-informed safety margins
Sediment Regime	High suspended and bed load (silt, sand, gravel) from Sulaiman and Kirthar ranges

Key hydrological characteristics:

- Ephemeral flash flood regime: Sparse vegetation and steep upstream slopes produce rapid runoff with very short concentration times and steep flood hydrograph rising limbs
- Sediment transport: Beneficial for soil fertility but causes aggradation, channel instability, and reduced conveyance if unmanaged in design
- Flood spreading: The FD/W must maintain or improve controlled flood spreading for downstream spate irrigation continuity

ESMP Implications:

- Borrow pits and construction footprints must not create new flood obstructions or concentrate flows unsafely
- Construction scheduling must avoid peak monsoon months (July–September) to protect workers and adjacent communities
- FD/W design preserves downstream spate irrigation functionality

4.3.7 Ambient Air Quality

Ambient air quality at the Jalal Khan sub-project area is generally good in the absence of significant industrial emission sources. However, the site is subject to **inherently elevated particulate loading** driven by the convergence of several site-specific physical and climatic conditions documented in earlier sections of this ESMP:

- **The hyper-arid BWh climate** (Section 4.2.1) with annual precipitation of only 80–100 mm creates persistent bare, dry, and unprotected soil surfaces highly susceptible to wind entrainment

- **Pre-monsoon Loo winds** (May–June) averaging 10–15 km/h with frequent dust storm episodes (Section 4.2.1) are the primary natural driver of elevated SPM, PM_{10}, and $PM_{2.5}$ concentrations in the area
- **Wind erosion of fine-grained silt and clay soils** (Haplic Yermosols, Section 4.2.3 and 4.2.4) with low cohesion when dry results in rapid dust mobilization during earthworks and vehicle movement
- **Seismic Zone 3 classification** (BCP 2021, Section 4.2.5) requires the Contractor to consider potential ground disturbance and soil liquefaction events that could temporarily generate localized elevated particulate loads, this must be addressed in the Emergency Response Plan (ERP)
- **Flash flood events** (Section 4.2.1 and 4.2.6) deposit fresh fine-grained alluvial sediments across the plain which, once dried, become a significant fugitive dust source during subsequent dry periods

These pre-existing and project-aggravated conditions collectively define the air quality risk profile for the sub-project and must be comprehensively addressed in the Contractor's ESMP (C-ESMP), OHS Plan, and Emergency Response Plan (ERP).

Relevant Standards

Ambient air quality is assessed against the following concurrent benchmarks:

- NEQS (Pakistan): National Environmental Quality Standards under the Pakistan Environmental Protection Act, 1997
- WHO Air Quality Guidelines (2021): Applied as international best-practice reference throughout this ESMP in compliance with WBG ESF requirements

Baseline Monitoring

A 24-hour continuous ambient air quality monitoring campaign was conducted on 23 January 2026 at Killi Jalal Khan, Bag Nari, District Kachi Bolan, using a calibrated 24-Hour Air Monitoring Station deployed by Sustainable Environmental Services (SES), Karachi (Lab Report No. SESENVJAN2631053995-A&B, dated 27 January 2026). Monitoring was conducted during January, the dry winter season, representing a relatively calm baseline period. Dust concentrations during pre-monsoon Loo wind season (May–June) and during active earthworks are expected to be substantially higher. The detailed hourly monitoring data (11:30 AM 23 Jan to 10:30 AM 24 Jan, 23 readings) are provided in Annexure [X]: Ambient Air Quality Monitoring Report (SES, January 2026). The 24-hour average results and comparison against Relevant standards are presented in Table 4-8 below.

Table 4-10: 24-Hour Ambient Air Quality Monitoring Results: Killi Jalal Khan, Bag Nari (23 January 2026)

Sr.	Parameter	Unit	WHO Limit (24-hr)	NEQS Limit	24-hr Average Result	Status

1	Oxide of Nitrogen (NO)	µg/m³	—	40	**6.66**	WL
2	Oxide of Nitrogen (NO_2)	µg/m³	25	80	**20.71**	WL
3	Sulphur Dioxide (SO_2)	µg/m³	40	120	**1.38**	WL
4	Carbon Monoxide (CO)	mg/m³	4 (24-hr)	5 (8-hr)	**0.013**	WL
5	Particulate Matter ($PM_{2.5}$)	µg/m³	15	35	**24.23**	WL / **WHO-EX**
6	Particulate Matter (PM_{10})	µg/m³	45	150	**39.23**	WL
7	Suspended Particulate Matter (SPM)	µg/m³	—	500	**63.45**	WL
8	Ozone (O_3)	µg/m³	60 (peak season)	130 (1-hr)	**05**	WL

WL = Within Limit; **WHO-EX** = Exceeds WHO Guideline (within NEQS); **OL** = Out of Limit
Source: SES Lab Report No. SESENVJAN2631053995-B, 27 January 2026. Instruments duly calibrated.
Detailed hourly data (23 readings, 11:30 AM–10:30 AM) provided in ***Annexure [H].***

Key Findings and Site-Specific Interpretation

Table 4-11: Baseline monitoring findings

Parameter	Finding	Site-Specific Context
$PM_{2.5}$ (24.23 µg/m³)	Within NEQS ; **exceeds WHO 15 µg/m³ guideline**	Baseline natural dust loading from hyper-arid soils and wind erosion (Sections 4.2.1, 4.2.4); will worsen significantly during Loo season and earthworks
PM_{10} (39.23 µg/m³)	Within all limits	Confirms naturally dusty character of dry Kachhi Plain in winter; pre-monsoon levels expected considerably higher
SPM (63.45 µg/m³)	Well within NEQS 500 µg/m³	Low in January; will rise sharply during May–June dust storms and active excavation
SO_2 (1.38 µg/m³)	Negligible	Confirms complete absence of industrial/combustion sources in project vicinity
CO (0.013 mg/m³)	Negligible	Consistent with very sparse traffic; will increase locally during construction plant operations
NO/NO_2	Within all limits	Minor contribution from regional road traffic; will increase during construction equipment operation
O_3 (05 µg/m³)	Well within all limits	Low baseline; intense summer heat (>48°C, Section 4.2.1) may drive photochemical O_3 formation during construction phase, monitor during summer months

Important Note: Baseline monitoring was conducted in January (winter), the most favorable season. The critical risk period is May–June when Loo winds, extreme heat (up to 52°C), low humidity (30–40%), and construction earthworks will combine to produce significantly elevated PM concentrations. Construction-phase monitoring must specifically target this period.

ESMP Requirements: Integrated Contractor Obligations

Given the convergence of natural climatic hazards (Sections 4.2.1–4.2.5) and construction-phase emission risks, the Contractor shall address the following in the C-ESMP, OHS Plan, and ERP, consistent with ESS2, ESS3, ESS4, and WBG General EHS Guidelines, April 2007 (Sections 1.1 and 2.1):

Table 4-12: C-ESMP, OHS Plan, and ERP

Hazard Source	Condition / Season	Required Contractor Measure
Earthworks dust (PM_{10}/$PM_{2.5}$/SPM)	Year-round; worst May–Jun	Water sprinkling on all haul roads minimum 2×/day; covering of all material transport trucks; speed limit ≤20 km/h on unpaved roads; immediate compaction of exposed surfaces
Pre-monsoon Loo dust storms	May–June (Section 4.2.1)	Suspend all earthworks during active dust storm events (wind >25 km/h with visible dust); reinstate only after conditions clear; pre-position dust screens at site boundaries
Extreme heat + dust combined	May–August (>48°C, Section 4.2.1)	No outdoor earthworks 12:00–16:00; mandatory shaded rest areas; potable water ≥5 L/worker/day; electrolyte supplements; heat illness first aid at all work fronts
Worker respiratory exposure	Earthworks and dust storm periods	FFP2-minimum dust respirators mandatory for all workers during excavation, compaction, and spoil handling; N95 respirators during extreme dust events
Exhaust emissions (NO_x/CO)	Construction plant operation	All machinery maintained to manufacturer specifications; no idling >5 minutes; Euro-II or higher emission standard vehicles where feasible
Post-flood fresh alluvial dust	Post-monsoon (Oct–Nov)	Stabilize freshly deposited alluvial sediments on exposed work areas using water sprinkling and temporary vegetation cover before resumed earthworks
Seismic event — dust generation	Any season (Section 4.2.5)	ERP to include protocol for increased dust monitoring and respiratory PPE deployment immediately following any seismic event causing ground disturbance at site
Community receptor protection	Year-round	Dust suppression barriers/screens at site boundaries adjacent to settlements; community complaint mechanism via GRM (Section [X]) for dust-related grievances
Construction-phase monitoring	Monthly minimum; weekly May–Jun	Monthly ambient air quality monitoring at downwind site boundary and nearest sensitive receptor; weekly during peak earthworks May–June; results in monthly EMRs to PDSC and PIU; exceedances trigger immediate corrective action protocol

Refer to Annexure [X] for full 24-hour hourly monitoring data (Report SESENVJAN2631053995-A, SES, 27 January 2026), Section 5 (ESMP Mitigation Matrix) for complete air quality management measures, and Section 4.2.1 for climate and hydroclimatic hazard context.

4.3.8 Noise Level

Baseline noise conditions at the Jalal Khan sub-project area are characteristic of a quiet, low-density rural environment with no proximate industrial noise sources. Background noise is dominated by natural ambient sounds including wind, livestock movement, and occasional light traffic on local katcha roads. The acoustic sensitivity of this environment is further shaped by the following site-specific conditions documented in earlier sections of this ESMP:

- The hyper-arid BWh climate with strong pre-monsoon Loo winds (Section 4.2.1) can temporarily elevate ambient background noise levels naturally during May–June dust storm events, masking construction noise but also increasing worker exposure to combined wind-dust-noise hazards
- Extreme summer temperatures exceeding 48°C (Section 4.2.1) require construction scheduling restrictions (no outdoor work 12:00–16:00), which directly affect which hours high-noise equipment may operate
- Flash flood risk during monsoon season (Sections 4.2.1 and 4.2.6) restricts construction to October–May, concentrating all high-noise activities within this window and requiring noise management to be most rigorous during this period
- Seismic Zone 3 classification (Section 4.2.5) means heavy compaction equipment and vibro-compactors used on the FD/W embankment generate both noise and ground vibration — both must be addressed in the C-ESMP, OHS Plan, and ERP with specific vibration monitoring near the bund and any adjacent structures

Relevant Standards

Noise levels are assessed against the following concurrent benchmarks:

- NEQS (Pakistan): National Environmental Quality Standards, Pakistan EPA, under Pakistan Environmental Protection Act, 1997
- WHO Environmental Noise Guidelines for the European Region (2018): Applied as international best-practice reference per WBG ESF requirements; day limit 65 dB(A); night limit 55 dB(A) for residential/rural settings

Baseline Monitoring

A 24-hour continuous noise monitoring campaign was conducted on 23 January 2026 at Killi Jalal Khan, Bag Nari, District Kachi Bolan, using a calibrated Noise Meter deployed by Sustainable Environmental Services (SES), Karachi (Lab Report No. SESENVJAN2631053995-E, dated 27 January 2026). The detailed 24-hour hourly

monitoring data are provided in Annexure [H]: Noise Level Monitoring Report (SES, January 2026).

The monitoring period covered three recognized time bands per NEQS/WHO classifications, Daytime (10:00 AM–09:00 PM), Night-time (10:00 PM–06:00 AM), and Early Morning Day (07:00 AM–09:00 AM), as presented in Table 4-5 below.

Table 4-13: 24-Hour Noise Level Monitoring Results: Killi Jalal Khan, Bag Nari (23 January 2026)

Sr.	Time	Period	Result dB(A)	WHO Limit dB(A)	NEQS Limit dB(A)	Status
1	10:00 AM	Daytime	61.3	65	75	WL
2	11:00 AM	Daytime	63.8	65	75	WL
3	12:00 PM	Daytime	62.4	65	75	WL
4	01:00 PM	Daytime	65.7	65	75	**WHO-EX**
5	02:00 PM	Daytime	64.1	65	75	WL
6	03:00 PM	Daytime	62.7	65	75	WL
7	04:00 PM	Daytime	59.8	65	75	WL
8	05:00 PM	Daytime	63.6	65	75	WL
9	06:00 PM	Daytime	64.8	65	75	WL
10	07:00 PM	Daytime	61.9	65	75	WL
11	08:00 PM	Daytime	59.3	65	75	WL
12	09:00 PM	Daytime	**58.2** *(corrected from 58.9 in draft)*	65	75	WL
13	10:00 PM	Night-time	58.2	55	65	**WHO-EX**
14	11:00 PM	Night-time	46.8	55	65	WL
15	12:00 AM	Night-time	48.3	55	65	WL
16	01:00 AM	Night-time	49.7	55	65	WL
17	02:00 AM	Night-time	50.8	55	65	WL
18	03:00 AM	Night-time	52.3	55	65	WL
19	04:00 AM	Night-time	55.1	55	65	**Borderline-WHO**
20	05:00 AM	Night-time	47.4	55	65	WL
21	06:00 AM	Night-time	52.5	55	65	WL
22	07:00 AM	Early Morning	53.6	65	75	WL
23	08:00 AM	Early Morning	54.7	65	75	WL
24	09:00 AM	Early Morning	55.3	65	75	WL
—	**24-hr Average**	**All periods**	**55.58**	65 (day) / 55 (night)	75 (day) / 65 (night)	**WL (NEQS)**

***WL** = Within Limit; **WHO-EX** = Marginally Exceeds WHO Guideline (within NEQS);*

***Borderline-WHO**=At WHO threshold Source: SES Lab Report No. SESENVJAN2631053995-E, 27 January 2026. Instrument duly calibrated. Full 24-hour hourly data provided in Annexure [H].*

Key Findings Assessment

Table 4-14: NEQS Readings

Finding	Detail	Implication
All readings within NEQS	All 24 readings within NEQS day (75) and night (65) dB(A) limits	**Confirmed compliant with national standards**
01:00 PM reading (65.7 dB(A))	Marginally exceeds WHO daytime guideline of 65 dB(A) by 0.7 dB	Likely natural ambient peak from wind/livestock; within measurement uncertainty range, **not a concern at baseline**
10:00 PM reading (58.2 dB(A))	Exceeds WHO night-time guideline of 55 dB(A) by 3.2 dB	Likely transition from evening activity; within NEQS limit of 65, **flag for night construction restriction**
04:00 AM reading (55.1 dB(A))	At WHO night threshold of 55 dB(A)	Natural ambient; confirms sensitivity of night acoustic environment, **no night construction near settlements**
24-hr average (55.58 dB(A))	Equals WHO daytime guideline of 55 dB(A) for sensitive areas	Confirms naturally quiet baseline; **any construction noise addition will be readily perceptible**
Monitoring season	January (dry winter), calm wind conditions	Pre-monsoon Loo wind season (May–June) will raise natural background; construction noise will still dominate during active works

Overall Compliance Statement: All 24-hourly readings are within Relevant NEQS limits. Two readings marginally exceed WHO guidelines (01:00 PM daytime by 0.7 dB; 10:00 PM night-time by 3.2 dB) under natural baseline conditions without any construction activity. These marginal exceedances at baseline confirm the acoustic sensitivity of the site and reinforce the need for strict noise management during construction, particularly for night-time and early morning operations.

ESMP Requirements: Integrated Contractor Obligations

Given the acoustic sensitivity of the baseline environment, site-specific climatic and seismic hazards (Sections 4.2.1–4.2.5), and the WHO guideline marginal exceedances even at natural baseline, the Contractor shall address the following in the C-ESMP, OHS Plan, and ERP, consistent with ESS2, ESS4, and WBG General EHS Guidelines April 2007 (Section 1.5 — Noise):

Table 4-15: Hazard source, season and measure required by the contractor

Hazard / Source	Condition / Season	Required Contractor Measure

High-noise earthworks (excavators, bulldozers, loaders)	Oct–May construction window	Restrict to daytime hours only (07:00–19:00); no high-noise operations within 500m of settlements during night-time (19:00–07:00)
Extreme heat scheduling conflict	May–August (>48°C, Section 4.2.1)	No outdoor work 12:00–16:00; adjust high-noise activity windows to 07:00–12:00 and 16:00–19:00 during summer months
Compaction machinery and vibro-compactors	FD/W embankment construction	Monitor both noise AND ground vibration near bund and adjacent structures; vibration limits per WBG EHS Guidelines Section 1.5; address in ERP per seismic context (Section 4.2.5)
Generators and fixed plant at camp	24-hour operation	Site ≥200m from nearest dwelling; acoustic enclosures mandatory; automatic shut-off during night if not operationally essential
Material transport trucks	Year-round haul	Engine mufflers maintained; no horn use near settlements; speed limit ≤20 km/h through any residential area
Equipment maintenance	All construction plant	All equipment fitted with manufacturer-specified mufflers; defective silencers repaired within 24 hours of identification; no use of equipment with noise levels exceeding WBG EHS limits
Pre-monsoon Loo wind season	May–June (Section 4.2.1)	Combined wind-dust-noise conditions increase worker acoustic and respiratory exposure; mandatory hearing protection (ear defenders/plugs) AND dust respirators simultaneously during this period
Seismic event response	Any season (Section 4.2.5)	ERP to include protocol for immediate suspension of all vibration-generating equipment following any seismic event; structural inspection of bund and camp before resumption
Community notification	All high-noise activity phases	Notify affected communities minimum 48 hours before commencement of particularly noisy operations; GRM (Section [X]) available for noise complaints
Construction-phase monitoring	Monthly minimum; weekly during peak earthworks	Monthly noise monitoring at nearest settlement boundary and sensitive receptor; results in monthly EMRs to PDSC and PIU; any reading exceeding NEQS triggers immediate corrective action; WHO exceedances reported with explanation and mitigation response

Refer to Annexure [H] for full 24-hour hourly noise monitoring data (Report SESENVJAN2631053995-E, SES, 27 January 2026), Section 5 (ESMP Mitigation Matrix) for

complete noise management measures, and Sections 4.2.1 and 4.2.5 for climate and seismic hazard context.

4.3.9 Water Quality

Water quality at the Jalal Khan sub-project area reflects the broader hydro-geological character of the Kachhi Plain documented in Sections 4.2.2 and 4.2.3, a distinct contrast between relatively acceptable surface water from the ephemeral river system and brackish, partially contaminated groundwater from the central plain aquifer. This contrast has direct implications for construction-phase water supply, worker health and safety, and community protection under **ESS2, ESS3, and ESS4**.

The following site-specific conditions from earlier sections further define the water quality risk context:

- **Hyper-arid climate (Section 4.2.1):** Extreme evapotranspiration (2,000–2,500 mm/year) concentrates dissolved salts in shallow groundwater, compounding natural brackishness
- **Fine-grained alluvial geology (Section 4.2.3):** Low-permeability silty clay soils limit natural groundwater recharge but also concentrate contaminants; paleo-marine sediments contribute to elevated TDS, chlorides, and heavy metals including cadmium and lead in groundwater
- **Flash flood hydrology (Section 4.2.6):** High-velocity monsoon floods carry substantial suspended sediment and microbiological load into surface water; post-flood surface water is turbid but nutrient-rich and generally acceptable for irrigation
- **Seismic Zone 3 (Section 4.2.5):** Seismic events can disturb shallow aquifers and temporarily alter groundwater quality, this must be addressed in the ERP

Relevant Standards

Water quality results are assessed against the following concurrent benchmarks:

- **NEQS (Pakistan):** National Environmental Quality Standards: Drinking Water and Surface Water, Pakistan EPA under Pakistan Environmental Protection Act, 1997
- **WHO Guidelines for Drinking-Water Quality, 4th Edition (2017):** Applied as international best-practice reference per WBG ESF requirements

Baseline Monitoring

Water quality baseline sampling was conducted on 23 January 2026 at Rehanzai/Jalal Khan by Sustainable Environmental Services (SES), Karachi (Lab Report No. SESENVJAN2631053995-C&D, dated 27 January 2026). Grab samples of 1.0 litre each were collected and subjected to full chemical and microbiological analysis. Detailed

laboratory results are provided in Annexure [H]: Water Quality Analysis Reports (SES, January 2026). Two sample types were analyzed:

- **Report C (SESENVJAN2631053995-C):** Surface water — 32 parameters
- **Report D (SESENVJAN2631053995-D):** Groundwater — 32 parameters

4.3.10 Surface Water Quality

Surface water from the Nari–Talli–Bolan river system at Jalal Khan is the primary water source for irrigation and, after treatment, domestic use across the sub-project command area. January sampling represents low-flow / inter-flood conditions, surface water quality during monsoon flood events will have significantly higher turbidity and microbiological load due to sediment entrainment and open-country runoff.

Table 4-16: Surface Water Quality Analysis: Rehanzai/Jalal Khan (23 January 2026) (Report No. SESENVJAN2631053995-C, SES — Grab Sample, 1.0 L)

Sr.	Parameter	Unit	Testing Method	NEQS Limit	WHO Limit	Result	Status
1	Total Bacteria Count (TBC)	count/ml	Total Viable Count	—	—	9	—
2	Total Coliform (TC)	count/100ml	APHA 922B	0/100ml	0/100ml	**204**	**OL**
3	E-Coli (EC)	count/100ml	Total Viable Count	0/100ml	0/100ml	**144**	**OL**
4	Fecal Coliform (FC)	count/100ml	APHA 922B	0/100ml	0/100ml	**70**	**OL**
5	Turbidity	NTU	HACH Turbidity Meter	≤5	≤15	0.08	WL
6	Taste	—	Sensory Evaluation	Non-obj	Non-obj	Non-obj	WL
7	Odour	—	Sensory Evaluation	Non-obj	Non-obj	Non-obj	WL
8	Colour	TCU	Pt-Co Method	≤15	≤15	3	WL
9	Phenolic Compounds	mg/L	ASTM D-1783	—	—	ND	WL
10	Residual Chlorine	mg/L	HACH Method 8167	0.2–0.5	—	0.4	WL
11	pH @ 25°C	—	ASTM D-1293	6.5–8.5	6.5–8.5	8.16	WL
12	Total Dissolved Solids (TDS)	mg/L	APHA 2540-C	≤1000	≤1000	335	WL
13	Total Hardness (as $CaCO_3$)	mg/L	APHA 2340-C	≤500	—	91	WL
14	Fluoride (F^-)	mg/L	APHA 4500-F	≤1.5	1.5	0.74	WL
15	Chloride (Cl^-)	mg/L	APHA 4500-Cl	≤250	250	131	WL

16	Cyanide (CN^-)	mg/L	HACH Method 8027	≤0.05	0.07	ND	WL
17	Nitrate (NO_3^-)	mg/L	HACH Method 8192	≤50	50	0.25	WL
18	Nitrite (NO_2^-)	mg/L	APHA 4500-NO-B	≤3.0	3	0.04	WL
19	Antimony (Sb)	mg/L	ASTM D-3697	≤0.005	0.02	ND	WL
20	Aluminum (Al)	mg/L	ASTM D-857	≤0.2	0.2	0.10	WL
21	Arsenic (As)	mg/L	ASTM D-2972	≤0.05	0.01	ND	WL
22	Boron (B)	mg/L	ASTM D-3082	0.3	0.3	ND	WL
23	Barium (Ba)	mg/L	ASTM D-4382	0.7	0.7	0.007	WL
24	Chromium Total (Cr)	mg/L	ASTM D-1687	≤0.05	0.05	ND	WL
25	Copper (Cu)	mg/L	ASTM D-1688	2	2	0.07	WL
26	Cadmium (Cd)	mg/L	ASTM D-3557	0.01	0.003	ND	WL
27	Lead (Pb)	mg/L	ASTM D-3559	≤0.05	0.01	ND	WL
28	Manganese (Mn)	mg/L	ASTM D-858	≤0.5	0.5	ND	WL
29	Mercury (Hg)	mg/L	ASTM D-3223	≤0.001	0.001	ND	WL
30	Nickel (Ni)	mg/L	ASTM D-3866	≤0.02	0.02	ND	WL
31	Selenium (Se)	mg/L	ASTM D-3858	0.01	0.01	ND	WL
32	Zinc (Zn)	mg/L	ASTM D-1691	5	3	1.2	WL

WL = Within Limit; **OL** = Out of Limit (exceeds all Relevant standards); **ND** = Not Detected *Source: SES Lab Report No. SESENVJAN2631053995-C, 27 January 2026. Full report in* ***Annexure [H].***

Surface Water Key Findings:

Table 4-17: Surface water findings and implications

Finding	Detail	Implication
Microbiological contamination — OL	Total Coliform 204, E-Coli 144, Fecal Coliform 70 count/100ml, all exceed 0/100ml limit under NEQS and WHO	Surface water **must not be used for drinking without full treatment** (sedimentation + filtration + disinfection); mandatory for construction worker camp water supply
Physico-chemical parameters	All 29 non-microbiological parameters within NEQS, and WHO limits	Surface water **suitable for irrigation** and construction uses (dust suppression, compaction)
TDS (335 mg/L)	Well within NEQS/WHO 1000 mg/L limit	Confirms low salinity, good quality for spate irrigation
pH (8.16)	Within 6.5–8.5 range	Slightly alkaline, typical of calcareous alluvial system
Turbidity (0.08 NTU)	Well within all limits at low-flow Season	Will increase significantly during monsoon flood events

Heavy metals	All ND or well within limits	No heavy metal contamination in surface water at baseline

4.3.11 Groundwater Quality

Groundwater in the central Kachhi Plain is widely recognized as brackish due to paleo-marine sediment influence (Section 4.2.3). The January 2026 sampling confirms this characterization and **additionally identifies two critical heavy metal exceedances** that were **not reported in the original ESMP draft** and which have significant implications for worker health, domestic water use, and ESS3 compliance.

Table 4-18: Groundwater Quality Analysis: Rehanzai/Jalal Khan (23 January 2026) (Report No. SESENVJAN2631053995-D, SES — Grab Sample, 1.0 L)

Sr.	Parameter	Unit	Testing Method	NEQS/WHO Limit	Result	Status
1	Temperature @ 40°C	°C	Calibrated Thermometer	40 ±3°C	**33.1**	WL
2	pH @ 25°C	—	ASTM D-1293	6–9	**7.30**	WL
3	BOD_5	mg/L	APHA 5210	80	**65.5**	WL
4	COD	mg/L	ASTM D-1252	150	**131**	WL
5	Total Dissolved Solids (TDS)	mg/L	APHA 2540-C	3500	**1921**	WL
6	Total Suspended Solids (TSS)	mg/L	APHA 2540-D	200	**111.7**	WL
7	Oil & Grease	mg/L	ASTM D-4281	10	**0.04**	WL
8	Chloride (Cl^-)	mg/L	ASTM D-512	1000	**515**	WL
9	Phenolic Compound	mg/L	ASTM D-1783	0.3	**ND**	WL
10	Fluoride (F^-)	mg/L	APHA 4500-F	10	**4.1**	WL
11	Anionic Detergent	mg/L	ASTM D-6173	20	**5.1**	WL

4.4 ECOLOGICAL ENVIRONMENT

The ecological environment of the Kachhi Plain—particularly the Nari, Talli and Bolan basins—represents a delicate balance between a hyper-arid desert landscape and a highly productive flood-pulse ecosystem. Under BWSPIP, environmental management focuses on conserving this unique biodiversity while mitigating impacts from flood protection and related water-sector infrastructure.

4.4.1 Flora and Vegetation

Vegetation in Jalal Khan and surrounding plains is classified as **Tropical Thorn Forest and Desert Scrub**, dominated by drought-resistant xerophytic trees and shrubs adapted to extreme heat, low rainfall and high evapotranspiration. Key native species include:



- **Prosopis cineraria (Kandi/Jhang):** A keystone multipurpose tree used for fodder, shade and fuelwood, with nitrogen-fixing capacity that enhances soil fertility in agro-pastoral systems.
- **Acacia nilotica (Kikar):** Common along riverbanks, canals and low-lying areas, stabilizing banks and providing timber, fuelwood and shade for livestock and people.
- **Ziziphus mauritiana (Ber):** Important for its edible fruit, browse value and role as habitat for small birds and insects.
- **Salvadora oleoides (Khabar):** A salt-tolerant shrub/tree occurring in more saline patches, valued locally for medicinal uses and as a fuelwood source.



Ground cover consists mainly of ephemeral grasses and forbs that appear after monsoon floods or winter rains, providing short-term grazing for livestock. Vegetative cover is generally sparse in non-flood years, increasing vulnerability to wind erosion (Loo) and dust storms.

An ecologically significant issue is the spread of **Prosopis juliflora** (invasive mesquite, “devil’s tree”), which has colonized large areas of the Kachhi Plain. Although it offers fuelwood and limited fodder, it competes with native species, forms dense thickets that restrict access, and can lower shallow groundwater levels, potentially undermining BWSPIP water security and ecological objectives.

4.4.2 Fauna

Despite harsh climatic conditions, the Kachhi Plain supports a resilient assemblage of wildlife, some of which is protected under the Balochistan Wildlife Preservation, Protection, Conservation and Management Act, 2014. Typical fauna in and around the sub-project COI includes:

- **Mammals:**
  - *Gazella bennettii* (Chinkara/Indian gazelle) in open scrub and piedmont zones.
  - Predators such as Asiatic jackal (*Canis aureus*), desert fox (*Vulpes vulpes pusilla*) and the rare striped hyena (*Hyaena hyaena*).
  - Small mammals including Cape hare (*Lepus capensis*) and Indian porcupine (*Hystrix indica*) commonly associated with agricultural fields.
- **Birds:**
  The district lies on an important migratory bird corridor. The **houbara bustard** (provincial flagship species) occasionally winters on the dry plains, while resident birds include grey francolin (*Francolinus pondicerianus*), larks, doves, bee-eaters and various raptors (eagles and falcons) that hunt over open farmland and scrub.
- **Reptiles:**
  Reptile fauna includes the spiny-tailed lizard (*Uromastyx hardwickii*, locally *sanda*),

agamid lizards and several desert snakes, notably the saw-scaled viper (*Echis carinatus*).

No **national parks, wildlife sanctuaries or other legally notified protected areas** occur within or immediately adjacent to the Jalal Khan FD/W COI. There are also no identified critical habitats as defined by ESS6; however, several habitat features are of local ecological significance:

- **Riparian corridors:** Seasonal channels and floodplains of the Nari and Talli rivers form linear "green ribbons" with denser woody vegetation, providing key breeding and foraging habitat for birds, small mammals and reptiles.
- **Spate-irrigated agro-ecosystems:** Flood-recharged agricultural fields function as man-made ecosystems that attract insects, granivorous birds and small mammals, forming an important interface between livelihoods and biodiversity.

These habitat considerations inform the siting of borrow areas, access tracks, camps and spoil disposal sites, and underpin biodiversity-related mitigation measures in Chapter 6 and Table 7-2.

4.5 SOCIO-ECONOMIC BASELINE

4.5.1 Agriculture, Irrigation, WASH, and Rural Livelihoods

The Kachhi Plain economy runs on spate irrigation. Farmers in the project villages depend almost entirely on seasonal flood flows from the Nari, Talli, and Bolan rivers. When floods arrive in July–August, water is diverted by traditional bunds and spread over fields for wheat, oilseeds, sorghum, and fodder crops under the sailaba system. In drought years or when the dispersal structure fails, entire cropping seasons are lost. Average seasonal earnings per acre and estimated annual farming expenditure per acre are shown in Tables 4-31 and 4-32 respectively.

Land use is dominated by sailaba agriculture, supplemented by khushkaba (rainfed) cultivation on marginal ground and communal rangeland grazing. Livestock, particularly goats, sheep, and camels, is the main fallback livelihood for landless and smallholder households. There is no formal off-farm employment in the immediate project area. Most households depend on a single income source, making them highly vulnerable to flood-related crop failure.

Access to safe drinking water is a serious challenge. Communities rely on private tube wells operated by solar pumps, with water transported manually by donkeys. There is no piped water supply in any of the four project villages. Sanitation infrastructure is absent. Open defecation is the norm across all four villages. This baseline confirms the direct and positive WASH and livelihood benefits that the subproject is designed to deliver, and it justifies the

ESS4 and ESS6 protections embedded in this ESMP. For further context on baseline livelihoods, refer to the BWSPIP Project Appraisal Document (PAD).

4.5.2 General

The socio-economic baseline provides a systematic assessment of the existing social and economic conditions within the project area and serves as a benchmark for evaluating future changes and potential impacts. It supports the identification of community vulnerabilities, the design of mitigation measures, and the equitable distribution of project benefits, while enabling effective monitoring over time.

As part of the ESMP preparation, a detailed socio-economic baseline study was conducted for the Rehanzai / Jalal Khan Flood Dispersal (weir) and allied structures in the Jalal Khan area of the Nari River Basin. The study documented the prevailing demographic profile, livelihood patterns, and infrastructure conditions within the project's area of influence.

A total of 45 respondents were consulted, including 23 male household members, 12 female household members, and 10 individuals from vulnerable groups. Consultations were conducted separately to ensure inclusivity and accurate representation. The sample represents approximately 14.75% of the respondents

In total, 45 households were surveyed out of 305 households in the project area which is 14.75 % of the total households, with an estimated population of approximately 2,745. Details of the consulted communities and nearby villages are provided in the table below.

4.5.3 Age of Respondents (Male and Female)

The male and female respondents for the socioeconomic baseline survey are classified in accordance with the age groups as detailed in the table below.

Male: The survey reveals that 13.04% of respondents are between 21-30 years, 34.78% are between 31-40 years, 26.09% are between 41-50 years, and 17.39% are between 51-60 years of age.

Female: The survey reveals that 13.64% are between 21-30 years, 36.36% are between 31-40 years, 31.82% are between 41-50 years, and 18.18% are between 51-60 years of age.

Table 4-19: Age of Respondent

Responds' Age	Rehanzai New, Rehanzai Kohna,Jamra & Jalal Khan
No out of 23 Male Respondents	
< 20	0
21- 30	03
31- 40	08
41 – 50	06
51 – 60	04
61 – 70	01
70 and above	1
No out of 22 Female Respondents	
< 20	0
21- 30	03
31- 40	08
41 – 50	07
51 – 60	04
61 – 70	0
70 and above	0

Source: Socio-economic survey by PIU team

4.5.4 Religion

The total (100%) of the population is Muslim.

4.5.5 Respondent's Relationship with Head of Household

During the survey, 68.58% of the respondents or heads of households including (14.29% females) were personally available for an interview, 5.71% of the respondent were brothers, 5.71% were sons and 20% were wives.

4.5.6 Education Level of Respondents

Male: The socio-economic baseline survey revealed that 60.87% of the respondents were uneducated, 21.74% have a primary level of education, 8.70% have completed secondary education (Matric) and 4.35% education have higher secondary school qualification (Intermediate).

Female: The socioeconomic baseline survey revealed that 77.27% of the respondents were uneducated, 13.64% have a primary level of education, 9.09% have completed secondary education (Matric) only. The details of male and female respondents are illustrated in the following table.

Table 4-20: Education Level

Education Levels	Rehanzai New, Rehanzai Kohna,Jamra & Jalal Khan
No out of 23 Male Respondents	
Un-educated	14
Primary (up to 5 Years)	05
Secondary (up to 10 years)	02
High Secondary School (up to 12 Years)	01
University	1
No out of 22 Female Respondents	
Un-educated	17
Primary (up to 5 Years)	03
Secondary (up to 10 years)	02
High Secondary School (up to 12 Years)	0
University	0

Source: Socio-economic survey by PIU team

4.5.7 Family Size

The survey data revealed that the family size of 44% of households have between 1-5 persons; a significant majority 73% of households have between 5-10 persons; and 20% of households have between 10-15 persons, as provided in Table ---:

Table 4-21: Average Family Size

Family Size	Rehanzai New, Rehanzai Kohna,Jamra & Jalal Khan
1 to 5	10.0
5 to 10	29.2
10 to 15	24.7
15 & above	36.0

Source: Socio-economic survey by PIU team

4.5.8 Family System

Approximately 88% of households in the project area live in joint family arrangements, while 12% follow a nuclear family structure. The predominance of joint families reflects traditional socio-cultural norms and has important implications for resource sharing, decision-making, and vulnerability dynamics.

In joint households, the eldest male member typically holds primary authority over economic and social decisions, particularly those related to external engagements and community affairs. While this structure can limit individual agency—especially for women—it also provides an internal support system that enhances household resilience.

The joint family system serves as an informal social protection mechanism, enabling risk-sharing and collective coping during periods of economic stress, unemployment, or climate-related shocks. This arrangement is particularly significant for vulnerable groups, including women, the elderly, orphans, and persons who are ill or unable to work, as it ensures access to basic needs and care through pooled household resources.

From an economic perspective, joint families are perceived as more efficient, as members often engage collectively in livelihood activities—particularly agriculture and livestock

rearing—and share income and expenditures. This collective approach helps buffer income variability and reduces exposure to extreme poverty at the household level.

However, the structure may also reinforce existing gender and social hierarchies, potentially limiting equitable access to resources and decision-making for certain groups. These dynamics are relevant for ESMP implementation, particularly in ensuring inclusive participation and equitable benefit-sharing.

The distribution of family arrangements (joint and nuclear) is presented in the table below.

Table 4-22: Family System

Family System	Rehanzai New, Rehanzai Kohna,Jamra & Jalal Khan (In %)
Joint	88
Nuclear (Single)	12

Source: Socio-economic survey by PIU team

4.5.9 Marriage

Data from the below table shows that residents of the scheme area prefer marriages within families. The trend of marriage outside of the family but within the same tribe is also increasing. The percentage of marriages inside and outside of the families is presented in Table 33.

Table 4-23: Marriages

Marriage System	Rehanzai New, Rehanzai Kohna,Jamra & Jalal Khan (In %)
Outside family marriage	30%
Inside family marriage	70%

Source: Socio-economic survey by PIU team

4.5.10 Short Profile of Jalal Khan Weir / Dispersal Structure and Sensitive Receptors

The Jalal Khan Flood dispersal/weir structure directly serves four villages clustered near the Nari–Bolan confluence.

The map in Figure 4-3 shows the dispersal structure alignment and the location of nearby settlements. No sensitive receptor was found in the proposed sub project area.

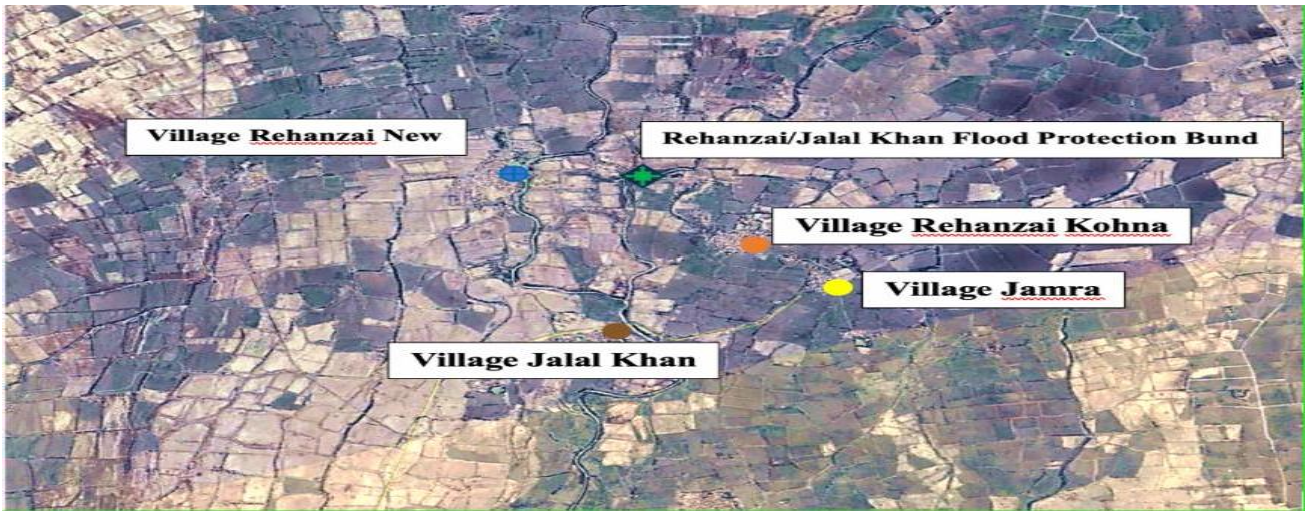


Figure 4-3: Map of project site and villages

Table 4-24: Distances of the villages near the proposed project area

Sr. No	Village	Distance from FD/W
1	Rehanzai New	1.145 km
2	Rehanzai Kohna	1.59 km
3	Jamra	2.42 km
4	Jalal Khan	4.91 km

Source: Socio-economic survey by PIU team

All four settlements lie within the flood impact zone and will directly benefit from improved flood protection.

4.5.11 Household & Population Information

The socio-economic baseline survey reveals that due to proposed sub-project the positive impact will be expected on the overall population of entire command area Jalal Khan village of 04 sub-settlements. The details of households and its population villages wise are illustrated below:

Table 4-25: Number of households and total population

Sr. No	Village	Households	Population
1	Rehanzai New	175	1575
2	Rehanzai Kohna	110	990
3	Jamra	15	135
4	Jalal Khan	5	45
	Total	**305**	**2,745**

Source: Socio-economic survey by PIU team

4.5.12 Education Facilities

Educational services in the sub-project area is limited and mostly confined to the primary and middle levels. There are three boys' primary schools, one girl's primary school and two boys' middle schools; there is no high school, college or university within the immediate area.

Enrolment is relatively higher at primary level but declines sharply by middle and matric levels, with some children remaining out of school due to distance, costs and engagement in child labor. Communities highlighted poor physical conditions of schools, weak teaching quality and the absence of a local girls' high school, which forces families to send children to Bhag (≈20 km away) when they can afford transport, while many others cannot.

Table 4-26: Education Facilities in the Project Villages

Gender	Primary	Middle	High	College	University
Boys	3	2	–	–	–
Girls	1	–	–	–	–

Source: Socio-economic survey by PIU team

4.5.13 Health Facilities and Health Problems

Health infrastructure is sparse. A single Basic Health Unit (BHU) at Jalal Khan provides limited primary care to surrounding villages and is reported to have poor building conditions and service quality. One small private clinic/medical shop also operates near Jalal Khan. For serious or emergency cases, patients commonly travel to Bhag Tehsil, the Kachhi District Headquarters, Dhadar, Dera Murad Jamali or even Jacobabad (Sindh), all of which are at considerable distance and require private transport.

Table 4-27: Health Facilities Serving the Project Area

Location	Hospital	Rural Health Centre	BHU	Dispensary	Midwife/LHWs
Jalal Khan/nearby	–	–	1	–	Limited
Bhag (reference)	1 (city)	–	–	–	–

Source: Socio-economic survey by PIU team

Common health issues reported include: water-borne diseases (diarrhea, dysentery, typhoid); vector-borne diseases (malaria, dengue) after floods; respiratory infections linked to dust; malnutrition in children and pregnant women; heat-related illnesses; and incidents of snake bite and scorpion stings. Maternal and child health services are limited and often require travel outside the area.

4.5.14 Vulnerable Population Groups

Several groups within the project area face heightened vulnerability to shocks, constrained access to services and barriers to participation.

Table 4-28: Vulnerable Population Groups and Characteristics

Vulnerable Group	Est. % of Population	Key Vulnerabilities	Specific Needs
Women	50%	Limited land/credit, mobility, literacy, decision-making	Gender-sensitive engagement, GBV prevention, livelihoods
Children	40%	Out-of-school, child labor, malnutrition	Education access, nutrition, protection
Elderly	5%	Heat stress, chronic disease, limited mobility	Health care, social protection, heat action support
Persons with Disabilities	3%	Physical barriers, exclusion, limited services	Accessible facilities, inclusion, assistive devices
Landless/poorest	35%	Food insecurity, debt, inadequate housing, no assets	Priority employment, livelihood support, safety nets

Female-headed HHs	2%	Economic vulnerability, social stigma, weak support	Targeted assistance, protection mechanisms

Source: Socio-economic survey by PIU team

4.5.15 Water Supply and Sanitation

Only one formal water-supply scheme was identified at Bhag, outside the immediate project area. 60 % households in the four villages rely on self-arranged drinking water, transporting surface or groundwater by donkey carts and small vehicles. Water is fetched by women and children in the nearby areas or if at less distance and at far distances its fetched by the male members and brought by donkeys. Both surface water and groundwater may be used during construction depending on contractor arrangements, but, as noted in Section 4.2.9, untreated water often fails bacteriological and salinity criteria for safe drinking. Sanitation infrastructure is basic; many households rely on simple pit latrines or open defecation, posing public-health risks.

4.5.16 Communication and Electricity

Telephone landline facility does not exist in the sub-project area; however, mobile network service providers such as Ufone and in Zong (in very limited areas) are available with very low connectivity (no mobile data working). The houses in the project area are connected to the electricity poles for their domestic use. In addition, load shedding of the electricity was observed at the peak during the survey, where only 1-2 out of 24 hours in a day of electricity is available for the whole area and villages. Natural piped gas supply is not available in channel villages (lines were fully damaged in flash flood of 2022). The residents of these villages use bushes and firewood from the nearby forests to meet their domestic needs.

4.5.17 Means of Transport

The sub-project area is located around 15 km away from Tehsil Bhaag on north west side of Bahag city. On its East is Sibi area and on west is Kalat Khuzdar area and at its South is Jhal Magsi area but its access is to Tehsil Bhag. The community travels to Bhaag city on, tractor cars and pickups. Individuals in the community often use their own source of transport (mainly motorbikes). Link roads of these four villages are Katcha tracks and also are in very poor condition and in need of construction/rehabilitation.

4.5.18 Social Conflicts

There are no reported tribal conflicts in the sub-project area. However, there are customary channels of conflict resolution in the district. These channels are private/tribal (Jirga) and which are settled for a long time by communities and elders by themselves. The private/tribal channel has, in many cases, proved to be more effective in conflict resolution than the government one. During the baseline survey, indicated by the local communities that there is no tribal conflict observed at all in past and present years on the scheme and free from it.

4.5.19 Money Lending

In the sub-project area, capital is not borrowed from banks for agricultural purposes. If, money is borrowed from middlemen (artis) for agricultural inputs (seeds, fertilizers, etc.)

and health treatment, (i.e., illness). In times of need, community members take loans from relatives and friends, and in some case from the Seth (Hindu middlemen who provides loans on interest).

Table 4-29: Purpose of the Visit to nearest City

Purpose of Visit	Jalal Khan Village (in %)
Family relations	75
Marketing/Business/Agriculture	100
Educational	25
Health	40

Source: Socio-economic survey by PIU team

4.5.20 Source of Livelihood and Income

Gram (locally called Channa) and Sorghum (Jwar) is the dominant crop in the area, accounting for the majority share of cultivated land and production. Mustard (Sarson), Mixed Whole Green Gram and Moth Bean Lentil (Moong, Moth) also contribute significantly, making up a large portion of overall crop output. Other cereals such as wheat, cotton and rice occupy only a small share in comparison. Among fruits, no native fruit was reported however, Jujube (Ber) represent only a minor fraction of the fruit output in the area. Furthermore, the baseline survey indicates that agriculture is the primary source of income in Jalal Khan and the monthly income ranges from PKR 40,000 to PKR. 70,000. All the households also have a secondary source of income, that is livestock, transportation and earn between PKR 10,000 to PKR 15,000 on a monthly basis from a secondary source of income.

4.5.21 Agriculture Tools and Farm Machinery

The agriculture of the sub-project is dependent on rain and floods where the water is available for late Khareef (autumnal) to Rabi (spring) season crops. The farmers do not possess any of the equipment used in agriculture such as plough of oxen, plough of the tractor, tractor, and trolley for tractor and thresher due to poverty and cropping pattern. While the farmers possess a spray machine used for Gram crop. The other farm machinery such as tractor for plough and thrasher machines are available on rent cost 2500-3000 per working hours.

Table 4-30: Type of Agriculture Tools and Machinery

Type of Equipment's	Jalal Khan Village (in %)
Plough for oxen	00
Plough for tractor	03
Tractor	10
Spray Machine	100
Trolley for tractor	10
Thresher	00

Source: Socio-economic survey by PIU team

4.5.22 Commonly Used Agriculture Inputs

As the soil of the project area is fertile and healthy and there is no need to utilize the fertilizers, although pesticides is necessary for gram crops. The average agricultural expenses per acre, including seed, pesticide, ploughing and harvesting costs, are mentioned below.

Table 4-31: Estimated Expenses per Year per Acre

Items	Expenses (PKR)/Acre
Ploughing	3,000/working hour
gram seeds /bag (40kg)	10,000
Pesticides/Lit (bottle)	2000/each
Wheat /bag (40kg)	5000
Sorghum /bag (25kg)	8000
Mustard /bag (25kg)	4000
Mixed Whole Green Gram and Moth Bean Lentil (Moong, Moth)	7000

Source: Socio-economic survey by PIU team

4.5.23 Seasonal Earnings & Production from Crops

During the baseline survey, the following average seasonal earnings and production of crops per acre were reported in the sub-project area.

Table 4-32: Average Seasonal Earnings/acre

Seasons	Average Seasonal Production/Acre (in Mund)	Average Seasonal Earning/Acre (Per Mund in PKR)
Gram	15-20	8000
Wheat	15-20	3500
Sorghum	12-15	14000
Mustard	15	7000
Mixed Whole Green Gram and Moth Bean Lentil (Moong, Moth)	12-15	22000

Source: Socio-economic survey by PIU team

4.5.24 Land Ownership

The land ownership in the command area is distributed among shareholders (lineage based). The record of this ownership is available in the revenue department. During the survey, it was revealed that the sale of land is not common practice in Project area. However, if the land is sold, the land transfer of ownership is done formally and is recorded with the Revenue Department.

4.5.25 Anticipated Losses due to the Project

The potential losses in terms of physical and economic displacement are not expected due to

the proposed intervention:

Table 4-33: Anticipate Losses due to Project

Anticipates	Results
Loss of Residence	No
Loss of cultivated/uncultivated/barren land	60.68 acres of land acquired through the VLD process
Loss of trees	There are 141 forest trees present in the proposed subproject area.
Loss of Livelihood	No
Loss of Other infrastructure	No

Source: Socio-economic survey by PIU team

It is important to note that agriculture is the main source of income for all households and they will be benefitting from the improvement and construction activities after which the required water will be controlled and equally shared to these without losses. As such, therefore, the community will have the net benefit and no long-term loss with irreversible impacts.

4.5.26 Local Government and Administration

Elected members of the provincial and national assemblies are now playing an active role in overseeing development activities within their respective constituencies. Previously, under the Balochistan Local Government Act 2013, local government representatives—including chairmen, vice-chairmen, and councilors were responsible for planning and implementing development initiatives at the village, union council, and district levels.

At the village and union council levels, development activities were managed by the chairman and councilors, while at the district level, the district council, led by its chairman, held overall responsibility for development planning and execution. However, this local government system is no longer operational in the area.

In the current context, many former local government representatives continue to engage as political workers and are informally collaborating with members of the provincial and national assemblies. Through this coordination, they support and contribute to ongoing development efforts in their respective areas.

Despite the existence of elected representatives in many areas, a large portion of the system is considered "non-working" in a practical sense:

- **Functional Issues:** As of April 2025, over 27% of Union Councils in Balochistan were reported as non-operational.
- **Reasons:** This is primarily due to a lack of budgetary allocations and the failure to transfer administrative and financial powers from the provincial government to the local level

The district-level bureaucracy is also involved in this process as well, which consists of the Commissioner, Deputy Commissioner, Additional Deputy Commissioner, Assistant Commissioner, officers' in-charge of line departments, and revenue officials.

4.5.27 Law and Order Situation

Law and order situation is uncertain in overall Balochistan province particularly in these areas. There are also sometimes disturbances on the main highway to Kachi however the sub project area is comparatively safer. The local communities are very supportive and in close coordination with the district administration, as for as other political parties to maintain the law-and-order situation together with law enforcement agencies. Comparatively no such security threat has been identified at the moment.

4.5.28 Community Cultural Properties

The following community cultural properties are found in the scheme area. These cultural properties do not fall in RoW or the alignment area of Jalal Khan scheme, its channels, and distributary minors. The details are illustrated in the following table.

Table 4-34: Community Cultural Properties

Project site	Grave Yard	Mosque	In RoW
Jalal Khan	03	04	No

Source: Socio-economic survey by PIU team

5

STAKEHOLDER CONSULTATIONS

5. STAKEHOLDER CONSULTATIONS

5.1 Stakeholder

5.1.1 General

Stakeholder engagement is a cornerstone of the Environmental and Social Management Plan (ESMP) and is aligned with World Bank Environmental and Social Standard 10 (ESS10), which emphasizes meaningful and inclusive consultation and transparent information disclosure. Public participation and community consultations are essential to ensure that the voices of those potentially affected by the project are heard and integrated into decision-making.

For the rehabilitation of the Subproject, consultations were conducted with diverse stakeholders including local communities, government agencies, businesses, and other affected parties. The objective was to capture their concerns, insights, and local knowledge, and to incorporate these into the planning, design, and implementation phases of the Project.

This process recognizes that open and transparent engagement between the Borrower and stakeholders is not only a requirement under ESS10, but also an element of good international practice. Effective stakeholder engagement enhances environmental and social sustainability, builds trust, strengthens project acceptance, and contributes significantly to successful project outcomes

- Obtain feedback from primary stakeholders and community members (including women).
- Obtain feedback from secondary stakeholders.
- Mobilize farmers for the formation of Farmers' Organizations.
- Mobilize women for the formation of Women Development Groups.

5.2 Methodology of Consultation

Two major rounds of community consultations were carried out at the sub-project level with 77 male and 62 female both sides in New Rehanzai, Rehanzai Kona, Jamra and Jalal Khan, of Kachhi Plain areas of the project. These consultations were aimed not only at introducing the project but also at informing communities about the **anticipated positive and adverse environmental and social impacts**, and obtaining their feedback to inform project design and mitigation measures.

1. **First Round – Project Introduction, Community Mobilization, and Initial Impact Awareness (January 2026)**

The first round of meetings was conducted on 19–20 January 2026 to introduce the BWSPIP project and orient local community members on its objectives, expected benefits, and implementation approach. These sessions also highlighted the importance of establishing

Farmers' Organizations (FOs) to strengthen local participation and ensure long-term sustainability of irrigation management.

During this phase, communities were informed about the anticipated positive impacts, including improved irrigation efficiency, enhanced agricultural productivity, reduced flood risks, and better water management. At the same time, initial discussions were held regarding potential adverse impacts, such as temporary disruption during construction, limited land requirements (including voluntary land donation), and environmental concerns.

Community members shared their initial views, concerns, and expectations, which were documented and considered for further design and planning.

2. Second Round – Design Presentation, Impact Discussion, and Community Feedback (**January 2026)**

The second phase of consultations were held from 22-24 of January 2026 with the same comminties by conducted activities at field level and focused on presenting and discussing the technical design of the proposed Flood Dispersal/Weir and Allied Structures at Jalal Khan (Nari River Basin). The project team shared design drawings, construction methodologies, and proposed implementation arrangements.

In addition to design discussions, the sessions explicitly covered anticipated environmental and social impacts, including:

- Temporary impacts during construction (e.g., dust, noise, access limitations)
- Land-related aspects, including voluntary land donation
- Potential impacts on local livelihoods and movement
- Environmental considerations such as vegetation removal and water flow changes

Participants were encouraged to provide feedback on both benefits and risks, including site selection, design suitability, and mitigation measures. Their inputs contributed to refining project interventions and developing appropriate mitigation measures within the ESMP.

At the beginning of the consultations, both male and female participants were somewhat hesitant, as the concept and technical aspects of the project were unfamiliar to them. However, as the sessions progressed and detailed explanations were provided, participants became increasingly engaged, cooperative, and enthusiastic.

Both men and women expressed their willingness to actively participate in project implementation. Male farmers contributed through walk-through site surveys, sharing local knowledge of flood behavior, irrigation channels, and agricultural conditions. Meanwhile, women highlighted key social priorities, including improved access to clean water, energy, education, and livelihood opportunities. These inputs have been incorporated into the ESMP, particularly in social and gender-related mitigation measures.

The details of participants and attendance records are provided in Annexure M.

Table 5-1: Location and date of consultative meeting with Male Community

S. No.	Location	No of Participants	Date
1	New Rehanzai	24	19/01/2026
2	Rehanzai Kona Jala Khan	30	21/01/2026

5.3 Formation of Farmers Organization (FO)

To ensure community-based management and sustainability of the irrigation infrastructure, two Farmers' Organizations (FOs) were formed during January 2026—one each at New Rehanzai and Rehanzai Kona, Jalal Khan along the Sehan main channel.

FO members were selected through a participatory community process, with representatives elected by local farmers. The FOs serve as key institutional partners for BWSPIP and are responsible for:

- Coordinating between the community, Contractor, and Project Implementation Unit (PIU) during implementation;
- Facilitating stakeholder communication and grievance redress at village level;
- Overseeing equitable water distribution and routine maintenance after construction; and
- Supporting awareness-raising and environmental and social safeguard compliance activities.

Table 5-2: Location and date of formation of FO

S. No.	Location	No of Participants	Date
1	New Rehanzai	11	24/01/2026
2	Rehanzai Kona Jala Khan	12	22/01/2026

5.4 Summary of Discussions

To facilitate the members and communities in a proper way, the information and comments were gathered through a structured format using 12 prescribed questions. The following is a result of the main comments and views expressed by the stakeholders, and the measures are taken to satisfy them during the consultation:

Table 5-3: Summary of Key Discussions

S. No.	Topic of Discussion	Measures to be Implemented
1.	**Water supply to tail-end farmers and distributary minors**	• Construct the main dispersal channel and all distributary minors to full design capacity before the first spate flow season • Design the weir structure to maximize flow diversion and ensure the head regulator and under-sluice operate at full discharge during monsoon peak flows • Assign Farmers Organization (FO) representatives as water-sharing monitors for each distributary; mandate monthly rotation reviews during the first two irrigation seasons • Conduct at least two capacity building sessions per year for FO members on equitable water distribution, measurement, and record-keeping • The PIU and PDSC will carry out quarterly field visits during the first

		operating season to verify tail-end delivery performance against design discharge • Document all water-sharing complaints through the GRM and resolve within 15 days
2.	**Contractor camp siting and associated activities**	• Finalize camp location jointly: the Contractor, PIU engineering team, PIU social team, and community FO representatives must agree on the site before any camp construction begins • Locate camp at minimum 500 m from the nearest residential settlement (Rehanzai New, Rehanzai Kohna, Jamrah, or Jalal Khan) and away from water bodies and drainage lines • Conduct an environmental and social screening of the proposed camp site before approval; submit site plan to PIU and PDSC for written clearance • Inform and obtain acknowledgement from the affected community through the FO before mobilizing camp construction • Camp boundary must be fenced with signage; no unauthorized community access to camp; no worker access to villages after working hours • All camp waste, sanitation, and drainage systems to be operational from Day 1 of camp occupation; inspect weekly
3.	**Dust and noise from construction activities**	• Water the access road and all active earthwork areas at least twice daily; increase to three times daily during dry or windy weather (May–June) • Limit all heavy vehicle speeds to 20 km/h within 500 m of any village • Schedule all noisy works (excavation, concrete breaking, compaction) between 08:00 and 17:00 on weekdays only; no works on Fridays or public holidays • Monitor dust (PM10) monthly at the site boundary using a portable meter; record results against NEQS 24-hr limit of 150 µg/m³ and report to PIU • Post a notice board at the site entrance showing the Contractor's CLO name and contact number for community complaints • Cover all trucks transporting loose material (sand, gravel, soil) with tarpaulins before leaving the loading point
4.	**Labor influx and interaction with local communities**	• Prioritize hiring of local unskilled labor: minimum 75% of total unskilled workers to be recruited from Rehanzai New, Rehanzai Kohna, Jamrah, and Jalal Khan villages • Restrict non-local workers to camp and worksites; no unauthorized interaction with community members; enforce through CoC • All workers sign the Code of Conduct (CoC) before site entry; zero exceptions; retain signed copies in Contractor HR records • Brief all workers on community norms, GBV/SEA/SH prohibition, and community engagement protocols during the mandatory pre-entry induction • The Contractor's Community Liaison Officer (CLO) must hold a monthly community update meeting with FO representatives to address any labor influx concerns • Log and resolve all labor-related community complaints through the GRM within 15 days; report to PIU monthly
5.	**Privacy and safety of women and children during construction**	• Maintain all existing community footpaths and access routes throughout construction; if any route is temporarily blocked, provide a clearly marked and safe alternative before closure • Erect site boundary fencing and safety barriers at all active work fronts to prevent community entry into construction zones • Conduct GBV/SEA/SH awareness sessions for all workers before

		mobilization, then monthly during construction • Conduct quarterly community GBV/SEA/SH awareness sessions in all four villages, facilitated separately for women by a female team member • Any SEA/SH incident must be reported to the PIU Gender Specialist within 24 hours and handled under the SEA/SH Action Plan with full confidentiality • Zero-tolerance policy: any worker confirmed to have violated community privacy or committed SEA/SH will be immediately dismissed and barred from site re-entry
6.	**Formation of Farmers Organizations (FOs) and their role**	• Complete FO formation for all four directly affected villages before the first community consultation round ends • FOs must include representation from tail-end farmers, women (minimum 30% female members), and landless households • Conduct a minimum of three FO capacity building sessions covering: water management, GRM procedures, ESMP roles, and community grievance rights • FOs are the primary community interface for construction monitoring; assign one FO representative per active work front to observe and report ESMP compliance issues • PIU Social Specialist must attend all FO monthly meetings and document minutes; share with World Bank as part of quarterly E&S progress reports • FO formation records and membership lists must be submitted to PIU and included in Appendix K of the ESMP
7.	**Employment opportunities for local community**	• The Contractor must hire a minimum 75% of unskilled workers directly from the four project villages; preference to landless households and those with donated land • Publish the local hiring policy in Urdu and Balochi on notice boards at camp entrance and village FO offices before mobilization\ • Coordinate all local hiring through the FO to ensure transparency and prevent favoritism; maintain a hiring register open to community inspection • Provide on-the-job skills training to local workers in construction trades (masonry, shuttering, earthworks, equipment operation) to build lasting employable skills • Pay all workers at or above the Balochistan minimum wage; wages to be paid weekly, directly into workers' accounts or in cash in front of a witness • Provide all workers with payslips showing hours worked, rate, deductions, and net pay; keep records available for PIU and PDSC inspection
8.	**Scope of work and quality assurance**	• Share the final engineering design drawings with FO representatives before construction starts; explain scope, timelines, and key milestones in plain language • Post a construction schedule (Gantt chart format) at the FO office and site entrance; update monthly with actual progress • PDSC engineers will carry out weekly quality assurance inspections; findings documented in site diaries available to PIU on request • FO representatives may participate in monthly site walkthroughs with the PDSC; findings and concerns logged and addressed within 15 days • Any design change that affects scope, community access, or environmental impact must be communicated to the FO and PIU before implementation; significant changes require World Bank notification • The PIU will conduct at least two formal construction quality audits during the contract period and share results with the World Bank

9.	**Grievance Redress Mechanism (GRM) orientation**	• Provide every FO member and community household head with a printed GRM information card in Urdu and Balochi showing: how to submit a complaint, who receives it, and timelines for response • Install GRM complaint boxes at the FO office, each village notice board, and the contractor camp entrance; check and log all submissions weekly • Designate a named PIU GRM Focal Person and a Contractor CLO as the two access points; both names and contact numbers posted publicly • Acknowledge all complaints within 72 hours; resolve within 15 working days; if resolution takes longer, communicate interim status to complainant • Maintain a GRM register with complaint number, date, type, status, and resolution; share summary in every quarterly E&S report to the World Bank • GBV/SEA/SH complaints are handled separately through a confidential channel by the PIU Gender Specialist; no names disclosed without consent
10.	**Participation of absent community members in consultations**	• FO members who attended consultations must brief absent farmers within 10 days through separate village sittings; document attendance and key points raised • PIU Social Specialist and Contractor CLO will jointly follow up with absent landowners, especially all 14 VLD land donors, to confirm their awareness and consent • All future consultation sessions must be announced at least 7 days in advance through village notice boards and FO communication channels • Minutes of all consultations must be shared with FOs in Urdu within 5 days of each session; one copy filed with PIU and one with the FO • Maintain a consultation attendance register with names, gender, and contact information; submit to PIU as part of quarterly E&S reporting • Communities can raise concerns at any time through the GRM; no formal consultation session is required to log a complaint
11.	**Water rights and existing community water-sharing arrangements**	• Document all existing community water-sharing arrangements (customary water rights, turn-based distribution) before construction starts; include in Appendix of C-ESMP • Construction activities must not disrupt existing water supply to any household or farm during the construction period; plan diversions and closures in advance with FO agreement • Notify affected farmers at least 72 hours before any planned interruption to water flow; provide timeline for restoration • Existing customary water rights will not be altered by the project; any issue related to post-construction water sharing must be escalated to PIU and PDSC within 5 working days • Include a water rights clause in the Contractor's contract: any damage to existing water structures or arrangements caused by construction must be repaired by the Contractor within 48 hours at no cost to the community • The PDSC will verify water rights documentation and include a compliance check in every quarterly supervision report
12.	**Voluntary Land Donation (VLD) process and documentation**	• All 14 VLD land parcels (60.68 acres total) must have complete documentation: signed stamp paper agreements, cadastral record extracts, and VLD screening checklists per BWSPIP RPF format • Submit complete VLD documentation package for all 14 parcels to the World Bank for review and written no-objection before contract award • Each landowner must confirm in writing: the area donated is less than 10% of their total holding; donation is voluntary with no pressure; they

		understand their right to raise concerns through the GRM • No construction activity on any VLD parcel until World Bank no-objection is received and confirmed in writing to the Contracto • PIU Social Specialist will conduct a post-construction land condition check within 6 months of works completion to confirm donated parcels are restored and unencumbered • VLD monitoring status and any landowner concerns must be reported in every quarterly E&S progress report to the World Bank

Source: Community consultation sessions, January 2026 (New Rehanzai and Rehanzai Kohna/Jalal Khan). Participant details in Appendix K, May 2026. All measures to be included in the Contractor's ESMP (C-ESMP) and monitored in Table 7-5.

5.5 Summary of Findings of Consultation with Farmers

In addition to the information given about the sub-project works, communities were also provided brief information about the BWSPIP Project. The farmers expressed their willingness and cooperation vis-à-vis the project.

5.6 Consultation with Women Community

Consultation sessions with local women were also conducted in two different locations of all four villages of the Jalal Khan. The Female member of the study team conducted these sessions. Most women consulted were not educated and housewives. The women of the area were keenly interested in the consultations and provided significant information regarding the possible role and needs of women in the project. The input was provided regarding the planned activities of the construction of irrigation and future OFWM and Rangeland activities.

The list of women participants is provided in Annexure: M

Table 5-4Consultative meeting with Women Community

S. No	Location	No of Participants	Date
1	New Rehanzai	12	19/01/2026
2	Rehanzai Kona Jala Khan	12	20/01/2026

5.7 Women Development Groups (WDGs)

Based on the above-mentioned theme given in para-1 of section 7.4; to support the implementation of women-related activities, it was planned that at least 45% women in each village are mobilized and organized into Women Development Groups (WDGs). This process realized by involving the potential local active women in the village and then these potentialwomen have facilitated the social teams of the project to identify and train all their other members in the respective areas, to participate in the decision-making process so that they can involve in all planned interventions properly which would be carried out by the BWSPIP Balochistan in its different designed components. The men local farmers would also provide support to the social staff of the project in the implementation and monitoring of the

women related activities as well. Once women are organized and trained, then the women members would then be engaged on need basis to identify water and farming needs and shall prioritize income generation activities which may include all relevant topics discussed, including those that may not be directly relevant to the planned interventions.

In the first round of consultations, women were oriented briefly about the project development objectives of BWSPIP Project and its benefits; and the need for and purpose of WDGs.

In the second round of meetings, WDGs were formed covering all villages. These groups include a chairperson, vice-chairperson, general secretary, treasurer executive, and general body members. All the positions were nominated and selected by the respective community. These elected members will work closely with the BWSPIP project for the betterment and fulfillment of women's needs.

Table 5-5: Location and date of Meeting for the formation of WDGs

S. No	Location	No of Participants	Date
1	New Rehanzai	20	19/01/2026
2	Rehanzai Kona Jala Khan	18	20/01/2026

5.8 Findings of Women Consultations and Priority Needs

During consultations, women participants shared their perspectives and longstanding challenges. They emphasized that, due to the district's remote location and limited government presence, basic services and infrastructure remain largely unavailable—particularly for poor women and girls.

They noted that prolonged electricity load-shedding has severely affected daily life. In the absence of a reliable power supply, women are often compelled to fetch water from distant areas for drinking and domestic use. The lack of electricity also causes hardship after sunset, as women and children struggle to carry out routine household tasks at night.

Some households that can afford it use small solar systems to meet basic electricity needs; however, due to widespread poverty, the majority of families are deprived of this facility and continue to live under conditions reminiscent of decades past, without access to lighting, refrigeration, or basic modern conveniences.

Additionally, households depend on fuelwood collected from surrounding hills and bushes for cooking and heating. This physically demanding and time-consuming task, mostly carried out by women and children, adds to their daily burden. Participants expressed the urgent need for safer and more sustainable household energy alternatives and recommended the provision of a natural gas supply in the area.

The women expressed strong interest in livelihood generation programs and requested targeted support in the following priority areas:

- Installation of solar panels to ensure a reliable source of electricity;
- Provision of natural gas connections for household energy needs;
- Construction of a girls' high school to improve access to secondary education;
- Establishment of a drinking water supply system;
- Support for poultry farming and livestock rearing, including regular vaccination services; and
- Construction of separate washing facilities for clothes and kitchen use to promote hygiene and privacy.

5.9 Institutional Stakeholders Consultations with District Administration

Separate consultation meetings were held with Tehsildar, Assistant Commissioner, Deputy Commissioner, and other government representatives. In the meeting, PIU, the Irrigation Department along with Social team of the study informed the representatives of the district administration about the BWSPIP project and the proposed Jalal Khan Dispersal structure and allied activities in detailed.

During the meeting, the scope of work, construction schedule, VLD process, and other associated project activities were discussed in detail. It was communicated accordingly to the district administration that the BWSPIP sub-project will require lands permanently. In this regard, 14 different sites are mutually identified by the project team and completed the VLD process. The team also discussed in detail the previous volatile law and order situation of the sub-project area. It was revealed that presently there is no law-and-order issue in the project area but, there are possible law and order risks that can occur during the implementation process. Therefore, to tackle the possible risks in the future, support is and will be required from the district administration and law enforcement agencies. All the officials of the district administration offered their complete support for the execution of the project. The list of attendees is provided in Annexure : L

Table 5-6: Meetings carried out with District Administrations

S. No.	Location	Date
1	Deputy Commissioner	20/01/2026
2	Tehsildar	21/01/2026
3	SDO Irrigation	22/01/2026

5.10 FUTURE CONSULTATIONS

The draft ESMP report will be re-disclosed to stakeholders and the public to confirm that their concerns and remedial measures have been incorporated, with the final version accessible on the World Bank and PIU/FCU websites and available upon request. Continuous

consultation will be maintained to ensure community support and keep them fully informed, particularly before and during construction periods, through regular meetings during project implementation. In these upcoming consultations, communities will be informed more robustly that a project-specific Grievance Redress Mechanism (GRM) has already been established, providing a transparent and time-bound process to receive, evaluate, and resolve environmental and social concerns, thereby reinforcing accountability and strengthening stakeholder engagement in the subproject.

5.10.1 Stakeholder and Worker Consultation Schedule

The proposed Stakeholder and Worker Consultation Schedule below outlines the future consultation and engagement activities to be conducted during the pre-construction, construction, and post-construction phases of the project. The schedule defines the stakeholders to be consulted, methods of engagement, key discussion topics, implementation timing, and responsible parties to ensure effective communication, stakeholder participation, worker awareness, grievance management, and coordination throughout the project lifecycle. The table below showing the stepwise consultations during;

Table 5-7: Proposed 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

Project Stage	Stakeholders / Workers	Method	Key Topics	Frequency / Timing	Responsibility
Construction	Contractor and subcontractor workers	Toolbox talks / safety meetings	OHS, PPE, activity-specific risks, first aid, emergency response, waste management, traffic safety	Monthly and before high-risk activities	Contractor / HSE Officer
Construction	Workers and camp staff, where relevant	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

Figure 5-1: Consultation Meetings with Community Elders and Members on Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin



6

IMPACT ASSESSMENT & MITIGATION MEASURES

6. IMPACT ASSESSMENT AND MITIGATION MEASURES

6.1 GENERAL

The sub-project has been designed in line with World Bank Environmental and Social Standard 1 (ESS1), which requires systematic assessment, management and monitoring of environmental and social risks and impacts throughout the project cycle. ESS1 principles are embedded in this ESMP to ensure that risks are addressed responsibly and outcomes remain consistent with international safeguard standards.

Most anticipated adverse impacts are minor to moderate, localized, temporary and reversible, while the main positive effects arise from rehabilitating and strengthening existing flood dispersal/weir and allied structure rather than constructing entirely new infrastructure. Sustainability and climate resilience considerations have guided planning and design so that key risks are identified early for both construction and operation phases and addressed through appropriate mitigation and enhancement measures.

As with most construction and rehabilitation works, the majority of impacts will occur during construction phase and will depend heavily on contractor performance and the effectiveness of supervision and monitoring. The ESMP therefore provides a structured framework that identifies potential environmental and social impacts, predicts their magnitude, assesses significance, specifies mitigation measures and evaluates residual impacts once mitigation is applied. This section summarizes anticipated E&S impacts of the proposed activities, the criteria and methods used to assess them, and the approach to mitigation and monitoring.

Positive Impacts of the Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin:

The Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin will generate substantial positive environmental and social benefits for Rehanzai New, Rehanzai Kohna, Jamra, Jalal Khan and the wider command area. Approximately 26,000 acres of agricultural land will be protected from recurrent flood damage and enabled for more reliable irrigation, leading to improved crop yields, enhanced food security and stronger livelihoods for farming households.

By reducing the frequency and severity of overbank flooding, the dispersal structure will protect residential areas, public infrastructure, local roads and essential services from inundation and damage. Stabilized riverbanks and controlled flood flows will reduce erosion, lower the risk of dispersal structure breaches and provide long-term protection for adjacent farmlands and community assets, improving the overall reliability of flood management.

In terms of community safety, the dispersal structure will significantly lower the risk of loss of life, displacement and damage to homes during extreme flood events, thereby improving

perceived and actual security for local residents. The more stable river corridor is also expected, over time, to improve the landscape quality along the protected bank and create opportunities for informal recreation and community use, contributing modestly to local amenity and quality of life. Overall, the sub-project supports climate-resilient, sustainable development by strengthening flood resilience, safeguarding agricultural productivity and enhancing public safety in a high-risk floodplain.

Anticipated Negative Impacts of the Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin:

Despite its overall positive contribution, the sub-project may cause certain adverse environmental and social impacts, primarily during construction. Earthworks, excavation, material transport and operation of heavy machinery will generate dust, noise and vibration, which may temporarily affect nearby settlements, agricultural fields and sensitive receptors if not adequately controlled. Short-term disruption to local access routes, irrigation channels and informal pathways may interfere with daily movement, farming activities and emergency access unless alternative routes and clear signage are provided.

Construction activities also create occupational and community health and safety risks, including potential accidents involving machinery and vehicles, unsafe work practices and unmanaged open excavations. Children, livestock and other community members may be exposed to hazards if work sites are not properly fenced, signposted and supervised. In limited locations, minor land use changes or temporary occupation of land along the riverbank may be required for construction, which could disturb cultivation or informal uses even though large-scale land acquisition and physical displacement are not anticipated.

All identified negative impacts are expected to be localized, temporary and reversible, and can be effectively managed through full implementation of the ESMP: including good construction management, erosion and sediment control, dust and noise suppression, safe traffic and access management, proper waste handling, robust OHS and community safety measures, and regular monitoring and supervision. Key Construction-phase Risks and Mitigation Measures of Jalal Khan FD/W are summarized in Table 6-17.

6.2 ASSESSMENT METHODOLOGY

Impacts were assessed using an adapted Leopold Matrix. Each impact was evaluated against three significance criteria: (i) institutional: compliance with laws and standards; (ii) technical: scientific guidelines and expert judgment; and (iii) public: community concerns from consultation sessions. Impacts rated 'medium' or higher triggered mandatory specific mitigation measures in Table 7-5.

Table 6-1: Stepwise Methodology for Impact Assessment

Step	Description
1. Criteria for determining significance	Potential consequences are evaluated against recognized significance criteria: (i) institutional (laws, standards, policies), (ii) technical (guidelines, scientific knowledge, expert judgement) and (iii) public (social and cultural values, views of affected communities).
2. Determining magnitude of potential impacts	Anticipated impacts are described and, where possible, quantified in terms of scale, duration, frequency and reversibility.
3. Identification of mitigation measures	For impacts considered significant, appropriate mitigation options are identified, following the mitigation hierarchy: avoid, minimize, rectify/restore and compensate/offset.
4. Evaluation of residual impacts	After mitigation is applied, remaining (residual) impacts are evaluated to confirm whether they fall within acceptable limits.
5. Identification of monitoring requirements	Minimum monitoring requirements (parameters, frequency, locations, responsibilities) are defined to verify that impacts remain within predicted limits and to trigger corrective action if required.

Table 6-2: Key Construction-phase Risks and Mitigation Measures – Jalal Khan FD/W

Risk / Potential Impact	Significance*	Key Mitigation and Management Measures
Dust emissions and reduced air quality from excavation, haulage and stockpiles	Medium	Water sprinkling on exposed surfaces and haul roads, covering of stockpiles and trucks, speed limits, equipment maintenance.
Elevated noise and vibration affecting nearby settlements and workers	Medium	Limit noisy activities to daytime, maintain equipment, use silencers where possible, provide PPE (ear protection), monitoring.
Disruption of village access routes, footpaths and irrigation channels	Medium	Prepare and implement Traffic and Access Management Plan; provide temporary crossings/alternate routes; clear signage.
Occupational health and safety risks (machinery, excavations, heat stress, PPE gaps)	Medium–High	OHS Plan, mandatory PPE, toolbox talks, first-aid facilities and paramedic on site, emergency procedures.

Community health and safety risks (unfenced work sites, vehicle movements, children)	Medium	Fence and signpost work areas, flag-men at crossings, speed control, community awareness, restricted public access.
Soil erosion, riverbank instability and accidental dispersal structure damage during works	Medium	Phase works with flow regime; use proper compaction and slope protection; temporary works design; rapid repair protocols.
Surface and groundwater contamination from spills, waste oil and poor waste handling	Low–Medium	Spill prevention and response plan, lined refueling/maintenance areas, waste segregation, licensed disposal of hazardous waste.
Temporary loss or disturbance of small land parcels / informal uses near the riverbank	Low–Medium	Minimize footprint; avoid crops where possible; provide prior notice and, where needed, compensation or livelihood support.
Disturbance to local flora/fauna and riparian habitats	Low–Medium	Avoid vegetation clearing outside RoW; Clearing of natural vegetation and cutting of trees will be minimized as far as possible during the earth's works. The five (05) trees of each tree cut shall be planted protect riparian belts; no hunting; restore disturbed sites and borrow areas.

*Significance reflects unmitigated risk level during construction; residual risk is expected to be low if ESMP and C-ESMP are fully implemented.

Key **operation-phase** benefit and risks of Jalal Khan FD/W are summarized in Table 6-18.

Table 6-3: Key Operation-phase Benefits and Risks – Jalal Khan FD/W

Aspect / Potential Issue	Type	Significance*	Key Outcomes / Mitigation Measures

Protection of 26,000 acres of command area from recurrent flooding	Benefit	Major	Reduced crop and asset losses; more reliable spate irrigation; increased food security and farm incomes.
Reduced damage to settlements, roads and public infrastructure	Benefit	Major	Lower repair costs; improved connectivity and service continuity during monsoon events.
Enhanced community safety and reduced displacement during extreme floods	Benefit	Major	Fewer flood-related casualties and evacuations; higher community resilience and sense of security.
Riverbank stabilization and reduced erosion along protected reach	Benefit	Moderate	More stable channel alignment; protection of dispersal structure toe and adjacent farmlands.
Potential changes in local floodplain dynamics downstream or opposite bank	Risk	Low–Medium	Maintain design according to hydrological studies; periodic inspection; adaptive engineering measures if issues arise.
Inadequate O&M of dispersal structure leading to progressive weakening or breaches	Risk	Medium	Establish routine inspection and maintenance plan; clear roles/budget within line departments; community reporting.
Encroachment on dispersal structure or RoW (cultivation, structures, grazing)	Risk	Medium	Enforce RoW by-laws; signage; community awareness; coordination with local administration.
Continued pressure on vegetation and fuelwood along river corridor	Risk	Low–Medium	Promote alternative energy/efficient stoves; tree planting schemes; enforcement against indiscriminate cutting.

**Significance reflects anticipated importance during operation assuming standard O&M; residual risks can be kept low with proper maintenance and enforcement.*

6.3 SCREENING OF POTENTIAL E&S IMPACTS

A preliminary environmental and social screening was conducted using environmental and social screening) checklist tailored for construction of flood dispersal/weir and allied structure. The E&S screening helped identify likely interactions between sub-project activities and environmental and social components and guided the subsequent, more detailed assessment.

6.3.1 Impact Matrices

Impact assessment used adapted Leopold Matrix (LM) techniques to systematically examine interactions between sub-project activities and environmental and social components. The matrices provide a structured, largely qualitative tool to compare alternatives, highlight key risks and prioritize mitigation, rather than producing a single aggregated numerical score.

The matrix framework lists project activities along one axis and environmental/social components along the other, allowing reviewers to visualize where direct, indirect and induced impacts may occur and how mitigation measures modify those interactions. Impacts are categorized as:

- **Direct impacts:** arising from immediate interaction between an activity and an environmental or social receptor (e.g. dust from earthworks affecting nearby households).

- **Indirect (secondary) impacts:** occurring through more complex pathways or at some distance from the initial action (e.g. increased traffic on local roads due to construction logistics).
- **Induced/cumulative impacts:** resulting from growth-inducing effects or changes in land use or population patterns that may emerge over time if the project proceeds.

Each impact is further characterized according to its nature (positive/negative), magnitude (minor/moderate/major), spatial extent (local/widespread), duration (temporary/permanent; short/long-term) and reversibility (reversible/irreversible).

For evaluation, the following descriptive scale is used:

- **Negligible / No impact:** Obscure or imperceptible influence on physical, ecological or socio-economic conditions.
- **Low adverse impact:** Slight influence, easily mitigated with standard good practice.
- **Medium adverse impact:** Noticeable influence that requires specific mitigation but can be reduced to acceptable levels.
- **High adverse impact:** Significant influence that can only be partially mitigated and requires careful management and, where necessary, design changes.
- **Positive impact:** Improvement in environmental quality or socio-economic conditions.

Impact characterization matrices are provided for both construction and operation phases in Tables 6-3 and 6-4, with corresponding evaluation matrices summarizing magnitude, duration and likelihood. These matrices inform the detailed Environmental and Social Mitigation and Monitoring Plan in Chapter 7.

6.4 CUMULATIVE IMPACTS

Consistent with ESS1 of the World Bank Environmental and Social Framework, the assessment examined whether the sub-project could contribute to significant cumulative environmental or social impacts when considered together with other existing, ongoing or reasonably foreseeable initiatives within its Area of Influence. The review included consultations with district and provincial departments, examination of development plans and records, and field reconnaissance to identify any parallel or planned infrastructure, industrial, agricultural or settlement-expansion projects near the Jalal Khan FD/W.

No major concurrent projects were identified in the immediate vicinity that would create additive or synergistic impacts in combination with the proposed works. The sub-project includes, the construction of a 42.66-meter RCC weir structure, clearing of bushes and stripping, construction of one head regulator and one under-sluice. The works also involve installation of five gates, earthwork for approximately 2,000 meters of irrigation channels and guide bunds, steelworks, and uprooting and removal of 141 stumps within a 1 km area.. The

potential adverse impacts related to the sub-project activities are spatially confined, short-term and readily mitigable through the ESMP.

Implementation of the mitigation and monitoring measures outlined in Chapters 6 and 7 will further reduce any residual impacts during construction and operation. Given the nature, scale and location of the sub-project, and the absence of other significant concurrent activities, no adverse cumulative impacts are anticipated; instead, the flood dispersal structure/weir, irrigation channels and guid bunds are expected to contribute positively to cumulative outcomes by enhancing regional flood resilience, protecting agricultural land and settlements, and improving overall disaster preparedness in the Kachhi Plain.

Table 6-4: Characterization of E&S Impacts – Construction Phase

Environmental / Social Component	Direction	Duration	Location	Frequency	Extent	Significance	Reversibility
	☆	•	Long	Short	Direct	Indirect	Continuous
Topography	☆	•		☆		•	
Surface water quality	☆	•		☆	•		
Groundwater quality	☆	•		☆	•		
Ambient air quality		•		•	☆		
Noise level		•		•	☆		
Soil quality	☆	•		•	☆		
Solid waste		•		•	☆		
Construction camps		•		•	☆		
Flora – shrubs		•		•	•		
Flora – trees		•		•	•		
Fauna – mammals		•		•		•	
Fauna – birds		•		•	☆		
Worker health and safety	☆	•		•	☆		
Community health and safety	☆	•		•	☆		
Economic activity (employment, services)	☆		☆		☆	•	•

Legend: Negative impact = ● Positive impact = ☆

Table 6-5: Characterization of Potential E&S Impacts – Operation Phase

Environmental / Social Component	Direction	Duration	Location	Frequency	Extent	Significance	Reversibility
	☆	•	Long	Short	Direct	Indirect	Continuous
Topography / river morphology	☆	•	☆		•	•	•

Environmental / Social Component	Direction	Duration	Location	Frequency	Extent	Significance	Reversibility
Surface water quality		•		☆	•	•	•
Groundwater quality		•		☆	•	•	•
Ambient air quality		•		☆	•	•	
Noise level		•		☆	•	•	
Soil quality / erosion	☆	•	☆		•	•	•
Solid waste (O&M, visitors)		•		☆	•	•	
Flora – riparian vegetation	☆	•	☆		•	•	•
Fauna – mammals/birds (disturbance)	☆	•	☆		•	•	•
Worker health and safety (O&M crews)	☆	•		☆	•	•	
Community health and safety (residual flood risk, access)	☆	•	☆		•	•	
Economic activity (agriculture, trade, services)	☆		☆		•	•	•

Legend: Negative impact = ● Positive impact = ☆

This assumes:

- Long-term, largely **positive** effects on safety and economic activity.
- Residual **negative** risks are low–moderate and manageable through O&M and enforcement.

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

Sr. No.	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	Social disturbance	Disruption of public utilities	Employment	Traffic issues
1	Construction of RCC weir and allied structures, construction of camps, workshops, offices	LA	LA	LA	LA	MB	LA	LA	LA	LA	LA	LA	0	0	LA
2	Levelling / tree cutting	LA	LA	0	LA	LA	LA	LA	LA	LA	LA	0	0	0	LA
3	Excavation operations	LA	LA	LA	LA	0	LA	LA	LA	LA	LA	LA	0	0	LA
4	Construction material storage and handling	0	LA	0	0	LA	0	0	0	0	0	0	0	0	LA
5	Open storage of construction materials, fuel etc.	0	LA	0	0	LA	0	LA	0	0	0	0	0	0	LA
6	Solid waste generation and handling	LA	LA	LA	LA	LA	0	LA	0	LA	LA	LA	0	0	0
7	Use of chemicals	0	0	0	LA	LA	LA	LA	0	LA	LA	LA	0	0	0
8	Earthwork operations	LA	LA	LA	LA	0	0	LA	LA	LA	LA	LA	0	0	LA
9	Operation of concrete	LA	LA	LA	LA	0	LA	0	LA	0	0	LA	0	0	0

Sr. No.	Project Activities	Physical Environment								Ecological Environment		Socio-economic Environment			
	batching plant														
10	Use of generators	LA	LA	0	LA	0	LA	LA	MA	0	LA	LA	0	0	0
11	Heavy equipment / machinery	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA	0	0	0
12	Plantation along RoW	LB	MB	MB	0	0	MB	MB	MB	MB	MB	0	0	0	0

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

Table 6-7: E&S Impacts Evaluation during Operation Phase

Sr. No.	Project Activities / Aspects	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**
1	Routine operation of FD/W (normal flow conditions)	MB	MB	MB	LB	LA	MB	0	0	LB	LB	0	0	LB	0
2	Operation during flood events (design flows)	MB	LA	LB	LA	LA	MB	0	0	LA	LA	LA	LA	0	LA
3	Inadequate maintenance / bund deterioration (risk)	LA	LA	LA	LA	LA	MA	0	0	LA	LA	LA	LA	0	0
4	Encroachment on RoW (cultivation, informal structures)	LA	LA	LA	LA	0	LA	0	0	LA	LA	LA	LA	0	0

5	Continued fuelwood collection along river Corridor	0	LA	LA	0	0	0	0	0	LA	LA	0	0	0	0
6	Enhanced agricultural production in protected command Area	MB	MB	MB	LB	0	MB	0	0	LB	LB	LB	0	MB	0

Legend: 0 = No impact LA = Low Adverse MA = Medium Adverse HA = High Adverse
LB = Low Beneficial MB = Medium Beneficial HB = High Beneficial NA = Not Relevant

6.5 ANTICIPATED ENVIRONMENTAL & SOCIAL IMPACTS AND MITIGATION MEASURES

The sub-project will generate environmental and social impacts on physical, ecological, and socio-economic components during design, construction, and operation phases. Construction-phase impacts are more pronounced but are generally short-term, localized, reversible, and low to medium in magnitude when systematically managed through this ESMP and the Contractor's ESMP (C-ESMP). This section summarizes key impacts and mitigation measures by theme; detailed responsibilities, indicators, and monitoring requirements are provided in Table 7-2.

6.5.1 Topography and Soil

The sub-project lies on a broad, low-lying alluvial plain receiving sediments from the **Nari, Talli, and Bolan** river systems (Section 4.2.1), with subsurface materials dominated by Quaternary alluvium (silt, clay, and sand) over deeper sedimentary strata (Section 4.2.3). Soils are mainly silty loams to silty clays, classified as **Haplic Yermosols**, with high calcium carbonate content, low organic matter, and a tendency to crust when dry and become sticky and poorly drained when saturated. The sub-project lies in **Seismic Zone 3** (BCP 2021, Section 4.2.5), which requires that embankment compaction and earthwork design adequately address ground stability and potential settlement under seismic loading.

Design-phase impacts: Impacts on topography are limited to minor changes associated with optimized embankment profiles and related structures. Visual changes will be modest and can be improved through plantation along the RoW and careful shaping of embankment slopes.

Construction-phase impacts: Earthworks, excavation, borrow-area use, and flood dispersal and allied structures construction can cause localized soil erosion, compaction, contamination from fuel and oil spills, and creation of poorly restored pits that may hold standing water and become vector-breeding sites. Flash flood dynamics (Section 4.2.6) can rapidly erode exposed embankment faces and newly excavated borrow areas during monsoon events if left unprotected. These impacts are assessed as low to medium adverse, short-term, and reversible with proper construction practices and site restoration.

Table 6-8: Impact Characterization: Topography and Soil

Phase	Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance
Design	Direct	Long-term but minor	Reversible with slope shaping and RoW plantation	Likely with project	Minor	Low adverse (pre-mitigation)
Construction	Direct	Short-term (construction period), localized	Reversible with good construction practice and site restoration	Likely without controls	Moderate	Low–medium adverse (pre-mitigation)

Mitigation Measures:

- Restrict excavation and earthworks to approved footprints within demarcated RoW and borrow-area boundaries; refer to Borrow Area ECOPs in **Annexure [C]**
- Prioritize non-productive, barren, or public wasteland for borrow areas; avoid productive agricultural land wherever feasible
- Store and handle fuels, lubricants, and chemicals on paved/impervious surfaces with drip-trays and bunds; collect and dispose of contaminated soil as per waste management procedures in Section 6.6.8
- Collect oil and lubricant drips during equipment maintenance in suitable containers; prohibit on-ground draining
- Reuse spoil where suitable; dispose of surplus material only at PDSC/PIU-approved sites; restore all temporary sites to pre-project or agreed conditions
- Protect freshly exposed embankment faces and borrow areas from monsoon-season flash flood erosion through temporary drainage channels, chutes, and silt barriers (Section 4.2.6)
- Apply compaction specifications consistent with **Seismic Zone 3** requirements (BCP 2021, Section 4.2.5) to ensure embankment stability under potential seismic loading

Residual Impact: Low and reversible following full implementation of mitigation measures and borrow-area restoration.

6.6 ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES

6.6.1 Air Quality

During the construction phase, a temporary decline in ambient air quality is expected in and around the work sites due to operation of construction machinery and vehicles, excavation, earthworks, material handling, and use of diesel generators. These activities will generate exhaust emissions containing carbon monoxide (CO), sulphur dioxide (SO_2), oxides of nitrogen (NO_x), and particulate matter (PM_{10} and $PM_{2.5}$), as well as dust from vehicle movement on unpaved access and haul routes. Baseline ambient air quality in the sub-project area, measured and presented in Section 4.2.7, is currently within National Environmental Quality Standards (NEQS), and this baseline will serve as the reference for construction-phase monitoring.

The impact has been characterized as follows:

Table 6-9: Impact of Characterization-Air Quality

Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance

Direct	Short-term	Reversible	Certain	Moderate	Medium adverse

To minimize deterioration of air quality, the following mitigation measures will be implemented:

- Contractor camps, batching plants and major machinery yards will be located at least **500 m** away from residential communities and sensitive receptors, as far as practically feasible.
- All construction machinery, generators, equipment and vehicles will be kept in good working condition, regularly maintained and tuned to minimize exhaust emissions; emissions will comply with Relevant NEQS. Limit the idling time of construction vehicles to 3 to 5 minutes to minimize local air pollution.
- Continuous or frequent **water sprinkling** will be carried out on exposed surfaces, haul roads, and work areas to reduce dust generation, with particular focus on sections near villages and settlements. The water would be obtained from tube wells installed by the Contractors or maybe greywater from the camp areas and reuse of wastewater from batching plant
- Project vehicles will avoid passing through communities and cultivated fields as far as possible; where unavoidable, vehicle speeds on unpaved roads near communities will be limited to **15 km/h** to reduce dust and accident risks.
- While working within or near communities (e.g. for access improvements or structures), the Contractor will coordinate closely with community representatives to minimize adverse effects on crops, houses and cultural values, and will seek prior agreement for any temporary use of land for haulage or access.
- Any farmland temporarily used for haulage or material handling will be used only with prior permission of landowners and with clear arrangements for compensation and restoration.
- Diesel generators will be fitted with acoustic enclosures and exhaust stacks of appropriate height to ensure proper dispersion of emissions and reduction of noise.
- Conduct ambient air quality monitoring as per NEQS periodically as per ESMP Plan
- The minimum generator stack height and clearance from existing structures shall be as defined in the following figure.

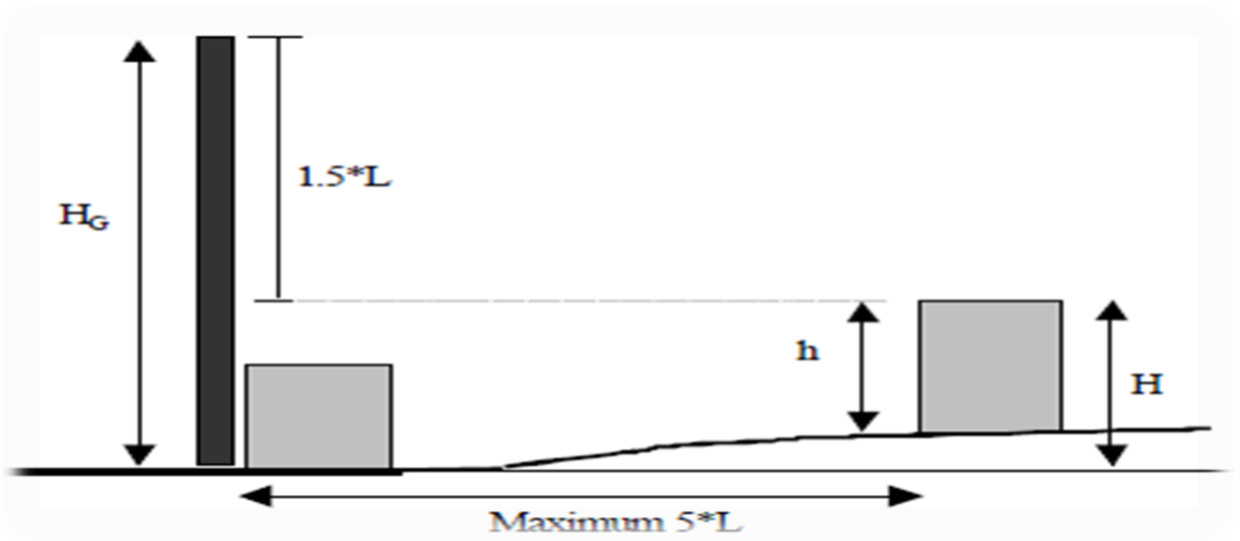


Figure 6-1: Minimum Generator Stack Height and Clearance

Source: World Bank Group IFC General Environmental, Health and Safety Guidelines

- **$H_{G=}$ H+1.5L**
- **Where:**
  $H_{G=}$=Stack height measured from ground level
  H= Height of existing nearby structures above ground level at the stack
  L= lesser dimension of h or w
  h= Height of existing nearby structures
  w= Width of existing nearby structures

Residual Impact: With the above measures fully implemented and with periodic air quality monitoring as specified in Table 7-2 and Annexure-H, concentrations of PM, SO_2, NO_x and CO are expected to remain within NEQS at sensitive receptors. The impact on ambient air quality is therefore expected to be reduced to **medium, short-term and reversible**, during works and return to **negligible** after demobilization.

6.6.2 Dust

Construction activities will increase dust levels within the sub-project area, particularly due to excavation, embankment construction and strengthening, clearance of vegetation, operation of the batching plant (if used), and movement of vehicles on earthen haul routes and katcha tracks. Dust may also be generated by wind erosion of exposed surfaces and stockpiles of aggregates, sand, and fill materials. If not properly controlled, these emissions can affect workers' health, reduce visibility, and create nuisance for nearby communities.

The following table identifies work activities, the likelihood and consequence of potential dust emissions (low, medium, high), and the expected duration of such emissions.

Table 6-10: Potential for Dust Emissions by Works Activity

Stage	Description	Potential Dust Emitting Activities	Likelihood	Duration	Consequence
Access to site	Transport of materials and personnel to and around the site	Heavy and light vehicles using unsurfaced access routes causing the suspension of dust	Likely	Short term	Moderate
Construction/rehabilitation of structures and construction of camps	Construction of Flood dispersal and allied structures regulators, protection bund Construction of temporary and permanent facilities (staff and office accommodation, workshops, storage, security walls, etc.)	Concrete batching/mixture machines Transport of materials Storage of materials Preparation of materials (cutting etc.)	Certain	Short term	Moderate
Decommissioning	Demolition, site clearance	Earthmoving Excavation Transport of materials Re-suspension of dust on un-surfaced roads	Certain	Short term	Minor

The impact has been characterized as follows:

Table 6-11: Impact of Characterization-Dust Generation

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

Mitigation measures to control dust will include:

- Use of **water bowsers** to sprinkle water on embankment works, earthworks and all unpaved haul roads at a frequency sufficient to prevent visible dust plumes, with priority given to sections near villages and community access routes.
- Repair and improvement of key katcha access routes using hard-core or suitable fill material to make them safely passable for heavy vehicles, thereby reducing dust generation; vehicle speeds on such routes will be limited to **15 km/h**.
- Preparation and implementation of a **Traffic Management Plan** (Section 7.7.5) identifying designated access and haul routes; the Contractor will be prohibited from using routes other than those approved in this Plan.
- Minimization of double-handling of materials during earthworks and embankment construction, and avoidance of unnecessary drop heights when loading/unloading materials.
- Prohibition of vegetation clearance beyond the defined right-of-way and work footprint, thereby limiting exposed soil surfaces.
- Regular water sprinkling at material stockpiles and during loading/unloading where visible dust is generated.
- Transportation of cement, sand, aggregates and other fine materials in **covered trucks** or bags to prevent spillage and wind-blown dust.

Residual Impact: With these measures implemented consistently and monitored through the environmental and OHS inspection regime and GRM, dust emissions are expected to be reduced to levels causing only temporary, localized nuisance. The residual impact on air quality from dust with effective implementation, dust impacts are expected to decline to **medium adverse** during works and return to **negligible** after demobilization.

6.6.3 Occupational Health and Safety

The construction phase of the sub-project will involve a range of high-risk activities, including establishment and operation of contractor camps, excavation and earthworks, installation of a batching plant (if used), intensive movement of heavy machinery (excavators, dumpers, loaders, cranes), manual handling of materials, and transport of construction materials and waste. These activities create occupational health and safety (OHS) risks for workers, community and site visitors, particularly if not managed through a systematic OHS framework consistent with ESS2, national labor and OHS legislation, and the World Bank Group Environmental, Health and Safety (EHS) Guidelines.

Key risks include: accidents involving heavy machinery and traffic; injuries from manual handling and excavation; exposure to hazardous substances; fire hazards from flammable materials; inadequate sanitation and hygiene in camps; and lack of PPE or safety protocols.

Key potential impacts include:

- Accidents due to movement and operation of heavy machinery and vehicles.
- Exposure to hazardous substances arising from unsafe storage and handling of fuels, oils, admixtures and chemicals.
- Musculoskeletal injuries from improper manual handling and excavation activities.
- Fire and explosion risks associated with flammable and combustible materials.
- Ill-health due to sub-standard sanitation, overcrowding and poor hygiene in labor camps.
- Adverse health effects from prolonged exposure to dust and high noise levels.
- Increased risk where PPE use and safety procedures are inadequate or not enforced.

Mitigation measures – Occupational Health & Safety

- Contractor to appoint a qualified OHS/Safety Officer with day-to-day responsibility for worker safety at each worksite, in line with WBG EHS Guidelines.

- Identification of potential hazards to workers, particularly those that may be life-threatening
- The contractor shall prepare and implement a project-specific OHS Plan, including job safety analysis for high-risk tasks, emergency preparedness and response, and reporting of incidents.
- Provide and enforce use of appropriate PPE (helmets, safety boots, reflective vests, gloves, eye and hearing protection, dust masks/respirators, etc.).
- Design and maintain safe access/egress routes; segregate pedestrian paths from vehicle routes; implement traffic control and signage.
- Ensure safe storage, labelling and handling of fuels and chemicals; provide spill kits and fire-fighting equipment at strategic points.
- Provide adequate lighting, ventilation, safe drinking water, sanitation, first-aid kits and a staffed first-aid post/dispensary at camp.
- Establish worker accommodation in line with the IFC/EBRD Workers' Accommodation Guidance Note and the standards outlined in Section 3.3.3.

- Conduct regular safety training, toolbox talks and induction sessions;.
  Documentation and reporting of training, occupational accidents and corrective actions, diseases, and incidents.

With these measures, occupational health and safety risks can be reduced from medium to **low residual risk**, consistent with good international industry practice.

Community Health and Safety

During construction, several project activities and situations have the potential to affect the health, safety and well-being of nearby communities, particularly those living along access routes and close to work fronts and camps. To ensure these risks are systematically identified and managed, key community-facing activities and their worst-case consequences have been summarized in the below **Table 6-12.**

Table 6-12: Activities and Potential Community Health & Safety Impacts (Worst Case)

Activity / Situation	Potential Impact (Worst Case)
Construction traffic on village roads	Injury/death of pedestrians, children or livestock from vehicle collisions
Heavy vehicles passing near houses/schools	Increased accident risk, dust and noise affecting vulnerable groups
Open excavations, stockpiles and work fronts	Falls, entrapment or injury to community members entering unsecured areas
Temporary blockage of paths or watercourses	Delayed access to fields, markets, schools and health facilities; conflict risk
Storage and handling of fuels/chemicals	Community exposure to spills, fires or explosions near settlements
Poor waste management around camps	Vector-borne disease, nuisance and contamination of local surroundings
Labor influx and interaction with residents	Harassment, GBV/SEA risks, social tension or disputes with local communities
Night-time works or generator operation	Sleep disturbance, stress and reduced well-being in nearby households

Mitigation measures – Community Health and Safety

The contractor will prepare and implement a project-specific Community Health and Safety (CHS) Plan and Traffic Management Plan, consistent with World Bank Group General EHS Guidelines and the project SEP/LMP, to manage the risks identified in Table 6-10. At a minimum, these plans will include:

- Identification and assessment of community-level risks associated with construction traffic, open excavations, work fronts near settlements, labor influx and hazardous-material storage, with particular attention to children, women, elderly persons and persons with disabilities.
- Preventive traffic-safety measures such as speed limits, warning signs, flag-persons at critical crossings, vehicle movement schedules that avoid school hours and peak community movement times, and designated parking/turning points away from houses and schools.
- Site-safety measures for the public, including fencing, barricades, lighting and clear signage around excavations, stockpiles, camps and active work areas, and controlled access to prevent entry by unauthorized persons, especially children.

- Procedures for maintaining safe access to homes, fields, mosques, schools and health facilities, including provision of temporary diversions, safe footpaths and timely repairs to any damaged paths, culverts or water channels.
- Protocols for respectful interaction between workers and community members, implementation of a Code of Conduct, GBV/SEA/SH prevention measures, and confidential, survivor-centered referral pathways where needed.

- The contractor must ensure respectful Work Environment and prepare and implement Sexual Exploitation, and Abuse (SEA) prevention and response action Plan
- Community awareness and information-sharing, led by the Community Liaison Officer, on construction schedules, risks, safe behavior around worksites and use of the project Grievance Redress Mechanism.

Systematic recording and follow-up of community complaints, incidents and near-misses through the GRM and site registers will enable timely corrective action and help ensure that residual community health and safety risks remain low and acceptable throughout the project.

Workers' Accommodation

To ensure that worker housing and camp facilities for the sub-project comply with good international industry practice, the contractor will align planning, design and operation of all accommodations with the Workers' Accommodation: Processes and Standards Guidance Note issued by the World Bank Group (IFC/EBRD). Table 6-10 summarizes the key guideline areas and corresponding best-practice implementation approaches that are directly Relevant to the Jalal Khan FD/W camps and support the broader OHS and community health and safety measures described in this ESMP.

The contractor will also follow the WBG guidance summarized in **Table 6-13: Workers' Accommodation Guidance Note**, which sets best-practice measures for air emissions, noise, waste and wastewater management, resource efficiency, OHS, community health and safety, hazardous materials, biodiversity, emergency preparedness, labor conditions and decommissioning.

Table 6-13: Workers' Accommodation Guidance Note (World Bank Group – IFC/EBRD)

Sr No.	WBG/IFC Guideline	Description / Focus Area	Best Practice / Implementation Approach
1	Air Emissions and Ambient Air Quality	Controls emissions from construction machinery, vehicles and dust sources.	Regular maintenance of machinery; use of low-emission fuels; dust suppression (water sprinkling); covering stockpiles; ambient air quality monitoring.
2	Noise Management	Ensures acceptable noise levels for workers and nearby communities.	Use of mufflers and silencers on equipment; restrict noisy activities to daytime; noise

Sr No.	WBG/IFC Guideline	Description / Focus Area	Best Practice / Implementation Approach
			barriers near sensitive receptors; provide PPE (earplugs).
3	Waste Management	Promotes proper collection, storage, transport and disposal of solid and hazardous waste.	Segregate waste; promote reuse/recycling; dispose of residual waste at approved sites; maintain waste records and manifests.
4	Water Quality and Effluent Management	Prevents contamination of surface water and groundwater.	Control runoff and sedimentation; provide proper wastewater collection and treatment; no direct discharge to natural water bodies; use septic tanks where required.
5	Resource Efficiency and Pollution Prevention	Encourages efficient use of energy, water and materials.	Use energy-efficient equipment; minimize water wastage; reuse excavated materials where possible; apply sustainable procurement principles.
6	Occupational Health and Safety (OHS)	Protects workers from occupational hazards.	Conduct job safety analysis; provide PPE; install safety signage; carry out toolbox talks; maintain emergency preparedness and response plans; ensure first-aid availability.
7	Community Health and Safety	Minimizes risks to nearby communities due to project activities.	Implement traffic management plan; fence and signpost sites; conduct awareness sessions; operate an effective GRM; maintain continuous liaison with community leaders.
8	Hazardous Materials Management	Ensures safe handling, storage and disposal of hazardous substances (fuels, oils, chemicals).	Provide spill kits and secondary containment; clearly label containers; keep MSDS on site; train workers in safe handling and emergency procedures.
9	Biodiversity Conservation and Sustainable Resource Management	Protects flora, fauna and natural habitats from project impacts.	Avoid works during critical breeding seasons where relevant; implement replantation/afforestation; avoid unnecessary clearing; maintain buffer zones.
10	Emergency Preparedness and Response	Guides response to accidental spills, fires or natural hazards.	Prepare and regularly update an emergency response plan; conduct drills; coordinate with

Sr No.	WBG/IFC Guideline	Description / Focus Area	Best Practice / Implementation Approach
			local authorities; establish clear communication procedures.
11	Labor and Working Conditions	Promotes fair treatment, non-discrimination and safe working environment.	Comply with labor laws; prohibit child and forced labor; ensure equal opportunity; establish a worker grievance mechanism.
12	Construction and Decommissioning Activities	Manages impacts during project execution and closure.	Implement a site management plan; restore disturbed areas; remove debris and temporary facilities; safely demobilize machinery and camps.

Mitigation measures – Workers' Accommodation

These guideline areas and good-practice measures will be integrated into the contractor's Health and Safety Plan, Camp Management Plan and C-ESMP, and will be reflected in contract conditions and supervision checklists to ensure effective implementation. Consistent application of the Workers' Accommodation guidance, together with the specific OHS and CHS measures outlined in Sections 6.6.3 and 6.6.8, will help maintain safe, healthy and dignified living conditions for workers while minimizing off-site environmental and social risks to surrounding communities. Labor camps and work areas will be designed and operated in line with the IFC/EBRD Workers' Accommodation: Processes and Standards guidance, including:

- Adequate lighting, power supply, fire-fighting equipment and clearly marked emergency exits.
- Segregation of pedestrian routes from vehicle circulation; safe, non-slippery walking surfaces and housekeeping to minimize slips, trips and falls.
- Ventilated, weather-protected dormitories with at least 4 m² of floor area per person, minimum building height of 2.1 m, washable hard floors and secure doors/windows.
- Sufficient sanitary and washing facilities with privacy partitions, lined washing areas and reliable safe drinking water meeting national standards.
- Dedicated, sheltered kitchen and dining areas separate from sleeping quarters, with provisions for hygiene, pest control and food safety.
- Routine camp cleaning, laundry facilities, mosquito nets where needed, and measures to exclude disease-carrying animals and insects.
- Readily accessible first-aid kits and, where feasible, an on-site paramedic or nurse.

With effective implementation and supervision, residual occupational health and safety risks are expected to be **low**, consistent with good international industry practice.

6.6.4 Noise and Vibration

Noise and vibration will arise from construction traffic, earthmoving equipment, batching plants and diesel generators, particularly when works occur near settlements or during night hours. Baseline noise levels are currently below NEQS; unmitigated construction noise could therefore be noticeable and cause temporary disturbance.

Typical sound pressure levels for key equipment expected on site are shown in Table 6-14, indicating that, without controls, short-term exceedances of NEQS limits could occur close to equipment and at nearby receptors.

Table 6-14: Noise Levels of Equipment/Machinery

Equipment / Machinery	Typical Noise Level (dB(A))
Generator	< 85
Bulldozer	96
Roller	90
Grader	< 85
Truck	96
Concrete mixer	< 85
Concrete pump	< 85

Table 6-15: Impact characterization – Noise and vibration

Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance
Direct	Short-term	Reversible	Certain during active works	Minor	Low adverse (pre-mitigation)

Mitigation measures

Mitigation measures to control noise and vibration will include:

- Limiting normal construction working hours to **06:00–18:00**, six days per week, particularly for high-noise activities near settlements; any night-time works (e.g. continuous concrete pouring) will require prior written approval from the PDSC and prior notification to affected communities.
- Restricting movement of construction vehicles and personnel to designated work areas and approved haul routes, and avoiding unnecessary idling of engines.
- Ensuring that all plant, vehicles, and generators are fitted with appropriate silencers, acoustic enclosures and other manufacturer-provided noise-control devices, and that these are maintained in good working order through regular servicing.
- Prohibiting the use of pressure horns on project vehicles when passing through or near communities, and enforcing reduced speeds on access roads.
- Requiring the Community Liaison Officer to **notify affected communities in advance** of particularly noisy activities and any work to be undertaken outside normal daytime hours, and to record and address any noise-related concerns through the GRM.

- Training equipment operators and drivers on potential noise and vibration impacts and on techniques to minimize noise (e.g. smooth operation, avoiding sudden acceleration or braking, shutting down idle equipment).
- Implementing relevant Environmental Code of Practices (ECoPs) in Annexure-C related to noise control and equipment operation.

Residual Impact: With these measures implemented and with periodic noise monitoring at representative locations as defined in Table 7-2, noise and vibration impacts are expected to remain within NEQS limits at community receptors and to be temporary and localized. The residual impact significance is therefore assessed as **low adverse (pre-mitigation) during construction**, reducing to neutral following completion of works and demobilization of equipment.

6.6.5 Loss of Vegetation and Trees

The trees and scattered vegetation cover will be removed during embankment protection work and the construction of the dispersal/weir and allied structures, at sub-project. During the survey, it was found that 141 trees are anticipated to be felled, and all these trees belong to the irrigation department. A strip of approximately 1Km will need to be cleared from the area for the embankment protection work. The cleared vegetation material may be reused to backfill the abandoned portion of the land or to close temporary diversions. The details of the tree species which are anticipated to be felled are shown in the table below:

Table 6-16: Felling of Trees

Serial No	Location	Name of tree species	Number of total trees to be cut
1	Jalal FD/Weir Structure	Acacia Nilotica (Kikar-Babur)	11
		Tamarix Aphylla/Frash Tamarix (Ghaz)	09
		Prosopis cineraria (Kandi/Jhang)	04
		Salvadora oleoides (Khabar)	02
2	Two Cell Culvert	Tamarix Aphylla/Frash Tamarix (Ghaz)	03
		Acacia Nilotica (Kikar-Babur)	03
		Prosopis cineraria (Kandi/Jhang)	01
	Embankment Protection works + Irrigation Channel	Tamarix Aphylla/Frash Tamarix (Ghaz)	48

		Acacia Nilotica (Kikar-Babur)	37
		Ziziphus mauritiana (Ber):	5
		Prosopis cineraria (Kandi/Jhang)	18

Table 6-17: Impact Characterization-Loss of Vegetation and Trees

Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance
Direct	Short Term	Reversible	Likely	Moderate	Medium Adverse

Mitigations

The following mitigations measures shall be adhered to by the contractor before and after tree cutting:

- The five (05) trees of each tree cut shall be planted. A Total of (141*5=705) new trees shall be planted.
- The new tree plantation shall be preferred at locations from where the trees had been cut. In addition, the contractor along with PDSC will jointly identify tree plantation areas.
- The community shall be consulted about the expected removal of trees to avoid anticipated frustration among the local community.
- Clearing of natural vegetation and cutting of trees will be minimized as far as possible during the earth's works.
- The construction crew will be provided with The LPG cylinder shall be provided for cooking and heating purpose. The use of fuel wood will not be allowed.
- No fires will be allowed in the open.
- The contractor shall mark each tree that needs to be removed with a cross on all four sides using a highly visible paint. The marking shall be located approximately 4.5 feet from the base of the tree.
- The contractor shall prepare an inventory of all trees to be cut. The inventory shall include the following details for each tree:
- Reference number
- Location
- Species
- Girth
- Approximate height
- Photograph of tree
- The contractor will submit the inventory of expected trees to be cut to the PDSC and PIU. No tree cutting will be permitted until written approval is received from the

Engineer.

- An inventory of trees cut by the contractor during the execution of works will be maintained throughout the construction period. The contractor will minimize the number of trees to be cut, making careful and selective pruning where possible to reduce the need for removal.
- The PDSC/PIU will only approve tree cutting where a complete tree inventory has been submitted to the PDSC/PIU all trees included in the request. A joint visit between the Engineer and the Contractor (or their representatives) will be carried out to verify the inventory before approval.
- Once the contractor receives approval from the PDSC and PIU, he can proceed to cut the sanctioned trees and will store them in a designated and secure storage area.
- The Contractor will mark each cut section of a tree with a unique reference number that corresponds to a reference number given in the tree inventory.
- The Contractor will maintain the tree inventory to include the number of cut sections of each tree and storage details of each section removed from the site. The tree inventory will be kept up-to-date and available to the Engineer at all times.
- The contract for the works will include the plantation of five times the number of mature trees that are cut during construction. A mature tree is defined as a tree with a girth greater than 0.15 m (six inches). The contractor will be responsible for the aftercare of these trees for one year
- All trees to be replanted will be native species as they have the best chances for survival.
- All cut down trees will be handed to the irrigation department.

Residual Impact

By planting five (05) trees of each tree cut and through the implementation of a community-based plan for tree plantation. The significance of the residual impacts on the floral resources of the area is expected to be positive in the long term.

6.6.6 Waste Management

During the construction phase of the Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin, various types of waste will be generated from construction activities and worker camps. These include solid waste (excavated soil, packing materials, metal scrap, and wood), hazardous waste (used oils, filters, lubricants, and oil-contaminated rags), and domestic waste from the labor camps (food waste and plastic). Improper disposal of these wastes could lead to soil contamination, degradation of water quality in the Nari River basin, and the creation of unsanitary conditions that attract pests. The impact has been characterized as follows:

Table 6-18: Impact Characterization – Waste Management

Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance

Direct	Short-term (construction period)	Reversible with controls	Certain without controls	High	Medium–High adverse (pre-mitigation)

Mitigation Measures

To ensure proper handling and disposal of waste, the following mitigation measures will be implemented:

- The Contractor will adopt the "3R" principle (Reduce, Reuse, and Recycle). Dedicated bins for organic, recyclable (plastic, metal, paper), and non-recyclable waste will be provided at the campsite and active work zones.
- Waste storage areas will be clearly marked. All hazardous waste, such as used oil and chemicals, will be stored in leak-proof containers on an impervious surface (bunded area) to prevent soil and groundwater contamination.
- The burning of any waste material, including plastic and wood, is strictly prohibited to prevent the release of toxic fumes and ensure compliance with NEQS for air quality.
- Non-hazardous solid waste will be disposed of at a site designated by the local district administration. No waste shall be dumped into the riverbed or natural drainage channels.
- Septic tanks and soakage pits of adequate capacity will be constructed at labor camps to manage domestic sewage. These will be located at least 50 meters away from any water source or groundwater well.
- Used lead-acid batteries and oil shall be sold only to EPA-authorized waste recyclers.
- Upon completion of works, the Contractor will remove all remaining waste, debris, and temporary structures, ensuring the area is restored to its original or better condition.

Residual Impact

With the strict implementation of the Waste Management Plan and regular site inspections, the potential for soil and water contamination will be significantly minimized. The residual impact is expected to be **low, short-term, and reversible**, confined primarily to the construction period, with no long-term environmental degradation expected following demobilization.

6.6.7 Surface and Ground Water Pollution

Improper management of solid and liquid waste, leakage of fuels and oils, and inadequate waste management at camps and construction sites can contaminate surface water and groundwater. Given existing water-quality constraints, additional pollution would disproportionately affect households relying on shallow groundwater or nearby surface sources. Wastes shall include demolition material (concrete, masonry, steel gates, and rubber seals) and debris from construction sites (excess aggregate, sand, etc.) Improper disposal of domestic waste, food waste, sewage waste can result in contaminated leachate

or runoff reaching the ground or surface water resources. Proper management of solid waste is also important because of the risk that improper solid waste handling and disposal poses to human health and environmental degradation. Delay in the delivery of solid wastes to landfills (dump sites) results in nuisance and unpleasant odors, which attract flies and other disease vectors. Open solid waste dumps can also provide suitable breeding places for vermin and flies and other disease vectors and can also contain pathogenic micro-organisms. The risk of leaks or spills is especially high in the main camp and or from the vehicles. Contaminated groundwater holds potential health hazards if the contaminant reaches groundwater aquifers which are exploited for drinking purposes. Risks of groundwater contamination may also result from wastewater disposal in any of the camps.

Table 6-19: Impact characterization – Surface and groundwater pollution

Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance
Direct	Short-term	Reversible with clean-up and natural attenuation	Likely if unmanaged	Moderate	Medium adverse (pre-mitigation)

Mitigation measures

- Site contractor camps at least 500 m from settlements and away from surface-water bodies where feasible; The contractor shall submit camp layout and waste-management plan to PDSC/PIU for approval.
- Provide properly designed septic tanks and soak pits for domestic wastewater; The Septic tank and soak pit shall be covered properly to avoid any obnoxious smell in the surrounding areas. The soak pit will be built in absorbent soil and located 300m away from a water well, Soak pit will be constructed such that surface runoff cannot enter the pits monitor effluent quality periodically.
- Restrict vehicle washing to designated areas with appropriate drainage and oil traps.
- Store fuels and hazardous materials in bunded, roofed areas with impervious floors and controlled access; label tanks/containers clearly and keep MSDS on site.
- Provide secondary containment for fuel storage and generators; equip refueling points with concrete pads and drip trays.
- Wastewater from laundry, kitchen washings and showers will be disposed of in separate soak pits.
- In case the soak pits are filled, greywater will be sprinkled over access tracks. A sprinkling of greywater will be done in a manner such that ponding of water is avoided.
- Water consumption will be monitored during the construction stage and records will be maintained to avoid any wastage.
- Establish lined, fenced landfills or use municipal facilities (where available) for biodegradable and inert waste; secure sites to prevent scavenging and animal entry.
- Treat medical waste from first-aid/dispensary as hazardous and send to authorized medical facilities for incineration or another approved disposal.

- Within the camp area, all solid wastes will be stored in the waste bins provided within the camp area and the waste disposed of regularly. The waste will be transported to disposal points in well maintained, designated, and covered vehicles;
- The contractor shall submit a plan for treatment using septic systems to PDSC during mobilization for approval. The plan must include designs or specifications demonstrating that the treatment rate of the system exceeds the loading rate, maintenance of the system, proposal for treatment, and disposal of sludge from septic tanks;
- An adequate and reliable supply of safe drinking water shall be made available at readily accessible for drinking;
- The Contractor will install his tube wells or hand pumps for the supply of water for consumption. These arrangements shall be made at least 500m (1,640 ft.) away from communities' areas.
- The contractor shall be required to install water purifiers systems at drinking water sources (tube wells or hand pumps to have clean water for consumption;
- The drinking water quality testing shall be carried out by the contractor before supply for consumption;
- And if water is found fit for drinking, and following is fitness, the water quality testing shall be carried out on a bi-weekly basis for the first two months, and then quarterly basis to ensure that water is still healthy for drinking and consumption;
- In case, the drinking water is not found healthy for drinking at any stage, the contractor shall be required to out-sourced drinking from a registered company with the GOP, and which shall meet the requirements of NDWQs.

To mitigate these risks, the ESMP requires the Contractor to:

- Implement **erosion and sediment control** measures (silt fences, sedimentation pits, controlled runoff),
- Store fuels and chemicals in **bunded areas** with spill kits and trained personnel,
- Establish designated **washing/refueling areas** away from water bodies,
- Provide on-site sanitation (septic tanks/soak pits) designed to prevent contamination of shallow groundwater, and carry out periodic surface and groundwater quality monitoring against NEQS.

With these controls, residual impacts on surface and groundwater quality are expected to be **low and manageable**.

6.6.8 Fauna

Construction activities, vehicle movement, noise and lighting may temporarily disturb mammals, birds and reptiles in the vicinity, with risks of accidental injury or mortality (e.g. animals struck by vehicles). Poor waste management may also attract or entangle fauna.

Table 6-20: Impact characterization – Fauna

Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance
Direct	Short to medium term (limited to construction period)	Reversible as fauna can return once disturbance ceases	Likely without controls	Moderate	Medium adverse (pre-mitigation)

Mitigation measures

- Environmental Officer to survey work areas prior to major earthworks to identify any nests, dens or significant fauna use; adjust work methods where needed.
- If active nests/dens are found, stop work within at least 50 ft, fence the area and notify the Engineer/PIU; seek ecologist advice on appropriate protection or relocation.
- Restrict construction working hours to 06:00–18:00 to reduce night-time disturbance.
- Enforce a strict ban on hunting, trapping or poaching by project staff; include provisions in worker Code of Conduct.
- Manage solid and food waste to avoid attracting wildlife; prohibit open dumping.
- Apply soil and water-pollution prevention measures to avoid indirect impacts on aquatic and terrestrial fauna.
- Include a simple fauna conservation plan as part of the C-ESMP, based on ECoP guidance in Annexure C.

With these measures in place, impacts on fauna are expected to be **low to medium, localized and reversible**, with no significant long-term effects on wildlife populations.

Dismantling of Associated Facilities

Following the completion of construction activities under Jalal Khan flood dispersal/weir, the contractor will also dismantle and remove from the sub-project area all temporary facilities associated with the works, including camps and batching plant. These dismantling and demolition may have some environmental impacts such as; risk due that improper solid waste handling and disposal poses to human health and environmental degradation, surface and groundwater pollution, and waste is eaten by faunal species while in search of food. The proposed waste disposal system is summarized in the table below.

Table 6-21: Proposed Waste Disposal System

Type of Waste	Description	Disposal Method
Workshop waste including solid and fluid	Used oil, ferrous /nonferrous materials, batteries, etc	Handling by certified recycling Contractor.
Excess construction material	Sand, aggregate, cement, bricks, reinforcement steel	To be sold back or given to the supplier or other users.

	bars, paints, and other construction materials.	
Medical waste	Syringes, glass bottles, bandages, blood sampling tubes, expired drugs, dressing, etc.	To be incinerated at a nearby hospital incinerator, if any, or an equivalent facility.
Packing waste material	Paper, plastic, textiles, cardboard, rubber, wood, glass, tin cans, etc.	Recyclable waste to be handed over to recycling contractors. Combustible waste to be burned in a burn pit or incinerator.
A campsite domestic waste	Biodegradable: Foodstuffs, fruits, and vegetables, wood, bones, grass, etc.	Biodegradables: Composting/burying in the ground
Non-Biodegradable Waste	Paper, metals, glass, plastic bottles, scrap metal, textile and shoes, bottles and jars, fluorescent tubes.	Non-Biodegradable: Recycling or Incineration. Non-recyclable or non-combustible waste should be buried in a designated sanitary landfill to be built by Contractor as per the design approved by the Engineer
Sewage and greywater	Kitchen and washing areas sewage	Sewage and greywater to be disposed of after treatment.

The impact has been characterized in the following table.

Table 6-22: Impact of Characterization-Dismantling and Demolition of Structure and Facilities

Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance
Direct	Short term	Reversible	Certain	Low	Low Adverse

Mitigation

The following mitigations shall be adopted during the demolition and dismantling operations:

- Excess construction material waste shall be minimized through careful planning by the Contractor;
- Construction waste could be reused as fill material or construction material. However, testing should be undertaken to confirm the suitability of any material before its use in construction.

- Demolition waste shall be reused in construction activities (such as for aggregate, landscaping, road formation of katcha routes, and filling of ditches or low-lying areas).
- Wastewater from the construction site shall be collected and treated as per the Contractors Pollution Control Plan before being released in a manner and after the approval by the PDSC.
- The contractor shall comply with air quality requirements as set by law (NEQS) and shall not burn any materials which may lead to the release of toxic or hazardous substances.
- All scattered leftover construction material shall be removed from the construction area and disposed of properly as early as possible in consultation with the engineer.

6.6.9 Social Impacts and Proposed Mitigation Measures

Possible Positive and Economic Impacts

Following are the potential positive social impacts of the sub-project:

- No negative livelihood impact on any vulnerable groups (poor women, single women living alone, elderly, infirm or ill, orphans, etc.)
- No water rights will be changed.
- No economic displacement of local communities.
- Increase in skilled/unskilled job opportunities for area residents Skilled/unskilled job opportunities to a villager will be increased.
- No change in the alignment of weir and channels, therefore, no requirement of community-owned land.
- Improved irrigation system. This benefit will be direct, through the construction of the damaged areas of the **Jalal Khan**, which will result in reducing the issues of sedimentation and water storage. Agriculture lands at the tail end will be more beneficiary for this improved irrigation system.

6.6.10 Impediment to Community Movement

Community disturbance will potentially be created because of an increased volume of traffic expected within the sub-project area. This, in turn, will lead to congestion on transport routes causing delays to local traffic. The contractor will use existing main roads which are all used for transportation/communication purposes by the local communities. The main impact will arise due to the use of existing roads that pass through or are adjacent to major settlements.

Table 6-23: Impact Characterization-Impediment to Community Movement

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

Mitigations

- The project has a grievance redressed mechanism in place to address community complaints and resolve these in a timely and effective manner.
- Details of transport and medical treatment e-route are to be included.

- A complaints register shall be placed at the Contractor's, PIU and consultant Engineer's offices to address complaints.
- Where appropriate, the local authorities responsible for health, religious and security matters shall be duly informed on the set up of camp facilities to maintain effective surveillance of public health, social impacts, and security.
- The contractor's traffic management plan shall include plans for the emergency transfer of members of the public to suitable medical facilities in the event of a serious accident due to the construction works.
- The contractor shall also submit a training plan to the Engineer for approval – this plan must include training of drivers.
- All drivers engaged by contractors must hold a valid license for the vehicle they are operating, and a speed limit of 15km/hr on-site roads shall be enforced.
- The contractor shall provide warning signage where access routes pass adjacent to settlements or schools.
- The contractor shall provide flag persons where construction plant and vehicles cross, or join, main roads in the sub-project area to ensure project traffic merges safely with public traffic. Signage and flagmen are to be provided by the contractor to direct public traffic whenever it is necessary to partially close any public road.
- The blockage of local roads and routes will be minimized. If unavoidable, consultation with the concerned communities will be carried out and alternate routes (by-passes) shall be identified.

Residual Impact

Through the implementation of these mitigation measures, the impact significance will be reduced to low adverse during the construction phase, and neutral following completion of works.

6.6.11 Labor Influx

The construction of the proposed Jalal Khan Flood dispersal/weir and allied structures is expected to require approximately 200 to 300 laborers. Of these, around 5% to 6% will be skilled workers at any given time, with personnel being replaced periodically depending on the nature and phase of work. Priority will be given to local inhabitants for both skilled and unskilled labor opportunities. It is anticipated that about 75% of the unskilled workforce will be sourced from the sub-project area, while the remaining 25%, primarily skilled labor, may be recruited from outside if not available locally.

The provision of temporary employment opportunities is likely to contribute to a reduction in local poverty levels. Increased employment will also help enhance the skill base of the local workforce. However, the influx of labor from outside the community may place pressure on local resources. Additionally, differences in behavior and social practices may lead to tensions between the local community and the contractor's workforce if not properly managed.

Mitigations

- Priority will be given to locals for skilled and unskilled jobs.
- A rigorous age-verification process will be implemented. The CC must maintain a "Labor Registry" including copies of Computerized National Identity Cards (CNICs) or birth certificates for every worker. No person under the age of 18 shall be employed for any hazardous or heavy construction activities.
- If the local socio-economic context necessitates the employment of young persons (above the age of 14 but under 18), they shall be strictly limited to "Soft/Light Work" only. This is defined as work that is not harmful to their health, safety, or development and does not interfere with schooling. These may include site office assistance, serving tea/water, light cleaning of non-hazardous areas, or acting as a messenger/helper for administrative staff.
- Adequate training to migrant labor will be provided on the cultural norms of the local community.
- The Contractor will employ a full-time qualified Human Resource Officer for the project who is conversant with the Ministry of Labor and Manpower laws and their objectives related to Priority will be given to mitigate the risk of gender-based violence, sexual exploitation, and abuse.
- The Camp will be located at least 500 m (1,625 ft.) away from the population.

The Contractor shall ensure that:

- Shelters are built for safety and privacy (e.g. alternative lighting when no power, secure locks/windows, and mosquito net etc.)
- Appropriate transportation for vulnerable groups.
- Inequality, discrimination, and marginalization, including on the bases of gender and or vulnerability, is avoided.
- Establish security patrols and provided details in the C-ESMP.
- Formulation of a progressive and dynamic Labor and Manpower Policy
- Human Resource Development, focus on training and skill development
- Respect for human rights, gender balance, eradication of child and bonded labor
- Promotion of dignity of 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
- Workers will also be provided easily understandable information, regarding their rights under national labor and employment law, rights related to hours of work, wages, overtime, and compensation.
- Culturally appropriate consultation mechanisms are followed by the contractor.

6.6.12 Supply Chain Screening and Spot Audits

The Project may require procurement of construction materials and goods from primary suppliers, including but not limited to aggregates, sand, gravel, cement, steel, pipes, and other construction inputs. Considering the contextual risks associated with labor management in supply chains within the project area, the Project will implement primary supply chain screening procedures in accordance with the Project's Labor Management Procedures (LMP) and the requirements of ESS2.

The Contractor shall ensure that all primary suppliers comply with applicable national labor laws and the provisions of the Project LMP related to:

- prohibition of child labor and forced labor;
- non-discrimination and equal opportunity;
- occupational health and safety (OHS);
- fair treatment and working conditions; and
- availability of grievance mechanisms for workers.

Prior to engagement, contractors shall conduct basic due diligence and screening of primary suppliers to identify any material risks related to labor rights violations, unsafe working conditions, forced labor, child labor, or significant environmental non-compliance.

Where suppliers are identified as high-risk based on the screening process, the Project Implementation Unit (PIU), Supervision Consultant, or designated safeguard staff shall undertake periodic spot checks and/or audits of supplier facilities and practices. Corrective actions shall be required where non-compliance is identified, and repeated serious violations may result in suspension or replacement of the supplier.

Records of supplier screening, monitoring, corrective actions, and audits shall be maintained by the Contractor and made available to the PIU upon request.

Supply Chain Risk Level	Screening Action	Audit Frequency	Responsible Party
High Risk (e.g., quarries, informal suppliers)	Full due diligence, CoC signing, disclosure of subcontractors	Quarterly	PIU Safeguard Officer and Contractor
Medium Risk (e.g., transport, local vendors)	Basic compliance check, CoC signing	Quarterly	Contractor HR + Safeguard Team
Low Risk (e.g., formal suppliers with certifications)	CoC signing, compliance declaration	Spot checks only	Contractor Procurement Unit

6.6.13 Disturbance to Community Mobility

An increase in traffic is expected within the sub-project areas, resulting in disturbance in routine flows of traffic on the existing transport routes causing delays to local mobility. The contractor will utilize existing roads that are all used for transportation/communication by the

local communities. The main impact will arise due to the use of existing roads which pass through or adjacent to major settlements and bypass area.

Mitigation Measures

- Site specific traffic management plan will be developed by the contractor.
- The contractor will locate its camps in which Laborers will reside overnight, at least 500 m (16,25 ft.) away from communities to avoid social conflict in using the natural resources such as water or to avoid the possible adverse impacts of the construction camps on the surrounding communities, such as traffic noise.
- The contractor will also submit a training plan to the supervisory consultant for approval – this plan must include training of drivers.
- All drivers engaged by contractors must hold a valid license for the vehicle they are operating, and a speed limit of 15 km/hr on-site roads will be enforced.
- The contractor will provide warning signage where access routes pass adjacent to settlements or schools.
- The contractor will provide flag persons where construction plant and vehicles cross, or join, main roads in the sub-project area to ensure project traffic merges safely with public traffic. Signage and flagmen are to be provided by the contractor to direct public traffic whenever it is necessary to partially close any public road as proposed project area is closed to the main road and bypass.
- The blockage of local roads and routes will be minimized. If unavoidable, consultation with the affected communities will be carried out and alternate routes (by-passes) will be identified and advertised.

Residual Impact

Through the implementation of these mitigation measures, the impact significant will reduce to moderately adverse during construction work. Following the completion of works impact significance will reduce to neutral.

6.6.14 Gender-Based violence or Sexual Exploitation and Abuse

Due to the influx of labor, there is a risk of potential 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). 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.

Table 6-24: Gender-based violence or sexual exploitation and abuse

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

Mitigation

- Adequate training to especially migrant workers will be provided on the cultural norms of the local community.

- 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 behaviours (guidelines are given below):
- Inequality, discrimination, and marginalization, including on the bases 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. These training will be organized for the contractor and supervisory consultant staff, and it will be the responsibility of the Contractor. As per the need, the contractor will higher services of qualified Health and Safety Officer who will also be responsible for GBV & SEA through an agreement that will be signed between the contractor and HSC, under the supervision of Enviormental Officer/Coordinator Social Specialist of the supervisor consultant. At the end of each session/event, the HSE will produce a event report and other relevant material, submit to the concerned section of Supervisory consultant with a cumulative report to PIU. This process will complete under the overall supervision and monitoring of Social Safeguard Specialist and Gender Specialist of of PIU sitting there for this purpose.

The bidders will be required to submit Codes of Conduct as outlined in the bidding document 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.

- CoC will specify respect for the local community and its cultural norms
- Presentation of professional behaviour 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 behaviour such as sexual harassment, gender-based violence, and sexual abuse is strongly prohibited.
- Zero tolerance any form of harassment, bullying or other offensive physical or verbal treatments;

Further detail gender inclusion plan and GAP for **Jalal Khan** flood dispersal/weir structure has been provided in Annexure-I.

6.6.15 Archaeological and Cultural Heritage Site

As per the initial screening/assessment, there is no archaeological and cultural heritage site at the proposed sub-project area of **Jalal Khan** flood dispersal/weir structure works. However, in the event of any discovery of an unidentified archaeological or cultural heritage site, following a chance finding procedure as given in Annexure-D will be implemented.

On the discovery of archaeological or cultural resources, the contractor will stop work in the area immediately. The Contractor will inform the Supervisory consultant and PIU of the discovery immediately. Immediately, the contractor will submit a brief report with photographs and a layout plan, identifying the location of the known resource to the Supervisory consultant and copy it to Project management Unit.

In case of any chance find in terms of cultural heritage, the requisite Cultural Heritage Management Plan will be prepared and accordingly procedures will be followed.

6.6.16 Physical Resettlement

Based on the current design and scope, the proposed **Jalal Khan** flood dispersal/weir structure Works will be implemented along the existing alignment, with no deviation from the

original design. Therefore, no physical resettlement is anticipated, and no residential or commercial structures will be affected.

6.6.17 Land Acquisition

The 14 parcels of land have been acquired from the 14 various farmers for the construction of the **Jalal Khan** Flood dispersal/weir structure Works and two distributary channels. The 60.68 acres in bit and pieces of provided land will be used for the construction of scheme. The entire area is a barren land and is free from encroachment, economic, and residential use.

The land needs and how these will be met have been determined keeping in view the final design and alignment along with the Board of Revenue (BOR) cadastral record. The PIU team obtained the cadastral record from the district revenue department office and calculated the land needs. As land needs are being met through VLD. Established VLD protocols (specified in the project's Approved RPF) have been followed to ensure that the process remains transparent and genuinely voluntary. The documentation process was completed to record the following:

- Ownership of land and evidence indicating the voluntary nature of the donation;
- Appropriateness of the donation for the intended purpose
- No encumbrances on the land
- No negative livelihood impact on any vulnerable groups
- No compensation to be paid

The owners give up all claims on the land several rounds of consultation led by FO, accompanied by the PIU social team, were held with land owners in which the sub-project development and need for land through the VLD process were explained. The agreement on VLD was done on stamp papers with due attestation by the Tehsil Revenue Officer (Tehsildar). This record would be sent to the Assistant and Deputy Commissioners of the area. The copies of such agreements will also be provided to affected landowners and concerned FOs. A record of VLDs in hard and soft (scanned) will be maintained in the PIU and concerned district/tehsil revenue office. All the activities would be monitored by the PIU social safeguards staff. The assessment record and signed agreement between all stakeholders is provided in Appendix ---.

6.7 SOCIAL AND CULTURAL IMPACTS

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

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

- **Cultural Sensitivity and Lifestyle Shifts:** The presence of non-local workers may introduce different customs, languages, and social behaviours, which could lead to misunderstandings or discomfort among local populations, particularly in conservative or close-knit communities.
- **Potential for Social Tensions:** In rare cases, disputes may emerge due to differences in work ethics, communication barriers, or perceived inequities in employment opportunities. These tensions, if not managed proactively, could affect community cohesion.
- **Pressure on Local Resources:** A temporary increase in population may place additional demand on local water sources, sanitation facilities, and communal infrastructure, especially in smaller or resource-constrained settlements.

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

Mitigation Measures

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

- **Cultural Orientation for Workers:** Contractors shall provide basic orientation sessions to all incoming workers on local customs, traditions, and community expectations to promote mutual respect and minimize cultural friction and relevant trainings as mentioned in section-6
- **Code of Conduct:** A clear and enforceable Code of Conduct shall be implemented for all site personnel, emphasizing respectful behaviour, prohibition of harassment, and obedience to local norms.
- **Grievance Redress Mechanism (GRM):** the project GRM/LGRC shall be displayed to allow community members to voice concerns or complaints related to social interactions or workforce behaviour.
- **Community Engagement:** Regular consultations and information-sharing sessions with local stakeholders shall be conducted to maintain transparency, trust, and ensure that any emerging issues are addressed on time.

7

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

7. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The Environmental and Social Management Plan (ESMP) sets out the framework for identifying, mitigating, monitoring and managing environmental and social risks and impacts associated with rehabilitation and strengthening of the Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin. This ESMP translates the requirements of the World Bank ESF/ESSs and Relevant national and provincial regulations into practical measures and responsibilities for the PIU, contractors and supervision consultants.

The ESMP is designed to ensure that the flood-protection sub-project is implemented responsibly, minimizing negative environmental and social impacts while maximizing benefits for local communities. By integrating risk management, climate-resilient design and stakeholder engagement, the ESMP supports sustainable operation of the flood dispersal structure as a reliable and safe flood-protection lifeline, even under future climate-related extremes.

7.1 OBJECTIVES OF THE ESMP

The main objective of the ESMP is to define clear environmental and social objectives, performance standards and implementation arrangements that ensure a sustainable and climate-resilient approach to project construction and operation. Specific objectives, many of which translate into contractual obligations for the contractor, include:

- **Familiarity with World Bank safeguard requirements:** Ensure that the contractor and key project staff understand and comply with the World Bank Environmental and Social Framework, the Environmental and Social Commitment Plan (ESCP) and relevant guidelines and standards.
- **Site selection for facilities:** Guide the environmentally sound siting and layout of project facilities (camps, workshops, batching plants, machinery yards, borrow areas) in accordance with the country's environmental and social legislation, ESMP criteria and World Bank requirements.
- **Institutional arrangements and human resources for ES compliance:** Specify the environmental and social staffing requirements for the PIU, PDSC and contractor to enable effective ESMP implementation, supervision and reporting.
- **Mitigation of impacts:** Define mitigation measures for each key activity so that adverse impacts, especially relating to air quality, soil contamination, pollution of water resources, loss of habitat, OHS, community health & safety and disruption to wildlife are avoided or minimized and positive project benefits are enhanced wherever possible.
- **Climate-resilient infrastructure:** Promote integration of grey and green solutions and other climate-resilient features into design and construction, ensuring that the dispersal structure performs safely and reliably under future hydrological extremes.

- **Clear roles and responsibilities:** Clarify the liabilities and duties of all project actors, including the contractor's Environmental/Social and OHS staff and the supervisory consultant's ES specialists.
- **Environmental and social training:** Identify the scope and frequency of environmental, social, OHS and community-relations trainings required for contractor personnel, PIU staff and PDSC staff.
- **Environmental and social budgeting:** Provide cost estimates and budget allocations for ESMP implementation, monitoring, training and capacity building.
- **Documentation, communication and reporting:** Establish procedures and formats for routine ES reporting, record-keeping, internal communication and disclosure during all project phases.
- **Inspection and supervision:** Set out inspection and monitoring frequencies and responsibilities for the Construction Contractor (CC), Project Design and Supervision Consultant (PDSC), Irrigation Department Balochistan and the World Bank to verify ESMP compliance.
- **Environmental and social monitoring and management plans:** Present the Environmental and Social Mitigation and Monitoring Plan (Table 7-4) and related instruments that specify performance indicators, monitoring methods and corrective-action processes.
- **Contractor-ESMP (C-ESMP):** Require the contractor to prepare and implement a site-specific C-ESMP that operationalizes this ESMP and includes, at a minimum:
    - Campsite Management Plan (with layout and services)
    - Waste Management Plan (solid and liquid)
    - Occupational Health and Safety Plan (including communicable-disease and COVID-19 provisions as relevant)
    - Emergency Preparedness and Response Plan
    - Traffic Safety and Diversion Management Plan
    - Pollution Prevention Plan
    - Contractor's Code of Conduct

7.2 ROLES AND RESPONSIBILITIES FOR ESMP IMPLEMENTATION

Effective implementation of the ESMP depends on clear allocation of roles, responsibilities and lines of accountability among all project actors. This section outlines the institutional arrangements for environmental and social management, describing the core functions of the Project Implementation Unit (PIU), Project Design and Supervision Consultant (PDSC), Construction Contractor (CC), and other relevant agencies in planning, implementing, supervising and reporting on ESMP measures.

The PIU retains overall responsibility for ESMP oversight and compliance with World Bank ESF and national regulations, while the contractor is responsible for day-to-day implementation of mitigation and monitoring measures through a site-specific C-ESMP. The

PDSC provides independent supervision and technical support, verifying ESMP implementation on site and advising on corrective actions where gaps are identified. Subsequent subsections and tables specify the key tasks, staffing requirements and reporting lines for each entity during pre-construction, construction and operation phases.

Implementation of the ESMP will be ensured by PIU to remain aligned with overall BWSPIP institutional arrangements.

7.2.1 Provincial Level

At the provincial level, the BWSPIP Project Implementation Unit (PIU) is responsible for day-to-day implementation of sub-projects, including this ESMP. The PIU's E&S staff, supported by district and field-level E&S FPs, will implement the ESMF/ESMP, supervise contractors and operate the E&S monitoring and reporting systems. E&S staff of the PIU will report to the Project Director and maintain close liaison to ensure consistent application of E&S requirements and timely escalation of any significant issues. The PIU E&S Team will use standard monitoring checklists and tools to verify compliance and to support adaptive management.

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

7.3.1 Construction Contractor (CC)

- The contractor will prepare a site-specific Contractor ESMP (C-ESMP), for approval prior to commencement of construction.
- The contractor will develop and implement detailed management plans consistent with this ESMP, covering OHS, traffic management and diversions, camp management, solid and liquid waste, community health and safety, emergency response, air quality, noise and dust.
- The Contractor will select locations for camps, machinery yards, borrow/waste disposal areas and other facilities in accordance with ESMP siting criteria and obtain required approvals.
- The contractor E & S will organize quarterly (or more frequent) trainings for workers and staff on environmental and social requirements, OHS, communicable diseases, community privacy and ESMP implementation.
- The contractor ES will engage accredited laboratories to conduct environmental testing and monitoring on at least a quarterly basis, or as specified in the monitoring plan.
- The EE will supervise day-to-day ESMP implementation on site, ensure corrective actions are taken where non-compliances are identified and maintain relevant records.
- The contractor will submit monthly Environmental, Social, Health & Safety performance reports to the PDSC/PIU in accordance with the templets specified in the ESMP.

- The contractor will ensure provision and proper use of appropriate PPE, and will train workers in fire-fighting, emergency procedures and safe evacuation.

7.3.2 Contractor's Organizational Framework

The contractor will submit an organizational chart highlighting E&S and OHS roles and will nominate a senior manager with overall responsibility for ESMP compliance. The contractor will submit the curriculum vitae of its ESMP staff to the Project Design Supervision Consultant (PDSC) in coordination with PIU for review and approval. The availability of the contractor's ESMP staff will be made full time on site. Key minimum positions include:

- Environmental Officer
- Safety Supervisor
- Paramedic staff
- Health and Safety Officer
- Human Resource Officer
- Community Liaison Officer

All E&S/OHS staff must have at least 3–5 years of experience in EHS compliance and reporting on donor-funded infrastructure projects and meet the qualification requirements set out in the bidding documents and this ESMP.

The staffing positions listed above – Environmental Officer, Safety Supervisor, Paramedic, Health and Safety Officer, HR Officer, and Community Liaison Officer – must be included in the Contractor's BOQ as named cost line items with defined man-month inputs. The same positions and staffing levels must be reflected in the bidding documents as mandatory contract requirements. Any Contractor bid that does not include these positions with adequately costed man-months will be treated as non-compliant during technical evaluation. The PDSC must verify that the Contractor's staffing plan matches the BOQ before issuing a Notice to Proceed.

7.3.3 Project Design and Supervision Consultant (PDSC)

The Project Design and Supervision Consultant (PDSC) shall support the PIU in supervising ESMP implementation during pre-construction and construction. The PDSC shall review the Contractor's C-ESMP and associated management plans, verify field compliance, inspect work areas and camps, review monitoring data and incident records, advise on corrective actions, and promptly escalate material non-compliance to the PIU for decision and enforcement.

- Review and clear the C-ESMP and associated management plans prior to the start of works; ensure they are fully aligned with the ESMP and World Bank requirements.
- Supervise and monitor ESMP and C-ESMP implementation on site, including regular inspections of work areas, camps, borrow areas, quarries and ancillary sites.

- Ensuring that the day-to-day construction activities are carried out in an environmentally and socially sound and sustainable manner;
- Prepare monthly and quarterly Environment, Social, Health & Safety (ESHS) compliance reports for submission to the PIU and the World Bank within agreed reporting templets and timelines.
- Maintain strong coordination with the Contractors and E&S Specialists- PIUs.
- Notify the PIU and World Bank of any serious incident or accident within 48 hours and provide a follow-up incident report, including corrective actions, within 30 days.
- Develop corrective action plans where non-compliances are identified and monitor their implementation by the contractor.

- Conduct periodic internal E&S audits (at least every six months) to assess ESMP implementation and recommend improvements.
- To organize periodic E & S training programs and workshops for the relevant E&S Specialists including PIUs and contractor.

7.3.4 Project Implementation Unit (PIU)

- Provide overall oversight, technical support and quality control to field E&S FPs and PDSC teams responsible for ESMP implementation.
- Review and approve E&S screening checklists, ESMPs and related instruments for sub-projects, and maintain organized documentation of E&S performance.
- Oversee implementation and monitoring of E&S mitigation and management measures, consolidate progress from all sub-projects and submit quarterly E&S reports to the World Bank.
- Organize and deliver capacity-building and training for field staff, contractors and community representatives on ESF requirements and ESMP provisions.
- Ensure all bidding and contract documents incorporate relevant E&S clauses, screening checklists and ESMP obligations.
- Verify that proposed activities do not fall under the project's exclusion list and that any changes in scope are screened for E&S risks.
- Maintain close liaison with the World Bank, relevant government departments, field-level E&S FPs to support smooth and effective E&S implementation.
- Recruit Third Party Validation (TPV) to monitor effectiveness, efficacy and soundness of processes and procedures adopted for and related to: environmental assessment of subprojects, identification of risks and impacts and compliance monitoring at all levels.
- Operate and track the project Grievance Redress Mechanism, ensuring that grievances and beneficiary feedback are used as a monitoring tool and that serious incidents are reported to the World Bank within 48 hours.
- At completion of works, verify that all E&S mitigation measures, site restoration and landscaping have been properly implemented and that sites are restored to at least pre-project condition before contract closure.

7.3.5 Training and Capacity Building

The contractor will organize regular skill-development and awareness sessions to maintain staff and workers. Training shall include induction training before mobilization, periodic refresher sessions, and task-specific toolbox talks covering environmental management, OHS, PPE, emergency response, waste handling, camp management, community conduct, GBV/SEA-SH prevention, grievance procedures, and chance-find requirements. At least one week of job-specific skill-development training will be provided during mobilization, with refresher trainings and toolbox talks conducted throughout construction.

Key training areas will include but not limit to:

- **Communication skills:** Effective communication with supervisors, co-workers and community representatives to ensure that instructions, safety information and changes in work plans are clearly understood and implemented.
- **Teamwork skills:** Working cooperatively in crews so that tasks are coordinated, conflicts are minimized and productivity and safety are improved.
- **Time-management skills:** Planning and sequencing work to meet deadlines, manage time-sensitive activities (e.g. concrete works) and reduce delays on site.
- **Technical skills:** Practical competencies in manual and mechanical excavation, stone masonry, concrete works, formwork, installation of project structures and safe use of tools and equipment.

Strengthening the capacity of project staff and workers is essential for effective implementation of the ESMF and ESMP and for sustained compliance with E&S mitigation measures. This will be achieved through a series of customized trainings and awareness sessions, as summarized in the training and capacity-building framework in Table 7-1.

Table 7-1: Training and Capacity-Building Framework for the Sub-Project

Sr. No.	Key Areas	Key Aspects to Cover	Potential Participants	Frequency of Training	Responsibility
1	E&S Orientation / Awareness	E&S awareness; World Bank Environmental and Social Standards (ESSs); OHS and CHS aspects; Relevant national/provincial E&S legal requirements; ESMF findings; ESMP and its components; GBV and GRM; reporting of incidents/accidents; emergency preparedness and response; Labor Management Procedures; resettlement and land acquisition provisions.	BWSPIP project staff, including Implementing Partners	At project start; refreshers on a bi-annual basis or as required.	Environmental, Social and Gender Specialists, BWSPIP

Sr. No.	Key Areas	Key Aspects to Cover	Potential Participants	Frequency of Training	Responsibility
2	GBV / SEA / SH	Prevention of GBV/SEA/SH; workers' Code of Conduct; survivor-centered response; use of GRM for GBV/SEA/SH complaints; confidentiality and referral pathways.	BWSPIP project staff, including Implementing Partners	At project start; refreshers on a bi-annual basis or when required.	Social and Gender Specialists, BWSPIP
3	ESMF / ESMP Implementation	ESMF components; key steps for ESMP implementation; use of screening and field checklists; GRM and GBV linkages; ESMP/C-ESMP implementation roles; documentation and reporting requirements.	BWSPIP project staff, including Implementing Partners	At project start; refreshers on a bi-annual basis or as required.	Environmental, Social and Gender Specialists, BWSPIP
4	E&S Management and Community Outreach	E&S mitigation plans; stakeholder mapping and engagement; OHS and CHS aspects; sensitization of women beneficiaries on cash-grant support and construction of multi-hazard-resilient houses; awareness on GRM and disaster preparedness; emergency prevention, preparedness and response planning;	BWSPIP project staff; Implementing Partner staff; masons' and community groups; women beneficiaries	At project start; then on-going / informal sessions and refresher trainings during implementation.	Environmental, Social and Gender Specialists, BWSPIP; Gender FPs (Implementing Partners)

Sr. No.	Key Areas	Key Aspects to Cover	Potential Participants	Frequency of Training	Responsibility
		resource efficiency and pollution prevention and management.			

The major construction activities that will be undertaken as part of the sub-project, and which are the focus of the training and capacity-building program, are summarized in Table 7-2.

Table 7-2: Construction Activities

Sr. No.	Construction Activity
(i)	Masonry
(ii)	Electrical works
(iii)	Framing
(iv)	Concrete works
(v)	Excavation
(vi)	Environmental codes and practices
(vii)	OSHA safety requirements
(viii)	Reading and interpreting drawings
(ix)	Erecting / structural assembly
(x)	Crane and rigging operations
(xi)	Operation of construction equipment
(xii)	Use of power tools

7.4 REPORTING AND DOCUMENTATION

7.4.1 Meetings

A preliminary meeting will be held with the aim of setting out the format for the regular meetings. This meeting will be held before the commencement of the works, following the contract award. The meeting will be attended by PIU/PIU, consultant, and the contractor.

7.4.2 Communications

Most communications between supervisory consultant and the contractor will be verbal on site. Where such verbal communication proves to be ineffective for an issue, the environmental team of the supervisory consultant will issue a formal instruction to the contractor under the civil works contract. Such instructions will also be copied to PIU, as the Employer.

7.4.3 Reporting Frequency

The Contractor and supervisory consultant will produce monthly reports detailing the compliance level and non-compliance with this ESMP. The distribution list of reports is given in the below table.

Table 7-3: Details of Reports

Sr. No	Report	Prepared by	Frequency	Reviewed by	Distribution
1.	Monthly ESHS Monitoring Report	Supervisory consultant	Monthly	ES PIU/PIU	PIU, Contractor
2.	Monthly Contractor's Compliance Report	Contractor	Monthly	ES team of PIU	PIU & Supervisory consultant
3.	Monthly M&E ESHS Monitoring Report	M&E Consultant	Monthly	ES PIU	PIU and World Bank by PIU.
4.	Quarterly ESHS Progress Report	Supervisory consultant	Quarterly	ES PIU	PIU and World Bank by PIU

7.4.4 Pictorial Record

A photographic record of the sub-project locations shall be kept and taken at key locations in a walkthrough a survey by the contractor, consultant and PIU. The photographic record shall be incorporated into the monthly reports. The pictorial record shall include time, the title of the photograph and date.

7.4.5 Complaints Register

The contractor will maintain social complaints registers at all camps and worksites to document all complaints received from the local communities. The register will also record the measures taken to mitigate the reported concerns. The final report will be communicated to the PIU. All complaints/issues of the community will be reported in the monthly progress report for the following month along with the status of the last month's complaints. A separate worker GRM shall operate for all categories of project workers under ESS2, while the community GRM shall remain accessible to affected persons, including women and vulnerable groups, through culturally appropriate and confidential channels.

7.5 INCLUSION OF ESMP IN CONTRACT DOCUMENTS

The approved ESMP for the sub-project will form an integral part of the bidding and contract documents issued by the implementing agency. It will be attached to the Request for Proposals (RFPs) and referenced in the Conditions of Contract so that bidders clearly understand that compliance with all ESMP requirements is mandatory and subject to supervision and performance review.

Technical specifications and Bills of Quantities will explicitly incorporate ESMP-related obligations, including preparation and implementation of the C-ESMP and associated management plans, monitoring, reporting and training. ESMP implementation will be closely coordinated with project design and the construction schedule to ensure that mitigation

measures are applied at the correct stages and that sufficient budget, staff and time are allocated to achieve the required environmental and social performance.

7.6 GRIEVANCE REDRESS MECHANISM (GRM)

7.6.1 General

The Grievance Redress Mechanism (GRM) for **Component A – PIU Balochistan Irrigation Department (BID)** in the Balochistan Water Security & Productivity Improvement Project (BWSPIP) has been established to provide a structured, transparent, and accessible process through which individuals, communities, workers, contractors, and other stakeholders can raise concerns, complaints, queries, or suggestions related to project activities. The mechanism is aligned with the World Bank's Environmental and Social Standard 10 (ESS10), which emphasizes stakeholder engagement and information disclosure.

The GRM is not intended to replace judicial or administrative remedies. Instead, it functions as a complementary system that allows grievances to be addressed quickly and effectively at the project level. By resolving issues early, the GRM reduces the likelihood of disputes escalating into legal proceedings, thereby saving time and resources for both the project and affected communities.

The foundation of this GRM in the second and advanced version which lies on the existing system developed under the Balochistan Integrated Water Resources Management and Development Project (BIWRMDP) in period of 2017-2025. That system had proven effective, with a four-tier structure, multiple submission channels, and a clear 20-day resolution timeframe. Building upon this foundation, the current GRM introduces enhancements tailored to the needs of Component A, ensuring that grievances are managed independently by the PIU of the Irrigation Department while maintaining accountability to the World Bank.

7.6.2 Objectives of the GRM

The primary objective of the GRM is to ensure that grievances are resolved in a timely, fair, and transparent manner. This overarching goal is supported by several specific objectives.

1. The GRM provides accessible avenues for primary and secondary stakeholders to raise their concerns. Accessibility is critical in a province like Balochistan, where communities may be geographically dispersed, literacy levels may vary, and cultural sensitivities must be respected. By offering multiple channels such as, hotlines, SMS, email, WhatsApp, complaint boxes, and in-person submissions the GRM ensures that no stakeholder is excluded from the process.
2. The mechanism guarantees fairness and impartiality. All grievances, regardless of the complainant's identity or social status, are treated with equal importance. This principle is particularly important in rural areas where marginalized groups, including

women, minorities, and differently abled persons, may otherwise struggle to have their voices heard.

3. The GRM promotes transparency and accountability. Every grievance is logged in a centralized database, assigned a unique reference number, and tracked through each stage of the process. This ensures that complaints cannot be ignored or mishandled without oversight.
4. The GRM builds trust between the project and stakeholders. By demonstrating responsiveness and respect, the PIU fosters cooperation and reduces resistance to project activities. Trust is essential for the long-term sustainability of irrigation schemes, which depend on community support and participation.
5. Finally, the GRM identifies systemic issues and recommends corrective measures. For example, if multiple grievances are received about unsafe labor camps, the PIU can introduce policy reforms to address the root cause. In this way, the GRM not only resolves individual complaints but also contributes to continuous improvement of project operations.

7.6.3 Scope of the GRM

The Grievance Redress Mechanism covers a broad spectrum of issues that may arise during project implementation, ensuring that all aspects of the project are subject to accountability. Environmental grievances are included, such as complaints about dust, noise, water contamination, inadequate waste management or ecological damage caused by construction or irrigation works. Social grievances, including displacement, disruption of livelihoods, or conflicts within communities, also fall within the scope of the mechanism. Matters related to land acquisition are addressed, particularly disputes over compensation, valuation of assets, or delays in payment, which are often sensitive and require careful handling to maintain trust with affected persons.

Labor-related grievances are an important category, as workers and contractors may raise concerns about delayed wages, unsafe working conditions, or inadequate facilities in labor camps. Occupational health and safety issues, such as accidents, lack of protective equipment, or unsafe construction practices, are treated with particular seriousness given their potential impact on human life and wellbeing. Community health and safety concerns are also addressed, including risks such as traffic hazards caused by project vehicles or dangers associated with excavation sites.

Sensitive issues such as Gender-Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH) are managed under special protocols to ensure confidentiality and survivor-centered approaches. These cases are handled with discretion, and survivors are provided with appropriate support services. Finally, grievances related to the conduct of security personnel, including misbehavior, intimidation, or excessive use of force, are also within the scope of the GRM.

By covering environmental, social, labor, health, safety, gender-based, and security-related concerns, the GRM ensures that all stakeholders have a credible and transparent platform to raise issues and seek redress. This comprehensive scope reflects the project's commitment to accountability, fairness, and respect for the rights of affected communities and individuals.

7.6.4 Institutional Structure

The institutional structure of the GRM for Component A is designed to ensure effective management at both provincial and district levels. At the PIU level, the Grievance Redress Committee (GRC) is the central body responsible for overseeing grievance management. The committee is chaired by the Project Director and includes technical experts such as the Environmental Compliance Expert and the Gender Specialist. The Social Safeguard Specialist serves as the Grievance Redressal Officer (GRO), responsible for day-to-day operations of the GRM.

The GRC also includes representatives from key district offices, including the Public Health Engineering (PHE) Office, the Forest Office, and the Office of Water Management (OFWM). An engineer from PISAC is also a member. Co-opted members from other government departments may be included as needed, depending on the nature of grievances.

At the district level, Grievance Focal Person (GFPs) are appointed in each office of the district, working sites and communities. This individuals serve as the first point of contacts for complainants, receiving grievances, assisting with submissions, conducting preliminary reviews, and supporting investigations. GFPs will play a critical role in ensuring that grievances are addressed locally and that complainants do not have to travel long distances to access the system.

The GRO at the PIU is responsible for maintaining the grievance database with the help and support of GFPs, coordinating investigations, and reporting to the World Bank. This ensures that grievances are not only resolved but also documented and analyzed for systemic improvements.

7.6.5 Grievance Uptake

Grievances can be submitted through a variety of channels to ensure accessibility for all stakeholders. A toll-free hotline and a dedicated portion at the project websites are available for immediate reporting, while SMS services provide a simple option for those with limited literacy. Filling online forms, email submissions are accepted, and in-person submissions can be made to GFPs or directly to the PIU-GRC.

Grievance or suggestion boxes are placed at project sites to allow anonymous submissions. Online forms are available on the project website of both PIUs, and postal services provide

an option for those in remote areas. A dedicated WhatsApp number is also provided, recognizing the widespread use of mobile messaging in project focused areas.

By offering such a wide range of channels, the GRM ensures that grievances can be submitted easily and without cost. This inclusivity is essential for building trust and ensuring that even vulnerable groups have access to the system.

7.6.6 Sorting and Processing

This categorization ensures that grievances are addressed proportionately, with urgent issues receiving immediate attention while minor issues are resolved efficiently at the local level.

All grievances are logged within 24 hours of receipt into the online complaint registration system managed by the PIU through the Grievance Redressal Officer (GRO), with support from the Grievance Focal Persons (GFPs). This system captures complaints submitted through the website, social media, and other channels, ensuring that no grievance is overlooked.

Complaints are categorized into three levels of priority: ***low, medium, and high***. Low-priority grievances, such as minor administrative issues or small delays, are resolved at the district level by the GFPs. Medium-priority grievances, including employment-related disputes or moderate environmental and social concerns, are reviewed and decided by the PIU-level Grievance Redress Committee (GRC). High-priority grievances, such as corruption, GBV/SEA/SH cases, serious health and safety risks, or violations of community rights, are escalated to the appropriate higher-level committees, including the Project Steering Committee (PSC), in accordance with the established structure.

This tiered approach ensures that grievances are addressed at the appropriate level, with urgent matters escalated promptly while routine issues are resolved locally and efficiently.

7.6.7 Acknowledgement and Follow-Up

Acknowledgement of grievances is provided within two days of receipt. The Social Safeguard Specialist at the PIU issues an acknowledgement letter or email, or instructs GFPs to convey acknowledgement depending on accessibility. This step is critical for building trust, as it assures complainants that their concerns have been received and are being addressed.

Follow-up is conducted throughout the investigation process, with complainants informed of progress and expected timelines. This transparency ensures that stakeholders remain engaged and confident in the system.

7.6.8 Verification, Investigation, and Action

Once a grievance has been acknowledged, the next step is verification and investigation. This process is critical to ensure that complaints are not only heard but also substantiated with evidence and addressed appropriately.

For low priority grievances, the Grievance Focal Person at the district level conducts the initial verification. This may involve visiting the complainant, reviewing relevant documents, or consulting with local project staff. Because these grievances are minor in nature, they can often be resolved quickly through direct communication or minor corrective actions. If resolution is not possible at this level, the grievance is reclassified as medium priority and escalated to the PIU GRC.

Medium priority grievances require a more thorough investigation. The PIU GRC takes responsibility for these cases, often enlisting the support of GFPs to gather information. Investigations may involve site visits, consultations with contractors, and review of project records. The GRC deliberates on findings and formulates a resolution, which may include corrective action, compensation, or policy adjustments.

High priority grievances demand urgent attention. These include allegations of corruption, violations of law, GBV/SEA/SH cases, or serious health and safety concerns. In such cases, the PIU GRC may form a special committee to conduct the investigation. This committee may include external experts or representatives from relevant government departments. Investigations are conducted with utmost diligence, ensuring confidentiality where required, particularly in cases involving GBV or vulnerable groups. Resolutions are proposed within fifteen working days, and complainants are informed promptly.

Throughout the investigation process, transparency is maintained. Complainants are kept informed of progress, and all findings are documented in the grievance database. This ensures accountability and provides a record for future reference.

7.6.9 Resolution and Closure

Resolution involves identifying and implementing appropriate corrective actions. These may include changes to project design, adjustments in implementation practices, provision of compensation, or disciplinary measures against staff or contractors. In some cases, resolution may simply involve providing a clear explanation to the complainant, particularly if the grievance arises from misunderstanding or lack of information.

Once a resolution is proposed, it is communicated formally to the complainant. This communication may be delivered in writing, by email, or through GFPs, depending on the complainant’s accessibility. The complainant’s satisfaction is sought, and where possible, confirmation of acceptance is recorded.

Closure occurs when the complainant accepts the resolution or when the PIU has taken all reasonable steps to address the grievance. The case is then archived in the grievance database, with all documentation attached. Closure does not mean the grievance is forgotten; rather, it becomes part of the institutional memory of the project, contributing to lessons learned and systemic improvements.

7.6.10 Appeals Process

If a complainant is not satisfied with the resolution, they have the right to appeal. Appeals are submitted in writing within five days of receiving the resolution. The appeal is escalated to the Project Steering Committee (PSC), which is chaired by the Additional Chief Secretary of the Planning and Development Department and includes Project Directors, Secretaries, and heads of relevant departments.

The PSC reviews the grievance, considers the resolution proposed by the PIU GRC, and makes a final decision. This decision is communicated to the complainant within a defined timeframe. The appeals process ensures that complainants have recourse to a higher authority and that grievances are not dismissed without due consideration.

Below is a simplified grievance handling process:

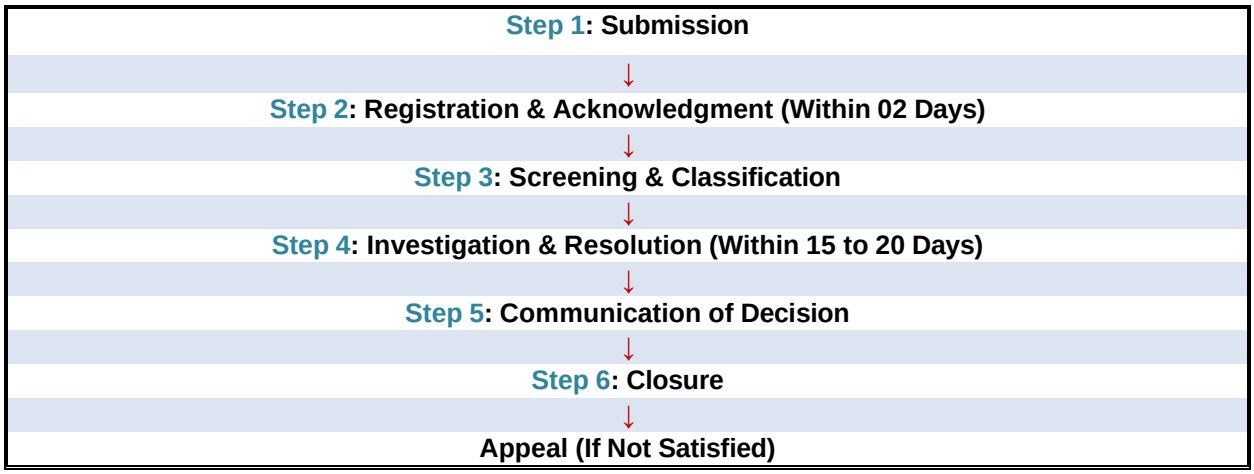


Figure 7-1: Simplified grievance handling process

7.6.11 Monitoring and Evaluation

Monitoring and evaluation are integral to the GRM. Data on grievances is collected in a dedicated grievance management system at the PIU GRC. This data includes the number of grievances received, the percentage acknowledged within the stipulated timeframe, the percentage resolved within fifteen to twenty days, the number of pending cases, and the number of appeals.

Special attention is given to GBV-related cases, although personal data is not disclosed. Systemic issues identified through grievance analysis are documented, and corrective

measures are recommended. Quarterly reports are submitted to the World Bank, providing an overview of GRM performance and ensuring accountability to donors and stakeholders.

Evaluation also involves assessing complainant satisfaction. Follow-up surveys and interviews are conducted to determine whether resolutions were effective and whether complainants felt respected and heard. This feedback is used to improve the GRM continuously.

7.6.12 Capacity Building and Training

Effective grievance management requires trained personnel. Training needs for PIU staff, contractors, and consultants are identified and addressed through regular capacity-building workshops and on-the-job training programs. Training covers topics such as grievance handling, social engagement, environmental compliance, and sensitivity in dealing with vulnerable groups.

Special training is provided for handling GBV/SEA/SH cases, emphasizing confidentiality, survivor-centered approaches, and referral pathways. Training is conducted annually or as needed, ensuring that all personnel involved in the GRM are equipped with the skills and knowledge required to manage grievances effectively and sensitively.

7.6.13 Special Protocols for GBV/SEA/SH

Grievances related to Gender-Based Violence, Sexual Exploitation and Abuse, and Sexual Harassment are handled under special protocols. These protocols ensure that survivors are protected, confidentiality is maintained, and appropriate support is provided.

No written complaint is required for GBV/SEA/SH cases, recognizing that survivors may be reluctant to document their experiences. Complaints are registered confidentially, with restricted access to protect personal data. Immediate referral is made to service providers, including medical, psychosocial, and legal support.

Investigations are not conducted without the informed consent of the survivor. The approach is survivor-centered, prioritizing the safety, dignity, and well-being of the complainant. Separate GBV committees are formed within the PIU to handle such cases, and detailed procedures are outlined in the GBV Action Plan.

By adopting these protocols, the GRM ensures that sensitive cases are managed with discretion and compassion, while still maintaining accountability.

7.6.14 Workers' GRM

In compliance with ESS2 and in line with the approved Labour Management Procedures (LMP), a dedicated Workers' Grievance Redress Mechanism (GRM) will be established to address grievances of both direct and contracted workers. This mechanism ensures that all workers have

accessible, transparent, and confidential channels to raise concerns related to labor and working conditions.

While the overall framework for workers' grievance management is defined in the LMP, the Contractor shall establish and operationalize a **site-specific Workers' GRM through the Contractor's ESMP (C-ESMP)**.

The site-level Workers' GRM shall include the following operational arrangements:

- Designation of a GRM focal point at site level (Contractor's HSE/Social Officer)
- Establishment of physically accessible grievance intake points**,** including site office/help desk and complaint boxes at appropriate locations
- Provision of multiple grievance submission channels**,** including verbal, written, phone, WhatsApp, and anonymous submissions
- Communication of GRM procedures in Urdu, local languages, and languages understood by migrant workers (if engaged)
- Maintenance of a grievance register/logbook with unique identification numbers for tracking
- Acknowledgment of grievances within 2 working days
- Resolution of grievances within 7–15 working days**,** depending on the nature of the issue
- Immediate handling of urgent grievances within 24–48 hours
- Confidential handling of sensitive complaints, including GBV/SEA/SH**,** in line with a survivor-centered approach
- Provision for escalation of unresolved grievances to the PIU-level GRM

All workers will be informed about the Workers' GRM at the time of induction and through regular toolbox talks to ensure awareness and accessibility throughout their engagement.

The Contractor shall maintain records of all grievances and submit monthly reports to the PIU**,** in line with LMP requirements. The PIU will monitor the effectiveness of the Workers' GRM as part of overall ESMP implementation.

By establishing a dedicated and operational Workers' GRM at site level, the project ensures that labor rights are protected and workplace grievances are addressed effectively, thereby supporting compliance with ESS2 and overall project performance.

7.6.15 Confidentiality and Non-Retaliation

Confidentiality is a cornerstone of the GRM. All grievances will be treated with strict confidentiality, and personal data will be protected. Anonymous submissions will be accepted to ensure that individuals can raise concerns without fear of exposure.

A non-retaliation policy will be strictly enforced. Workers submitting grievances will be protected against any form of intimidation, harassment, or punitive action. This is particularly critical for vulnerable workers and in cases involving sensitive issues such as

7.6.16 Reporting

The PIU maintains a centralized grievance database, tracking resolution timelines and identifying systemic issues. Aggregated performance data is reported quarterly to the World

Bank, ensuring accountability and transparency.

Reports include the number and types of grievances, resolution rates, pending cases, appeals, and GBV-related cases. Summary statistics are disclosed publicly, without personal data, to demonstrate transparency and build trust with stakeholders.

7.6.17 Dissemination

Once finalized, procedures to be followed through the grievance handling system will be translated into local languages (Sindhi and Urdu). These will be made available (in both leaflet and poster format) to all stakeholders, through the PIU office and DC Katchi District.

This reporting system ensures that the GRM is not only a tool for resolving individual grievances but also a mechanism for improving project performance and accountability.

The PIU will ensure that copies of the standard grievance registration form are available with Consultants and the Contractor and are kept in sufficient numbers in local government / and area administration offices including Deputy Commissioners during the entire period of implementation. PIU will also ensure that the database of all grievances submitted is updated on a regular **basis**, and that information on the status of individual cases is made available as required.

7.6.18 The Nomination of Focal Person for GRM at Community Level

The BWSPIP has taken two members nominations form each FO as GRM focal persons at community to further streamline the procedures. These nominations have been taken during community consultations at the focused Jalal Khan scheme. The FOs through mutual agreement of their members, have nominated the following Focal Persons at community level.

Table 7-4: GRM Focal Person at community level

S. No	Name of village	Name of Focal Persons
1	Rehanzai	Abu Bakar S/o Sardar Jalal Khan
2	Rehanzai Kona Jalal Khan	Abdul Nabi Jan s/o Shahmeer Khan

Given that the female community members have restricted mobility outside of their villages and homes, the female PIU staff will be required to undertake visits to the local communities. The female Social Organizer of PSIAC along with the Gender Specialist of PIU will visit the sub-project areas on a weekly, monthly, and quarterly basis to meet with the women folks and can try to solve their grievances at the community level.

7.19 The budget for GRM Implementation

The cost for the implementation of GRM activities of the Jalal Khan Irrigation Scheme (Package 1) is estimated PKR 2,000,000. The cost given will be borne by the project

proponent (Client).

7.7 ENVIRONMENTAL AND SOCIAL MITIGATION AND MONITORING PLAN

The Environmental and Social Mitigation and Monitoring Plan (Table 7-4) is the primary tool for operationalizing the ESMP on site and tracking its implementation over time. It links each identified environmental and social impact with specific mitigation measures, assigns clear implementation responsibilities (Contractor, PDSC, PIU and others), and defines monitoring indicators, methods and frequencies needed to verify compliance and effectiveness.

Table 7-5: Environmental and Social Mitigation and Monitoring Plan

Phase	Impact / Issue	Mitigation Measures (Contractor shall...)	Monitoring Indicators	Frequency	Responsibility (Implementation / Monitoring / Oversight)	ESS / Reference
Construction Phase	**Soil Erosion and Sediment Load (embankments, stockpiles, access roads)**	• Install silt fences, check dams, and sediment traps at all active earthwork fronts before works begin • Construct temporary diversion drains and interceptor channels along embankment slopes to direct runoff away from the river • Stabilize exposed embankment faces by compaction, stone pitching, or mulching within 72 hours of earthworks completion in any section • Maintain a minimum 10 m un-disturbed buffer between active earthworks and any active watercourse or drainage channel • Stockpile spoil and borrow material on level ground away from drainage lines; cover with tarpaulins during rain events • Restore all borrow areas by re-grading, replacing topsoil, and establishing vegetative cover within 30 days of last use • Suspend all earthworks during active flood events; reinstate only after flows recede and bund conditions are verified	• Weekly erosion control inspection checklist (silt fences intact, drains clear, traps functional) – recorded in site diary • Photo documentation before and after major earthworks and after each flood or heavy rain event • Visual inspection of borrow areas monthly; closure condition verified by PDSC Environmental Specialist before backfilling • Number of siltation or bank erosion complaints received through GRM per month (target: zero)	Weekly during active earthworks; after each rain/flood event; at demobilization	**Implementation: Contractor Environmental Officer / Site Engineer** Monitoring: PDSC Environmental Specialist Oversight: PIU Environmental Specialist	ESS1, ESS3, ESS4 Sec. 6.5.1, 6.6.6 BWSPIP ESMF WBG EHS (Construction)
Construction Phase	**Dust and Air Quality (earthworks, vehicle movement, crushing/batching)**	• Water unpaved access roads and all active earthwork areas at least twice daily; increase to three times daily during dry or windy weather (May–June Loo season) • Limit all vehicle speeds to 20 km/h within 500 m of any village • Cover all trucks transporting loose material (sand, gravel, excavated soil) with tarpaulins before leaving the loading point	• PM10 readings at site downwind boundary, monthly minimum; compare against NEQS 24-hr limit of 150 µg/m³; exceedances trigger immediate corrective action • Weekly during peak earthworks phase (May–June): weekly PM10 readings; results in monthly EMRs to PDSC and PIU • Visual observation of water sprinkling compliance by PDSC Site Inspector during each weekly	Monthly minimum; weekly May–June peak earthworks; after each dust storm event	**Implementation: Contractor Environmental Officer** Monitoring: PDSC Environmental Specialist Oversight: PIU Environmental Specialist	ESS1, ESS3, ESS4 Sec. 6.6.1, 6.6.2 NEQS Air Standards WBG EHS Guidelines

		• Locate concrete batching and material crushing plants at minimum 500 m downwind from the nearest settlement • Provide FFP2-minimum dust masks to all workers engaged in earthworks, material handling, and compaction tasks; N95 respirators during extreme dust events • Erect dust-suppression barrier screens at site boundaries adjacent to settlements • Suspend all earthworks during active dust storm events (wind above 25 km/h with visible dust); reinstate only after conditions clear • No outdoor earthworks between 12:00 and 16:00 during May–August (heat and dust peak)	visit; recorded in site checklist • Number of dust or air quality complaints received through GRM per month (target: zero) • Dust mask availability and usage observed during weekly PPE compliance check (target: 100%)			
Construction Phase	**Noise and Vibration (heavy machinery, compaction, concrete works)**	• Restrict all noisy works (excavation, compaction, concrete breaking, pile driving if any) to 08:00–17:00 on weekdays only; no works on Fridays or public holidays • No outdoor heavy machinery works between 12:00 and 16:00 during May–August • Maintain all equipment to manufacturer service schedules; fit exhaust mufflers and acoustic enclosures on generators and compressors • Notify affected communities and FOs at least 48 hours before commencing any high-noise activity (compaction, concrete-breaking, pile works) • Limit vibro-compactor use within 200 m of any structure; use dynamic roller compaction as alternative where feasible • Post noise complaint mechanism (GRM contact) on site entrance notice board and at FO offices	• Noise level at nearest sensitive receptor (Rehanzai New, 1.145 km) measured monthly using calibrated noise meter; compare against NEQS limit of 45 dB(A) for residential/rural daytime • Equipment maintenance log reviewed by PDSC monthly; non-compliant equipment flagged and repaired within 7 days • Number of noise or vibration complaints received through GRM per month (target: zero) • Working hours compliance checked during PDSC daily site inspection log	Monthly ambient noise measurement; daily working hours compliance check	**Implementation: Contractor OHS Officer** Monitoring: PDSC Environmental Specialist Oversight: PIU Environmental Specialist	ESS1, ESS3, ESS4 Sec. 6.6.4 NEQS Noise Standards WHO 2018 Guidelines
Construction Phase	**Occupational Health and Safety (OHS)**	• All workers complete OHS induction training and sign the	• Number of Lost Time Injuries (LTIs) per month (target: zero)	Weekly OHS inspection;	**Implementation: Contractor OHS Officer**	ESS2, ESS4 Sec. 6.6.3

	(all construction activities)	Code of Conduct (CoC) before entering the site; no exceptions • Mandatory PPE at all times on site: hard hat, safety boots, high-visibility vest, gloves, and eye protection; dust masks during earthworks • No outdoor work between 12:00 and 16:00 during May–August; provide shaded rest areas and a minimum of 5 liters potable water per worker per day; electrolyte supplements during peak heat • Station a certified first-aider and fully stocked first-aid kit at each active work front; paramedic on site at all times during works • Conduct OHS toolbox talks weekly for all active work gangs; document attendance • All Lost Time Injuries (LTIs) reported to PIU within 24 hours and to World Bank within 48 hours; fatalities reported immediately • Prepare and maintain Job Safety Analyses (JSAs) for all high-risk tasks: confined space, trenching, work at height, crane lifts • Emergency response equipment (fire extinguisher, spill kit, first-aid stretcher) present at each work front; locations posted on site plan	• PPE compliance rate (%) observed during weekly PDSC site inspection (target: 100%) • Number of heat illness incidents per month (target: zero) • Potable water availability (liters/worker/day) verified by weekly Contractor self-report (target: minimum 5 liters) • Number of OHS toolbox talks held per week vs. required (target: 100% compliance) • OHS inspection checklist completed by Contractor OHS Officer weekly; reviewed by PDSC monthly	monthly OHS compliance report to PIU; incident reporting within 24 hrs	Monitoring: PDSC Environmental and Social Specialist Oversight: PIU Environmental Specialist	Balochistan OSH Act 2022 WBG EHS (OHS) Guidelines
Construction Phase	**Water Quality (fuel/chemical spills, wastewater, sedimentation)**	• Establish bunded fuel and chemical storage with impermeable liner; minimum 110% containment capacity of the largest single vessel • Designate a single vehicle washing and refueling area at least 100 m from any water body or drainage channel; lined and drained to sump • No vehicle maintenance, oil changes, or fuel transfers within 100 m of any water body, drainage channel, or irrigation canal • Install silt fences and check dams	• Surface water quality sampling (fecal coliforms, turbidity, pH, heavy metals Cd and Pb) at upstream and downstream reference points quarterly by SES or equivalent accredited lab; compare against NEQS • Visual inspection of bunded fuel storage weekly by Contractor Environmental Officer; recorded in site diary • Number of spill incidents per month (target: zero); any spill above 5 liters reported to PIU within 24 hours	Quarterly surface water sampling; weekly bund inspection; semi-annual groundwater check	**Implementation: Contractor Environmental Officer** Monitoring: PDSC Environmental Specialist Oversight: PIU Environmental Specialist	ESS1, ESS3, ESS4 Sec. 6.6.7 NEQS Water Standards NDWQS WBG EHS Guidelines

		at all active earthwork fronts before monsoon season starts (before 1 June each year) • Provide all camp workers with treated drinking water; no use of raw surface water or groundwater without treatment and testing • Collect and treat all camp wastewater (grey and black) through septic tank or equivalent system; no direct discharge to ground or watercourse • Spill Response Plan to be in place before works start; respond to any fuel/chemical spill within 30 minutes using on-site spill kit	• Camp wastewater system inspected by Contractor monthly; PDSC to verify quarterly • Groundwater quality monitoring at camp site (one well or shallow piezometer) semi-annually			
Construction Phase	**Solid and Liquid Waste Management (construction debris, hazardous waste, camp waste)**	• Prepare and implement a Waste and Spoil Management Plan as part of the C-ESMP before works start • Segregate all waste at source: construction debris, metal scrap, plastic, organic waste, and hazardous waste (used oil, solvents, batteries) in separate labeled containers • Reuse excavated material as structural fill where technically feasible; dispose of surplus spoil at approved sites only • Used oil, solvents, chemical containers, and batteries to be collected by a licensed waste handler; maintain waste transfer manifests • No open burning of waste on site or in the camp; no waste dumping in drainage channels, riverbeds, or agricultural land • Install adequate sanitation facilities (minimum 1 toilet per 15 workers, separate for male/female) in the camp; maintain hygiene standards • Remove all construction waste from site and dispose properly within 30 days of completing each section of works	• Weekly camp sanitation inspection checklist (waste segregation bins present, latrine condition, waste collection status) by Contractor Environmental Officer • Hazardous waste disposal manifest reviewed by PDSC monthly (target: 100% documented disposal to licensed handlers) • Number of unauthorized waste disposal or dumping incidents per month (target: zero) • Camp toilet-to-worker ratio verified monthly (target: minimum 1:15 with male/female separation)	Weekly camp sanitation check; monthly waste audit by PDSC; manifests reviewed monthly	**Implementation: Contractor Environmental Officer** Monitoring: PDSC Environmental Specialist Oversight: PIU Environmental Specialist	ESS1, ESS3 Sec. 6.6.6 BEPA 2012 WBG EHS (Waste Mgmt)
Construction	**Vegetation and Tree**	• Restrict clearance strictly to the	• Pre-clearance tree count verified	Pre-clearance	**Implementation:**	ESS1, ESS3,

Phase	**Loss (site clearance, RoW works, borrow areas)**	approved RoW footprint; mark boundaries with physical pegs before any machinery enters • Remove only the 1 tree within approved RoW; compensate at a minimum 5:1 ratio (5 tree planted) of equivalent native species in community areas • Uproot and remove stumps (141 total within 1 km area) using mechanical means only; no burning • Store and reuse topsoil from cleared areas for re-vegetation and borrow area restoration; do not mix with subsoil • Prohibit Contractor workers and laborers from collecting fuelwood, hunting, or disturbing wildlife within and beyond the RoW • Restore all temporarily disturbed areas outside the permanent footprint with native plant species within 60 days of works completion in that section	against approved list (1 tree in RoW) before clearance starts; any discrepancy stopped and reported to PIU • Compensatory tree planting record: number planted, species, location, survival rate at 3 months and 12 months (target: 80% survival at 12 months) • Borrow area vegetation restoration progress checked monthly against schedule • Number of unauthorized clearance incidents beyond RoW per month (target: zero)	verification before works; monthly borrow area checks; 3-month and 12-month plantation survival audit	**Contractor Environmental Officer / Site Engineer** Monitoring: PDSC Environmental Specialist Oversight: PIU Environmental Specialist	ESS6 Sec. 6.6.5, 6.6.8 Balochistan Forest Act 2022 Balochistan Wildlife Act 2014
Construction Phase	**Fauna and Biodiversity (site clearance, works near river, camp activities)**	• Conduct a pre-clearance walk-through by the PDSC Environmental Specialist to identify any nesting birds, reptiles, or mammals in the clearance zone; delay clearance if active nests found until fledging is complete • Prohibit all hunting, trapping, fishing, and collection of wildlife by Contractor workers; include zero-tolerance clause in worker CoC • No camp fires outside designated fireproof areas; no fuelwood collection from riparian or natural vegetation • Carry out vegetation clearance outside main bird breeding season (March–June) where construction schedule permits • Restrict generator and machinery noise near the riparian buffer to daytime working hours only	• Pre-clearance biodiversity walk-through report filed with PIU before site clearance starts • CoC compliance for hunting/wildlife disturbance prohibition confirmed during monthly Contractor HR audit • Number of reported wildlife disturbance incidents per month (target: zero) • PDSC to conduct a rapid biodiversity spot check quarterly during construction to verify no unauthorized habitat disturbance	Pre-clearance check before works; monthly HR CoC audit; quarterly spot biodiversity check	**Implementation: Contractor Environmental Officer** Monitoring: PDSC Environmental Specialist Oversight: PIU Environmental Specialist	ESS1, ESS6 Sec. 6.6.8 Balochistan Wildlife Act 2014 IUCN Red List screen

Construction Phase	**Community Health and Safety (traffic, construction hazards, community access)**	• Prepare and submit a Community Health and Safety Plan (CHSP) as part of the C-ESMP before site mobilization • Erect site boundary fencing and safety barriers at all active work fronts before earthworks begin; maintain throughout construction • Post warning signs (in Urdu and pictograph format) at all site access points and road crossing points • Assign traffic flag persons at all points where heavy construction vehicles cross or join community roads • Enforce 20 km/h speed limit for all project vehicles on community roads; lower to 10 km/h when passing through settlements • Maintain all existing community footpaths and access routes throughout construction; provide clearly marked safe alternatives before any route is temporarily closed • Notify communities 72 hours in advance of any planned road closures or access disruptions • Submit a traffic accident response protocol as part of the CHSP; first-aid support for public injured by project vehicles must be provided within 30 minutes	• Number of traffic accidents or incidents involving community members per month (target: zero) • Site fencing and signage compliance observed during PDSC weekly site inspection; recorded in site checklist • Number of community health and safety complaints received through GRM per month (target: zero) • Speed compliance spot check by Contractor CLO weekly on community roads (minimum 3 spot checks per week) • Community access routes inspected by PDSC monthly; any blocked route without approved alternative reported immediately to PIU	Daily fencing/access check; weekly speed compliance spot check; monthly access route inspection; GRM tracking monthly	**Implementation: Contractor CLO / OHS Officer** Monitoring: PDSC Environmental and Social Specialist Oversight: PIU Social Specialist	ESS4 Sec. 6.6.10, 6.6.12 BEPA 2012 WBG EHS (Community H&S)
Construction Phase	**Labor Influx, Camp Management, and GBV/SEA/SH**	• Prepare and submit a standalone SEA/SH Action Plan to the World Bank for approval before contract award • Restrict Contractor workers to camp and designated worksites; no unauthorized movement into villages; enforce through daily roll call and CoC • All workers sign the CoC before site entry and complete SEA/SH awareness training before mobilization; zero exceptions • Zero-tolerance policy for	• Number of CoC signings equals total workers mobilized (target: 100%) • Number of GBV/SEA/SH incidents reported through any channel per month (target: zero incidents; 100% resolution rate if any reported) • Monthly confirmation from Contractor that camp security perimeter, access controls, and worker curfew are functioning • Local hiring percentage verified monthly from payroll records	Monthly HR and GRM audit; monthly camp compliance inspection; SEA/SH incident reporting within 24 hrs	**Implementation: Contractor HR Officer / CLO** Monitoring: PDSC Social Specialist / PIU Gender Specialist Oversight: PIU Social Specialist / World Bank	ESS2, ESS4 Sec. 6.6.11, 6.6.13 BWSPIP LMP SEA/SH Action Plan

		GBV/SEA/SH and drug/alcohol use: immediate dismissal for any confirmed violation • Conduct GBV/SEA/SH awareness sessions for workers monthly; for surrounding communities quarterly (women-only sessions facilitated by female staff) • Locate camp at minimum 500 m from nearest village; restrict non-local workers to camp outside working hours • Hire minimum 75% unskilled labor from the four project villages; coordinate through FOs and maintain a transparent hiring register • Camp to have separate male/female sanitation, medical area, and prayer space; maintain at all times	(target: minimum 75% unskilled from project villages) • Monthly worker GRM activity report (number of complaints received, resolved, pending) submitted to PIU			
Construction Phase	**Labor and Working Conditions (ESS2 compliance, worker rights, supply chain)**	• Pay all workers at or above the Balochistan provincial minimum wage; no unauthorized deductions; wages paid weekly • Provide payslips showing hours worked, rate per hour, deductions, and net pay; maintain records available for PIU inspection • No child labor (under 18 years): verify age through CNIC or birth certificate before hiring; maintain age verification register • No forced labor or debt bondage: no retention of identity documents, no advance payment arrangements that restrict worker freedom • Worker GRM to be operational before mobilization: named focal point, physical complaint box at camp, intake available in Urdu, Balochi, and Sindhi for migrant workers • Conduct primary supply chain screening for aggregate, steel, and cement suppliers before procurement; identify and log high-	• Payroll compliance verified by PIU Social Specialist against payslip samples monthly (target: 100% at or above minimum wage) • Age verification register reviewed by PDSC monthly (target: zero under-18 workers) • Worker GRM focal point confirmed active and accessible monthly by PDSC; intake channels (Urdu/Balochi/Sindhi) verified • Number of labor rights complaints received through Worker GRM per month (target: zero outstanding unresolved complaints beyond 15 days) • Supply chain screening documentation submitted to PIU before procurement starts; spot audit reports filed quarterly	Monthly payroll compliance check; monthly Worker GRM activity review; quarterly supply chain audit	**Implementation: Contractor HR Officer** Monitoring: PDSC Social Specialist Oversight: PIU Social Specialist / World Bank	ESS2 Sec. 7.6.14 BWSPIP LMP Balochistan Factories Act 2021 OSH Act 2022

		risk suppliers • High-risk primary suppliers subject to at least one spot audit per quarter by Contractor HR Officer; findings logged and shared with PIU				
Construction Phase	**Voluntary Land Donation (VLD) (14 parcels, 60.68 acres, pre-construction compliance)**	• Submit complete VLD documentation for all 14 donated parcels to the World Bank before contract award: signed stamp paper agreements, cadastral record extracts, and VLD screening checklists per BWSPIP RPF format • No construction activity on any VLD parcel until World Bank written no-objection is received and confirmed to the Contractor in writing by PIU • PIU Social Specialist to verify each landowner personally confirms: donation is voluntary, donated area is less than 10% of total holding, and no pressure was applied • Maintain a VLD complaints log through the GRM; any landowner concern to be escalated to PIU within 3 working days • Ensure all 14 VLD parcels are restored to original or improved condition within 6 months of construction completion in each area	• VLD documentation completeness verified by PIU before contract award (checklist of all 14 parcels, 100% complete required) • World Bank written no-objection confirmed and filed before mobilization on VLD parcels • Number of VLD landowner complaints received through GRM per month (target: zero) • Post-construction land condition inspection of all 14 parcels by PIU Social Specialist within 6 months of construction completion; report filed with World Bank	Pre-contract verification (once); VLD parcel monitoring monthly during construction; post-construction inspection within 6 months	**Implementation: PIU Social Specialist** Monitoring: PDSC Social Specialist Oversight: PIU / World Bank	ESS5 Sec. 4.2 (VLD) BWSPIP RPF World Bank ESS5 Note on VLD
Construction Phase	**Borrow Area Management (material extraction, site restoration, landowner agreements)**	• Sign a formal written agreement with each borrow area landowner before extraction begins; document landowner's name, area, duration, and restoration commitment • Prioritize barren, non-productive land for borrow areas; avoid agricultural land; get PIU Environmental Specialist written approval for each borrow site • Limit extraction depth to what is technically specified; do not exceed approved lateral	• Landowner agreements for all borrow areas reviewed and filed by PIU before extraction starts (target: 100% formal agreements in place) • Borrow area boundary compliance inspected monthly by Contractor Environmental Officer; any exceedance reported to PIU within 24 hours • Borrow area restoration completion inspected by PDSC Environmental Specialist; sign-off required before final site handover • Number of landowner complaints	Pre-extraction agreement verification; monthly boundary compliance check; post-use restoration inspection	**Implementation: Contractor Environmental Officer / Site Engineer** Monitoring: PDSC Environmental Specialist Oversight: PIU Environmental Specialist	ESS1, ESS5 Sec. 3.3.4 BWSPIP ESMF Borrow Area ECOPs (Annex C)

		boundaries; mark with physical boundary posts • Install erosion control (silt fences, cut-off drains) around all active borrow areas before extraction starts • Restore all borrow areas within 30 days of last use: re-grade to natural slope, replace topsoil, establish native vegetative cover or re-seed • Prohibit use of borrow areas as waste disposal sites or vehicle washing areas	about borrow areas received through GRM (target: zero)			
Construction Phase	**Stakeholder Engagement, Disclosure, and GRM (community communication, grievance management)**	• Prepare a non-technical ESMP summary in Urdu and Balochi; share with affected communities before civil works start through FO-led village meetings • Disclose the ESMP on the PIU website and confirm disclosure date and format in the ESMP; submit ESMP disclosure confirmation to the World Bank • Post GRM information (focal person name, contact, complaint process) in Urdu and Balochi on notice boards at camp entrance and all four village FO offices • Install complaint boxes at FO offices, camp entrance, and site entrance; collect and log weekly • Maintain a Stakeholder Engagement Schedule specifying: community meeting format, frequency (minimum monthly), and responsible party (Contractor CLO + PIU Social Specialist) • Conduct monthly FO briefing meetings during construction; document attendance by gender; share minutes with PIU within 5 days	• ESMP disclosure confirmation (date, format, communities reached) filed with PIU before works start • Number of community GRM complaints received, acknowledged, and resolved monthly; GRM register maintained (target: acknowledgement within 72 hrs, resolution within 15 working days) • Stakeholder Engagement Schedule compliance: number of community meetings held vs. required per month (target: 100%) • Attendance records from monthly FO meetings showing gender breakdown (target: minimum 30% female participation in all consultations)	Pre-works disclosure (once); monthly FO meetings; continuous GRM tracking; quarterly progress report to World Bank	**Implementation: Contractor CLO / PIU Social Specialist** Monitoring: PDSC Social Specialist Oversight: PIU Social Specialist / World Bank	ESS10 Sec. 5.2, 5.4, 7.6 BWSPIP SEP ESCP Disclosure Requirements
Construction Phase	**Cultural Heritage / Chance Finds (archaeological and cultural properties)**	• Brief all construction workers and supervisors on the Chance Find Procedure (Annexure D) before earthworks begin • If any artifact, structure, burial site,	• Chance Find Procedure briefing attendance register reviewed before works start (target: 100% of workers and supervisors briefed) • Number of chance finds	Pre-works briefing (once); ad hoc on chance find occurrence;	**Implementation: Contractor Site Engineer** Monitoring: PDSC Environmental Specialist	ESS8 (Chance Finds) Sec. 7.8.12 Annexure D Balochistan

		or object of potential cultural significance is encountered: stop all works within a 50 m radius immediately • Report the find to the PIU within 4 hours and notify the Department of Archaeology, Balochistan within 24 hours • Secure the find area with temporary barrier tape; no works to resume until the Archaeology Department provides written clearance • Document all finds with photographs, GPS coordinates, and a written description before any protective measures are taken • Three community mosques and three graveyards in the scheme area are located outside the RoW; confirm their boundaries before works start and include on site map	encountered; all finds confirmed to have been stopped and reported per procedure (target: 100% procedural compliance) • PIU site visit to cultural property boundaries (mosques and graveyards) before works start; confirmation filed that all are outside approved work footprint	cultural property boundary check before works start	Oversight: PIU Environmental Specialist	Antiquity Act 2014
Operation Phase	**Flood Protection and Weir Operation (operation and maintenance phase)**	• Conduct Operation and Maintenance (O&M) training for all assigned irrigation department staff before handover; minimum 5 days structured training on gate operation, flood response, and emergency procedures • Inspect all gates, head regulator, under-sluice, and embankment sections before each monsoon season (by 31 May annually) • Maintain an O&M log recording all inspections, repairs, gate operations, and flood events; submit to PIU quarterly • Activate Emergency Response Plan for flood events exceeding design flows; notify District Administration, DDMA, and communities through FOs at least 24 hours in advance where forecasting allows • No unauthorized structures, encroachments, or cultivation within 10 m of the embankment	• Annual pre-monsoon structural inspection report submitted to PIU by 31 May each year; any identified defects with remedial timeline • Number of O&M events (gate operations, flood responses) logged per quarter • Number of encroachment incidents on RoW per year (target: zero) • Beneficiary community satisfaction survey conducted annually through FOs (target: minimum 70% satisfied with water delivery)	Annual pre-monsoon structural inspection; quarterly O&M log review; annual beneficiary survey	**Implementation: Irrigation Department O&M Staff** Monitoring: PIU Environmental and Social Specialist Oversight: BWSPIP PIU / World Bank (during Implementation Support Missions)	ESS1, ESS4 Sec. 8 (Conclusions) O&M Manual (to be prepared)

		crest or RoW; enforce through quarterly joint inspection with district administration				
Operation Phase	**Water Distribution and Tail-End Supply (equitable water access, FO management)**	• FOs must maintain an active water distribution schedule verified against design discharge at head and tail-end points • PIU Social Specialist to conduct semi-annual water distribution equity checks: field measurement of flow at main head regulator vs. tail-end distributaries • FOs to log all water distribution disputes and resolve through the project GRM within 15 days • Conduct annual FO performance review; provide refresher training to FO members if distribution equity falls below agreed standard	• Tail-end water delivery confirmed at or above 70% of design discharge in at least 80% of measured events per irrigation season • Number of water distribution disputes logged through GRM per season (target: all resolved within 15 days) • FO meeting attendance and distribution schedule compliance recorded semi-annually	Semi-annual field measurement; annual FO performance review; continuous GRM tracking	**Implementation: Irrigation Dept. / FOs** Monitoring: PIU Social Specialist Oversight: BWSPIP PIU	ESS1, ESS10 Sec. 5.3, 5.4 BWSPIP PDO Indicators

7.7.1 Reporting and Non-Compliance with ESMP

The Construction Contractor (CC) will prepare and submit regular environmental and social compliance reports to the Project Design and Supervision Consultant (PDSC). These reports will be reviewed and endorsed by the Environmental Specialist (ES), Resident Engineer (RE) and Chief Resident Engineer (CRE), and then forwarded as Environmental Performance Reports to the Implementing Agency (Irrigation Department Balochistan) on a monthly, quarterly and semi-annual basis for onward submission to the World Bank for due diligence and public disclosure.

ESMP implementation requires coordinated inputs from the CC, PDSC and Irrigation Department. The CC is primarily responsible for implementing all mitigation measures specified in the ESMP, which are embedded in the contract documents and reflected as a separate ESMP cost item in the Bills of Quantities. If the CC fails to comply with ESMP requirements or reporting obligations, the Implementing Agency will enforce corrective actions under the terms of the contract, including measures necessary to restore compliance with the ESMP and World Bank operational policies.

In addition, grievance data and community feedback captured through the project GRM (Section 7.6) will be integrated into ESMP reporting, providing an important source of information for identifying non-compliance and tracking corrective actions.

7.7.2 Environmental Management Budget for Contractor

The ESMP budget is an integral part of the overall project cost and ensures that key environmental and social risks are adequately resourced and managed. All ESMP-related activities will be carried out by the Contractor under the day-to-day supervision of the PDSC, and the associated costs will be priced in the Contractor's bid in line with the Conditions of Contract. The ESMP implementation budget presented in Table 7-3 (ESMP Implementation Cost Estimates) is specific to this sub-project and will be used by the Contractor to prepare and implement the C-ESMP, OHS Plan, baseline monitoring, provision of PPE and other ESMP measures. Environmental and social management costs for this subproject shall be embedded within the contractor's BOQ, site establishment, staffing, monitoring, training, PPE, waste management, camp management, traffic safety, community engagement, and contingency provisions. The Contractor shall not treat ESMP implementation as an optional or provisional activity.

Component 6 of Table 7-3, which covers community and gender awareness sessions on environmental health and safety, GBV and SEA, will be delivered by the Gender and Social Safeguard Specialist in coordination with the PIU and PDSC, based on project needs and the level of risk in each location.

Table 7-6: Revised ESMP Implementation Cost Estimates (Illustrative)

S. No.	Description	Rationale (short)	Estimated Cost (PKR)
1	Preparation and implementation of Contractor ESMP (C-ESMP), including Pollution Prevention Plans (air/noise/waste/sanitary), Traffic Management Plan, EHS Training Plan, CHS Plan	Lump-sum for preparation, periodic updating, printing, internal audits	800,000
2	Preparation and implementation of Contractor Health and Safety Plan (detailed HSP and emergency response plan)	Detailed OHS procedures, drills, mock exercises, signage	300,000
3	ESMP staffing for project duration (24 months assumed): Environmental Officer, Health and Safety Officer / Paramedic; Community Liaison Officer / Gender Mobilizer	Two full-time staff @ ~100,000/month each for 12 months of active works (or adjust to your real schedule) Accredited lab services, mobilization, reporting	3,600,000
4	Baseline and periodic ambient air, water and noise monitoring (quarterly at key locations)		800,000
5	PPE and HSE equipment (helmets, boots, vests, masks/respirators, harnesses, fire extinguishers, first-aid, signage)	Initial procurement plus replenishment over contract period	500,000
6	Community and worker awareness sessions on environmental health and safety, communicable diseases, GBV/SEA/SH (at least quarterly; separate women's sessions)	Venue, IEC materials, facilitation by Gender & Social Specialist	250,000
7	GRM implementation and community liaison (GRM materials, registers, travel for CLO and PCC outreach, hotline/SIM costs)	Needed to operationalize Section 7.6 GRM in practice	200,000
8	Training and capacity building for PIU/PDSC/contractor staff on ESF/ESMP, LMP, OHS/CHS (beyond toolbox talks)	2–3 formal trainings plus refreshers	250,000
9	Contingency for additional ESMP measures (e.g. extra monitoring, design of corrective actions, unanticipated issues) – about 10%	Keeps budget realistic and flexible	550,000
10	Compensatory Tree plantation (including pit alignment, pit excavation, pit enrichment, plant fencing, transportation, loading and unloading, planting a tree and after care for two year as per approval of the Project Manager	141 trees / plants of indigenous species of required height as per approval of the Project Manager (PKR 2500 per plant)	1,762,500
	Total Estimated ESMP Implementation Cost		**9,012,500**

A detailed cost working tables supporting these estimates is attached as Annexure-O, providing a breakdown of all ESMP cost components. The estimates cover breakdown PPE requirements, E&S staffing, training and capacity building, environmental monitoring, GRM operations, and a contingency allocation calculated at 10% of the total budget.

This baseline cost sheet and its associated tables will also be used to estimate ESMP implementation budgets for all subsequent subproject ESMPs under BWSPIP, ensuring consistency across the project.

7.8 DEVELOPMENT OF OTHER E&S PLANS AND INSTRUMENTS

Before mobilization and the start of any rehabilitation works, the Construction Contractor (CC) will prepare a comprehensive Contractor's Environmental and Social Management Plan (C-ESMP). The C-ESMP will be reviewed and approved by the Project Design and Supervision Consultant (PDSC) and PIU to ensure full alignment with the project ESMF, this site-specific ESMP and the World Bank Environmental and Social Standards (ESSs). No civil works shall commence until the Contractor has prepared the required site-specific management plans, the PDSC has completed technical review, and the PIU has issued written approval or clearance, as Relevant under the contract.

The C-ESMP will be the CC's principal document for managing environmental, social, health and safety aspects during construction, translating ESMP requirements into detailed site-specific procedures and method statements for the Contractor and all subcontractors. It will include, but not be limited to, the following sub-plans and instruments:

- Occupational Health and Safety (OHS) Plan
- Waste and Spoil Management Plan
- Material Transportation Plan
- Emergency Response Management Plan
- Traffic Management Plan
- Gender-inclusive / GBV-SEA-SH Action measures
- Community Health and Safety Plan
- Labor Management Plan (applying the approved project LMP)
- Camp Management Plan
- Chance-Find Procedure for cultural heritage
- Grievance Redress Mechanism for workers and communities

Each sub-plan will clearly define implementation responsibilities, monitoring arrangements and reporting requirements to ensure effective E&S risk management throughout the construction period.

7.8.1 Occupational Health and Safety Plan (OHS Plan)

The Construction Contractor (CC) shall prepare and implement a site-specific Occupational Health and Safety Plan (OHS Plan) as part of the Contractor's ESMP (C-ESMP). The OHS Plan shall be submitted to the PIU and PDSC for review and written approval before mobilization and before any construction activities commence, and shall be updated whenever there is a major change in scope, construction methodology, or following any significant OHS incident.

The OHS Plan shall be fully consistent with ESS2, relevant national labor and OHS legislation, the World Bank Group Environmental, Health and Safety (EHS) Guidelines, and the workers' accommodation standards reflected in the Workers' Accommodation Guidance Note (IFC/EBRD). At a minimum, the OHS Plan shall include the following components:

- OHS management system and responsibilities: organizational chart showing the dedicated OHS Officer and reporting lines; roles and responsibilities of the Contractor's staff, subcontractors and workers in implementing OHS measures.
- Hazard identification and risk assessment: systematic identification of task-specific hazards for all key construction activities (earthworks, excavation, work near water, work at height, lifting operations, traffic management, handling of fuels and chemicals, camp operations), with assessed risk levels.
- Control and preventive measures: detailed control measures for each significant hazard, including engineering controls, administrative controls, safe-work procedures and PPE requirements, aligned with the mitigation measures in Section 6.6.3 and Table 7-2.
- Job Safety Analyses (JSAs): procedures and templates for preparing JSAs for high-risk activities, including requirements for supervisor and worker sign-off before work starts and periodic review when site conditions change.
- PPE program: PPE specifications for different tasks, arrangements for provision, replacement, storage and enforcement, and procedures for regular PPE inspections.
- Training, induction and toolbox talks: program and schedule for OHS induction of all workers and visitors, regular toolbox talks and specialized trainings (e.g. working at height, lifting operations, first aid, heat-stress management).
- Emergency preparedness and response: site-specific emergency response procedures for accidents, fires, spills, floods and other emergencies; contact details of nearest health facilities; evacuation routes and assembly points; requirements for drills and coordination with local authorities.
- First-aid and medical services: provisions for first-aid kits, trained first-aiders, on-site medical support where Relevant, and transport arrangements to the nearest health facilities.
- Worker accommodation and welfare: OHS-related requirements for camps and accommodation, including space, sanitation, drinking water, hygiene, fire safety, vector control and security, in line with Section 3.3.3 and the Workers' Accommodation

Guidance Note.

- Incident reporting and investigation: procedures and formats for recording, reporting and investigating all accidents, incidents and near-misses; corrective and preventive-action planning; and reporting timelines to the PDSC, PIU and the World Bank where required.
- Monitoring, inspection and audit: routines for daily and weekly safety inspections, internal OHS audits and performance indicators (e.g. incident rates, training coverage, PPE compliance), aligned with the monitoring indicators in Table 7-2.
- Worker participation and grievance mechanism: arrangements to consult workers on OHS matters and link the OHS system with the worker grievance mechanism described in the GRM section.

The approved OHS Plan will be a living document, reviewed at least annually and after any serious incident to incorporate lessons learned and continuous-improvement measures. Implementation of the OHS Plan will be monitored using the indicators and responsibilities specified in the Environmental and Social Mitigation and Monitoring Plan (Table 7-2), and findings will be reported through the ESMP reporting framework described in Section 7.7.1.

7.8.2 Waste and Spoil Management Plan

The Waste and Spoil Management Plan (WSMP) will provide a comprehensive framework for the proper collection, handling, storage, transport and disposal of all waste and spoil materials generated during the construction phase. It will specify the key elements to be incorporated into the waste-management procedures and operational guidelines to be prepared and implemented by the CC.

A licensed waste-management contractor will be engaged to ensure that waste is collected regularly and disposed of at officially designated sites approved by the relevant Tehsil Municipal Authority (TMA). The WSMP will emphasize best practices to minimize waste generation at source through reuse, recycling and resource-efficient construction methods. Both solid and liquid wastes from construction activities and workers' camps will be managed in accordance with Relevant environmental standards and regulatory requirements, and excess spoil generated by excavation and earthworks will be handled, transported and disposed of in line with WSMP measures to prevent erosion, dust and other adverse impacts. Monitoring and reporting of waste-management performance will follow the indicators in Table 7-2 and the reporting arrangements in Section 7.7.1.

7.8.3 Material Transportation Plan

A Material Transportation Plan (MTP) will be prepared by the CC to ensure safe, efficient and environmentally responsible movement of construction materials to and from work sites. The MTP will identify risks associated with transport activities and define measures to prevent accidents, spills and damage to property or the environment, taking account of local road conditions, plain and hilly sections and sensitive receptors. It will address road safety, vehicle

maintenance, load management, routing and driver training, and will require strict adherence to traffic-safety and security protocols to minimize risks to workers, communities and project assets. Compliance with the MTP will be tracked through the traffic- and CHS-related indicators in Table 7-2.

7.8.4 Emergency Response Management Plan

The Emergency Response Management Plan (ERMP) will be prepared by the CC to address potential risks, hazards and emergency situations during construction. The ERMP will define prevention, preparedness and response procedures for emergencies such as accidents, fires, floods, spills, structural failures and extreme weather, and will include clear roles, communication lines, contact details and coordination arrangements with local authorities and emergency services. The ERMP will be reviewed and approved by the PIU/PDSC prior to implementation, and all site personnel will be trained and drilled in its procedures. Key ERMP actions and drills will be reflected in the monitoring plan (Table 7-2) and reported under Section 7.7.1.

7.8.5 Traffic Management Plan

A Traffic Management Plan (TMP) will be developed by the CC to manage the safe movement of vehicles, equipment and personnel during construction. The TMP will identify main haul routes and access roads, consider local traffic patterns and sensitive receptors (schools, markets, mosques, health facilities) and specify control measures such as speed limits, warning signs, flag-persons, detours and designated crossing points. Coordination mechanisms with local traffic authorities and the TMA will be established to maintain public access and manage temporary disruptions. TMP implementation will be monitored through traffic- and CHS-related indicators in Table 7-2 and linked to GRM feedback on traffic issues, as reported in Section 7.7.1.

7.8.6 Community Health and Safety Plan

A Community Health and Safety Plan (CHSP) will be developed by the CC to safeguard the health, safety and well-being of communities around the project area. The CHSP will identify risks from construction activities (traffic, heavy machinery, noise, dust, restricted access, hazardous materials) and set out prevention and mitigation measures such as fencing and barriers, signage, controlled work hours, access management and structured community liaison. The CHSP will include emergency procedures, coordination with local health and safety authorities, awareness campaigns and clear linkages to the project GRM so community concerns can be raised and addressed. Implementation of the CHSP will be monitored by the PDSC and PIU using the social and CHS indicators in Table 7-2 and reported as part of the ESMP reporting cycle.

7.8.7 Labor Management Plan

The approved BWSPIP Labor Management Procedures (LMP), aligned with ESS2 and national/provincial labor law, will apply fully to this sub-project; a separate LMP will therefore

not be prepared. The CC will implement the LMP provisions through the C-ESMP and associated plans (OHS, Camp Management, CHSP, Worker GRM) and will ensure that subcontractors and primary suppliers comply with these requirements. The practical measures on conditions of employment, prohibition of child and forced labor, OHS, non-discrimination, worker accommodation and worker GRM will be monitored through relevant indicators in Table 7-2 and LMP reporting requirements.

7.8.8 Camp Management Plan

The CC will prepare and implement a Camp Management Plan (CMP) for all worker accommodation and associated facilities, consistent with ESS2, ESS4, national regulations and the Workers' Accommodation Guidance Note. The CMP will cover camp siting and layout, accommodation standards, water supply and sanitation, waste management, health services, security, GBV/SEA/SH prevention, camp rules and grievance mechanisms, fire safety and emergency preparedness, and monitoring and inspection arrangements and camp closure/restoration. Camp-related performance will be tracked using indicators on accommodation, sanitation, waste and worker GRM in Table 7-2.

7.8.9 Contractor's Organizational Framework

The Contractor shall provide details of his organizational framework, including the designation of a senior manager with overall responsibility for environmental, social and OHS compliance and implementation of this ESMP and the C-ESMP. The Contractor shall nominate qualified ESHS personnel in accordance with the contract requirements and submit their CVs for review before mobilization to PDSC for approval for the staff to be appointed to the following key positions, demonstrating a minimum of 3–5 years of relevant experience in EHS compliance and reporting on foreign-funded projects and meeting the qualification requirements of the contract and this ESMP:

- Environmental Officer
- Paramedic staff
- Occupational Health and Safety Officer
- Community Liaison Officer/ Safety Supervisor

These positions, their roles and reporting lines shall be reflected in the C-ESMP and in the responsibility's column of the mitigation and monitoring matrix (Table 7-2).

7.8.10 Layout Plans of Contractor Camps

The Contractor shall submit layout plans for the main construction camp and any sub-camps as part of the C-ESMP. Prior to the construction of any camp, the Contractor shall submit the relevant camp layout plan to the PDSC for review and written approval. All layout plans shall include, at a minimum, the following details:

- Location of landfills

- Generators
- Batching plants (if Relevant)
- Storage areas (including hazardous-material storage areas)
- Fuel tanks
- First-aid facilities
- Waste-management facilities
- Medical facilities
- Refueling points
- Plant wash-down points
- Water-supply facilities
- Plant and vehicle parking
- Drainage systems
- Camp location and access roads
- Camp boundary
- Work areas
- Accommodation areas
- Kitchens and dining areas
- Sanitary facilities (including toilets and washrooms/showers)
- Location of sanitary-treatment facilities and discharge points

Camp-layout requirements shall be consistent with the Camp Management Plan (Section 7.8.8) and the siting and design-related mitigation measures specified in Table 7-2.

7.8.11 Review and Approval Process

The PIU, with technical support from the PDSC, shall review the Contractor's C-ESMP and all associated sub-plans before commencement of works. No civil works shall start until the PIU has issued written clearance of the final C-ESMP and required sub-plans and undertake the following steps to ensure effective review and approval of the Contractor's Environmental and Social Management Plan (C-ESMP) and all associated sub-plans:

1. Conduct a comprehensive review of the submitted C-ESMP to assess its completeness, consistency with this ESMP, and compliance with Relevant environmental and social standards.
2. Provide written feedback highlighting any gaps, inconsistencies or required improvements, and request revisions from the Contractor as necessary.
3. Issue formal approval of the revised C-ESMP and sub-plans prior to commencement of any construction activities, confirming that all conditions have been satisfactorily addressed.
4. Oversee and monitor implementation of the approved C-ESMP throughout the construction phase, verifying adherence to the mitigation and monitoring measures and reporting protocols specified in Table 7-2 and Section 7.7.1.

7.8.12 Chance Find Procedure (for cultural heritage)

A Chance Find Procedure (CFP) will be established by the Construction Contractor (CC) to ensure the protection and proper management of any cultural heritage, archaeological artifacts, or historical remains unexpectedly discovered during construction activities. In the event of a chance find, the Contractor shall immediately stop work in the affected area, secure the site, notify the PDSC and PIU without delay, and inform the relevant cultural heritage authority before any work resumes. The procedure will provide clear guidance for the immediate suspension of work at the find location and the prompt notification of the Project Design and Supervision Consultant (PDSC), Implementing Agency, and the relevant authorities such as the Department of Archaeology and Museums. The site will be secured to prevent damage, theft, or unauthorized access until qualified experts assess the significance of the find and determine the appropriate course of action. Construction activities will only resume after obtaining official clearance from the competent authority. The CFP will form an integral part of the C-ESMP and will be communicated to all workers through training and awareness programs to ensure that cultural heritage resources are preserved and managed in accordance with national regulations and the World Bank's Environmental and Social Standard (ESS-8) on Cultural Heritage.

8

CONCLUSIONS

8. CONCLUSIONS

The **Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin (FD/W)** sub-project, situated in the Nari River Basin, District Kachi, Balochistan, is a priority climate-resilience investment under the **Balochistan Water Security and Productivity Improvement Project (BWSPIP)**, designed to protect vulnerable farming communities from catastrophic flash floods, sustain spate-irrigated agricultural livelihoods, and strengthen long-term community resilience across the Kachhi Plain. The sub-project addresses one of Pakistan's most physically challenging and hazard-prone construction environments, a hyper-arid BWh continental desert (Section 4.2.1) with summer temperatures regularly exceeding 48°C, annual precipitation of only 80–100 mm, destructive pre-monsoon Loo wind-driven dust storms, episodic flash floods exceeding 5,000 m^3/s from the Nari–Talli–Bolan river system, high seismic hazard (Seismic Zone 3, BCP 2021; Section 4.2.5), and fine-grained Haplic Yermosol alluvial soils with low permeability and pronounced plasticity (Section 4.2.3). These site-specific physical conditions are not incidental, they have directly shaped the design of every mitigation measure, contractor obligation, and monitoring requirement embedded in this ESMP.

With the ESMP, C-ESMP, and associated thematic sub-plans defined in Chapter 7, fully integrated into project design, contracting, and supervision, the Jalal Khan FD/W sub-project is considered **environmentally and socially implementable**, provided that all prescribed mitigation and monitoring measures are effectively, consistently, and verifiably applied throughout the construction period and beyond.

Regulatory and Policy Compliance

This ESMP has been developed in full compliance with Pakistan's national environmental and social regulatory framework, including the Balochistan Environmental Protection Act 2012, National Environmental Quality Standards (NEQS) and with the World Bank Environmental and Social Framework (ESF), encompassing ESS1 through ESS10, the WBG General EHS Guidelines (April 2007), and the BWSPIP Environmental and Social Management Framework (ESMF). It provides a comprehensive, practical, and enforceable framework for identifying potential environmental and social impacts, defining site-specific mitigation measures, assigning clear implementation responsibilities, and establishing monitoring mechanisms to ensure that adverse effects are minimized and positive outcomes are maximized.

Environmental Baseline and Key Findings

The ESMP is grounded in a robust, independently verified **e**nvironmental baseline established through 24-hour field monitoring conducted on 23 January 2026 at Killi Jalal Khan, Bag Nari, District Kachi, by Sustainable Environmental Services (SES), Karachi (Lab Report No. SESENVJAN2631053995, dated 27 January 2026; detailed results **(Annexure H)**. Key baseline findings that directly define the environmental protection obligations of this ESMP include:

- **Ambient Air Quality (Section 4.2.7):** All eight monitored parameters are within NEQS limits. However, baseline **$PM_{2.5}$ at 24.23 µg/m³ already exceeds the WHO Air Quality Guideline of 15 µg/m³** under natural pre-project conditions, driven by hyper-arid soils and Loo winds, establishing a heightened and mandatory dust management obligation during construction, particularly during the pre-monsoon season (May–June) when PM loading will intensify significantly above this already-elevated baseline
- **Noise (Section 4.2.8):** The 24-hour average baseline noise level of **55.58 dB(A)** is within all NEQS limits; however, marginal WHO guideline exceedances at certain daytime (01:00 PM — 65.7 dB(A)) and night-time (10:00 PM — 58.2 dB(A)) readings under wholly natural conditions confirm the acoustic sensitivity of this rural environment and the imperative for strict construction-phase noise controls, particularly for night-time operations
- **Surface Water Quality (Section 4.2.9):** All physicochemical and heavy metal parameters are within Relevant limits and surface water is suitable for irrigation purposes. However, **Total Coliform (204 count/100ml), E.Coli (144 count/100ml), and Fecal Coliform (70 count/100ml) are all Out of Limit (OL)** against the zero-tolerance NEQS, WHO, and microbiological standards, confirming that surface water must not be used by workers for drinking or cooking without full certified treatment comprising sedimentation, filtration, and disinfection
- **Groundwater Quality (Section 4.2.9): Cadmium at 0.7 mg/L (OL; all-standards limit 0.1 mg/L)** and **Lead at 0.9 mg/L (OL; all-standards limit 0.5 mg/L)** confirm that groundwater at the site is unsuitable for any domestic use without treatment. Combined with brackish TDS (1,921 mg/L) and elevated chlorides (515 mg/L), these exceedances establish a non-negotiable prohibition on untreated groundwater use for workers throughout the entire construction period

These baseline findings are not merely descriptive, they define the **minimum non-negotiable environmental protection standards** that the Contractor must meet and surpass at all times.

Impacts, Mitigation, and Management Instruments

While construction and rehabilitation activities will generate temporary impacts, including soil disturbance, fugitive dust, noise and vibration, waste generation, traffic disruption, surface and groundwater pollution risks, vegetation clearance, fauna disturbance, and community health and safety hazards, these impacts are site-specific, predictable, and effectively manageable through systematic implementation of this ESMP and its associated sub-plans. All impact themes have been comprehensively addressed in Chapter 6, including **waste management**, newly incorporated in Section 6.6.8 in response to World Bank review

comments, covering the full spectrum of inert, domestic, hazardous, medical, and legacy waste streams generated during construction.

The ESMP integrates a suite of mandatory management instruments that the **Contractor** shall prepare and submit for **PDSC and PIU written approval** prior to mobilization, including:

- **Contractor's ESMP (C-ESMP)** with full site-specific environmental and social management provisions
- **OHS Plan** incorporating a Heat Stress Prevention Protocol (mandatory work cessation 12:00–16:00 during May–August; minimum 5 L potable water/worker/day; FFP2 dust respirators mandatory during earthworks)
- **Flash Flood Emergency Response Plan (ERP)** linked to Pakistan Meteorological Department (PMD) early warning alerts with defined stop-work triggers, evacuation routes, and assembly points
- **Dust Management Plan** with water sprinkling schedules, speed limits, and Loo-season earthworks suspension protocols
- **Site Waste Management Plan (SWMP)** applying the full waste hierarchy — Reduce → Reuse → Recycle → Recover → Dispose — with a designated Waste Management Officer and monthly Waste Register reporting
- **Camp Management Plan** consistent with the **IFC/EBRD Workers' Accommodation: Processes and Standards Guidance Note** and Section 3.3.2 of this ESMP; camp sited minimum **500 m** from all sensitive receptors on voluntarily leased land with documented written arrangements
- **Traffic Management Plan** with designated haul routes, speed limits, and community safety protocols
- **Community Health and Safety (CHS) Plan** including GBV/SEA/SH prevention, Code of Conduct, and confidential survivor-centered referral pathways
- **Chance-Find Procedure** for any archaeological, cultural heritage, or legacy hazardous material discoveries

Local Labor and Social Commitments

The Contractor shall **maximize employment of unskilled labor from Jalal Khan and nearby villages** and shall also utilize locally available skilled labor wherever feasible, consistent with the **BWSPIP Labor Management Procedures (LMP)**. Workers shall under no circumstances consume untreated groundwater or surface water from the project area given the confirmed OL exceedances documented in Section 4.2.9 and SES Lab Report SESENVJAN2631053995-C&D.

Institutional Responsibilities

Institutional roles and responsibilities are clearly defined and enforceable. The **Contractor** bears primary responsibility for implementing all mitigation and monitoring measures on the ground and for preparing and implementing all C-ESMP sub-plans. The **PDSC** is responsible for day-to-day supervision of environmental and social compliance, verification of C-ESMP implementation, approval of contractor plans, and submission of periodic compliance reports to the PIU. The **PIU** provides overall project oversight, ensures ESMP integration into contract conditions, and maintains communication with the World Bank. A dedicated **Community Liaison Officer (CLO)** manages ongoing community communication and coordinates the dual-track **Grievance Redress Mechanism (GRM)** covering both worker and community grievances with defined response timeframes.

Monitoring and Adaptive Management

Environmental and social performance will be continuously tracked through the **integrated Environmental and Social Monitoring Plan (Table 7-2)**, with monthly Environmental Monitoring Reports (EMRs) submitted by the Contractor to the PDSC and PIU covering all impact themes, including ambient air quality (monthly; weekly during peak earthworks and May–June Loo season), noise levels, surface and groundwater quality, waste management compliance, OHS incident rates, and community complaint resolution. Periodic independent monitoring shall be conducted by the PIU and BWSPIP. The ESMP is a **dynamic and evolving framework** subject to periodic review throughout the project lifecycle; any newly identified risks, emerging issues, or changes in site conditions will be systematically assessed and reflected in updates to the ESMP, C-ESMP, and associated sub-plans to maintain ongoing compliance and effectiveness.

Overall Assessment and Expected Outcomes

The Jalal Khan FD/W sub-project is expected to generate **significant, lasting, and transformative environmental and socio-economic benefits**, enhanced flood protection for communities and agricultural land across the Kachhi Plain, sustained continuity of spate irrigation for farming households dependent on the Nari–Talli–Bolan river system, restored and secured agricultural livelihoods, and strengthened long-term climate resilience consistent with the water security and disaster risk reduction objectives of the Government of Balochistan and BWSPIP. With diligent implementation of the ESMP supported by continuous monitoring, adaptive management, and meaningful stakeholder engagement, the sub-project is fully expected to achieve its development objectives while maintaining environmental integrity, occupational safety, and social harmony, in an environmentally sustainable, occupationally safe, and socially inclusive manner. The ESMP assigns clear responsibilities to the Contractor, PDSC, and PIU for implementation, supervision, verification, and corrective action. Effective implementation of the ESMP and approved C-ESMP will be essential to manage temporary construction-related impacts and to support environmentally and socially responsible delivery of the Jalal Khan subproject.

9

REFERENCES AND ANNEXURES

9. REFERENCES AND ANNEXURES

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

1. Environment and social framework (ESMF)
2. Environmental and Social Commitment Plan (ESCP)
3. Project Appraisal Document – BWSPIP
4. BWSPIP Labor Management Procedures (LMP)
5. BWSPIP Stakeholder Engagement Plan (SEP)
6. World Bank Group General Environmental, Health and Safety Guidelines, April 2007.
7. Bidding Documents (Jalal Khan Flood Dispersal/Weir and Allied Structure Works).
8. Engineering Drawings (Jalal Khan Flood Dispersal/Weir and Allied Structure).
9. The Balochistan Environmental Protection Act, 2012.
10. The Pakistan Environmental Protection Act, 1997.
11. The Balochistan Wildlife Protection, Preservation, Conservation and Management Act, 2014.
12. The International Union for Conservation of Nature (IUCN) Red List of Threatened Species.
13. Guidelines for Public Consultation, Pakistan Environmental Protection Agency (Pak-EPA).
14. National Disaster Management Plan (NDMP), Government of Pakistan, 2012.
15. Balochistan Integrated water Resources and Development Project – BIWRM

ANNEXURE-A

TRAINING PLAN

The CC will organize regular skill-development and awareness sessions to maintain staff and workers. Training shall include induction training before mobilization, periodic refresher sessions, and task-specific toolbox talks covering environmental management, OHS, PPE, emergency response, waste handling, camp management, community conduct, GBV/SEA-SH prevention, grievance procedures, and chance-find requirements. At least one week of job-specific skill-development training will be provided during mobilization, with refresher trainings and toolbox talks conducted throughout construction.

Key training areas will include but not limit to:

- **Communication skills:** Effective communication with supervisors, co-workers and community representatives to ensure that instructions, safety information and changes in work plans are clearly understood and implemented.
- **Teamwork skills:** Working cooperatively in crews so that tasks are coordinated, conflicts are minimized and productivity and safety are improved.
- **Time-management skills:** Planning and sequencing work to meet deadlines, manage time-sensitive activities (e.g. concrete works) and reduce delays on site.
- **Technical skills:** Practical competencies in manual and mechanical excavation, stone masonry, concrete works, formwork, installation of project structures and safe use of tools and equipment.

Strengthening the capacity of project staff and workers is essential for effective implementation of the ESMF and ESMP and for sustained compliance with E&S mitigation measures. This will be achieved through a series of customized trainings and awareness sessions, as summarized in the training and capacity-building framework in Table 7-4.

Training and Capacity-Building Framework for the Sub-Project

Sr. No.	Key Areas	Key Aspects to Cover	Potential Participants	Frequency of Training	Responsibility
1	E&S Orientation / Awareness	E&S awareness; World Bank Environmental and Social Standards (ESSs); OHS and CHS aspects; Relevant national/provincial E&S legal requirements; ESMF findings; ESMP and its	BWSPIP project staff, including Implementing Partners	At project start; refreshers on a bi-annual basis or as required.	Environmental, Social and Gender Specialists, BWSPIP

Sr. No.	Key Areas	Key Aspects to Cover	Potential Participants	Frequency of Training	Responsibility
		components; GBV and GRM; reporting of incidents/accidents; emergency preparedness and response; Labor Management Procedures; resettlement and land acquisition provisions.			
2	GBV / SEA / SH	Prevention of GBV/SEA/SH; workers' Code of Conduct; survivor-centered response; use of GRM for GBV/SEA/SH complaints; confidentiality and referral pathways.	BWSPIP project staff, including Implementing Partners	At project start; refreshers on a bi-annual basis or when required.	Social and Gender Specialists, BWSPIP
3	ESMF / ESMP Implementation	ESMF components; key steps for ESMP implementation; use of screening and field checklists; GRM and GBV linkages; ESMP/C-ESMP implementation roles; documentation and reporting requirements.	BWSPIP project staff, including Implementing Partners	At project start; refreshers on a bi-annual basis or as required.	Environmental, Social and Gender Specialists, BWSPIP
4	E&S Management and Community Outreach	E&S mitigation plans; stakeholder mapping and engagement; OHS and CHS aspects; sensitization of women beneficiaries on cash-grant support and construction of multi-hazard-resilient houses; awareness on GRM and disaster	BWSPIP project staff; Implementing Partner staff; masons' and community groups; women beneficiaries	At project start; then on-going / informal sessions and refresher trainings during implementation.	Environmental, Social and Gender Specialists, BWSPIP; Gender FPs (Implementing Partners)

Sr. No.	Key Areas	Key Aspects to Cover	Potential Participants	Frequency of Training	Responsibility
		preparedness; emergency prevention, preparedness and response planning; resource efficiency and pollution prevention and management.			

The major construction activities that will be undertaken as part of the sub-project, and which are the focus of the training and capacity-building program, are summarized in Table 7-5.

Table: Construction Activities

Sr. No.	Construction Activity
(i)	Masonry
(ii)	Electrical works
(iii)	Framing
(iv)	Concrete works
(v)	Excavation
(vi)	Environmental codes and practices
(vii)	OSHA safety requirements
(viii)	Reading and interpreting drawings
(ix)	Erecting / structural assembly
(x)	Crane and rigging operations
(xi)	Operation of construction equipment
(xii)	Use of power tools

ANNEXURE-B

Environmental and Social Monitoring Checklist

This checklist is for use by the Contractor's Environmental Officer (primary responsibility), with review and verification by the PDSC Environmental and Social Specialist. Complete this checklist every two weeks during active construction and monthly during low-activity periods. Submit completed checklists to the PIU with the monthly ESHS report. Means of verification include direct observation, review of Contractor records (PPE distribution logs, training attendance sheets, waste disposal records), community feedback through the GRM, and photographic documentation.

Project Name:	BWSPIP – Jalal Khan FD/W Sub-project	**Report Period / Date:**	
Location / Site:		**Weather Conditions:**	
Activities Inspected:			
Inspector Name:	**Position:**	**Organization:**	**Signature:**

SECTION 1: Environmental Parameters						
S.No.	**Performance Indicator**	**Yes**	**No**	**N/A**	**Observation / Measurement**	**Action Required / Remarks**

		(record value or describe condition)
1	Dust: Is water sprinkling active on access roads and earthwork areas? (Target: minimum twice daily; three times in hot/windy weather)	
2	Dust: Are all trucks transporting loose material (sand, gravel, soil) covered with tarpaulins before leaving the loading point?	
3	Dust: Is PM10 monitoring being conducted at the site boundary? Record last reading (µg/m³) and compare against NEQS 24-hr limit of 150 µg/m³	
4	Air Quality: Are exhaust emissions from generators and plant equipment visually within acceptable limits (no black/grey heavy smoke)?	
5	Noise: Are all noisy works restricted to 08:00–17:00 on weekdays only? No works on Fridays or public holidays?	
6	Noise: Record ambient noise level at nearest sensitive receptor (target: ≤45 dB(A) daytime per NEQS residential/rural limit)	
7	Noise: Is a community noise complaint log being maintained? Record number of noise complaints this period.	
8	Water Quality: Is the fuel/chemical storage bund intact, with impermeable liner and ≥110% containment capacity of largest vessel?	
9	Water Quality: Is vehicle washing and equipment maintenance restricted to a dedicated lined area ≥100 m from any watercourse?	
10	Water Quality: Any evidence of untreated wastewater discharge to natural drains, irrigation channels, or riverbeds? (Target: zero discharge events)	
11	Water Quality: Any fuel/oil spill observed? Record location, volume, and response action taken. (Target: zero spill incidents)	
12	Water Quality: Is camp wastewater (grey and black) collected and treated through a septic system? No direct ground discharge?	
13	Waste Management: Is waste segregated at source into separate labeled containers (construction debris, metal, plastic, organic, hazardous)?	
14	Waste Management: Are hazardous wastes (used oil, solvents, batteries, containers) collected separately and handed to a licensed waste handler with manifests?	
15	Waste Management: Is the site free of open burning or unauthorized dumping in drainage channels, riverbeds, or agricultural land?	
16	Waste Management: Are adequate	

	sanitation facilities present and maintained? (Target: minimum 1 toilet per 15 workers; separate male/female)					
17	Borrow Areas: Are all active borrow areas within approved boundary limits? (Mark 'No' if any encroachment or over-depth extraction observed)					
18	Borrow Areas: Are silt fences and cut-off drains installed and intact around all active borrow areas?					
19	Borrow Areas: Are closed/completed borrow areas restored (re-graded, topsoil replaced, re-vegetated) within required timeframe?					
20	Vegetation and Biodiversity: Is clearance strictly within the approved RoW footprint marked by physical pegs? No unauthorized clearance?					
21	Vegetation and Biodiversity: Record number of trees removed this period. Cumulative total vs. approved limit of 1 tree in RoW.					
22	Vegetation and Biodiversity: Are compensatory tree plantings on schedule? Record number planted to date vs. required (705 trees at 5:1 ratio).					
23	Vegetation and Biodiversity: Any evidence of unauthorized hunting, trapping, or wildlife disturbance by workers? (Target: zero incidents)					
24	Fuel and Chemical Storage: Is fuel storage area secure, labeled, equipped with fire extinguisher, and free of any leakage or seepage?					
25	Fuel and Chemical Storage: Is a spill response kit stocked and available at the fuel storage area and at each active work front?					
26	Site Housekeeping: Is the construction site and camp maintained in a clean, orderly condition? Waste bins present and regularly emptied?					
27	Chance Finds: Were any archaeological, cultural, or heritage artifacts encountered during excavation? If yes, was the Chance Find Procedure (Annexure D) followed immediately?					

SECTION 2: Social Parameters

S.No.	Performance Indicator	Yes	No	N/A	Observation / Measurement (record value or describe condition)	Action Required / Remarks
1	Community Access: Are all existing community footpaths and access routes maintained and open? If any route is blocked, is a clearly marked safe alternative provided?					
2	Community Access: Are site boundary fences and warning signs (in Urdu and pictograph format) in place at all active					

	work fronts and road crossing points?
3	Community Access: Is a traffic flag person stationed at all points where heavy vehicles cross or join community roads?
4	Community Access: Are all project vehicles observing the 20 km/h speed limit on community roads and 10 km/h through settlements? Record any violations this period.
5	Community Access: Was 72-hour advance notice provided to communities before any road closures or site access restrictions this period?
6	Community Engagement: Was the monthly FO briefing meeting held this period? Record date, number of participants (total, male, female).
7	Community Engagement: Has the non-technical ESMP summary in Urdu and Balochi been disclosed and shared with affected communities? Record disclosure date and format.
8	Community Engagement: Are GRM information boards (focal person name, contact number, complaint process) posted in Urdu and Balochi at camp entrance and all four FO offices?
9	Community Engagement: Are complaint boxes at FO offices, camp entrance, and site entrance being checked and logged weekly?
10	GRM Complaint Log Review: Record number of community complaints received this period. Record number resolved within 15 working days (target: 100%).
11	GRM Complaint Log Review: Are any complaints pending beyond 15 working days? If yes, specify reason and interim action communicated to complainant.
12	GRM Complaint Log Review: Were any GBV/SEA/SH complaints received this period? If yes, confirm handling by PIU Gender Specialist with full confidentiality.
13	VLD – Land Use and Condition: Is the World Bank's written no-objection for all 14 VLD parcels confirmed and on file before works on those parcels?
14	VLD – Land Use and Condition: Are all 14 VLD parcels being used only for the approved project purpose? No unauthorized activities on VLD land?
15	VLD – Land Use and Condition: Are any VLD landowners raising concerns? If yes, log through GRM and escalate to PIU Social Specialist within 3 working days.
16	Cultural Property: Are the three community mosques and three graveyards within the scheme area confirmed outside the active work

	footprint? No encroachment?					
17	Stakeholder Engagement Schedule: Is the agreed engagement schedule (monthly meetings, quarterly women consultations) being followed? Record compliance status.					

SECTION 3: Gender and Labor Parameters						
S.No.	**Performance Indicator**	**Yes**	**No**	**N/A**	**Observation / Measurement (record value or describe condition)**	**Action Required / Remarks**
1	CoC Compliance: Have all workers on site signed the Code of Conduct before site entry? Record total workers mobilized vs. number with signed CoC (target: 100%).					
2	CoC Compliance: Were any CoC violations reported or observed this period? (Specify type: GBV/SEA/SH, drug/alcohol, community harassment, unauthorized village access, wildlife disturbance)					
3	GBV/SEA/SH: Were any GBV/SEA/SH incidents reported through any channel (GRM, direct report, community feedback) this period? (Target: zero incidents)					
4	GBV/SEA/SH: Were GBV/SEA/SH awareness sessions held for workers this month? Record date, facilitator, and attendance (number, gender).					
5	GBV/SEA/SH: Were quarterly community GBV/SEA/SH awareness sessions held for surrounding communities (women-only session facilitated by female staff)?					
6	Worker GRM: Is the Worker GRM focal point accessible, named, and physically present at camp? Is the complaint intake available in Urdu, Balochi, and Sindhi for migrant workers?					
7	Worker GRM: Record number of worker grievances received this period, resolved within 15 days (target: 100%), and any outstanding unresolved complaints.					
8	Worker GRM: Is the Worker GRM complaint box at the camp cleared and logged weekly? Is the focal point contact information posted at the camp entrance?					
9	Women's Consultations: Was the required women's consultation session held this period (monthly worker awareness; quarterly community session)? Record date, facilitator, and attendance.					
10	Women's Consultations: Did women's consultations include substantive discussion of project impacts on women and girls (access, safety, livelihood)? Record key issues raised.					

11	PPE Availability: Are all PPE types available in adequate quantities and sizes for all workers including female workers? (Hard hats, safety boots, gloves, vests, dust masks, eye protection)	
12	PPE Compliance: Record PPE compliance rate (%) during this inspection for workers at active work fronts (target: 100%).	
13	Heat Stress Protocol: Are outdoor works suspended between 12:00 and 16:00 during May–August? Is shaded rest area provided at each work front?	
14	Heat Stress Protocol: Is potable water available at all work fronts at minimum 5 liters per worker per day? Record observed supply level.	
15	Heat Stress Protocol: Were any heat illness incidents recorded this period? (Exhaustion, heat stroke, fainting) – target: zero incidents; all incidents to be reported to PIU within 24 hours.	
16	Child and Forced Labor: Is the age verification register maintained and available? Record any under-18 workers identified (target: zero child labor)	
17	Child and Forced Labor: Are worker identity documents retained by workers themselves (not by Contractor)? No advance payments restricting worker freedom?	
18	Labor Rights: Are all workers paid at or above the Balochistan provincial minimum wage, weekly, with payslips? Record any wage complaints this period.	
19	Local Hiring: Record percentage of unskilled workers sourced from the four project villages this period (target: minimum 75%).	
20	Supply Chain: Was the primary supply chain screening completed for aggregate, steel, and cement suppliers before procurement? Are high-risk suppliers being spot-audited quarterly?	
21	OHS Induction and Training: Were all newly mobilized workers this period given OHS induction training before site entry? Record number inducted.	
22	OHS Incident Log: Record number of Lost Time Injuries (LTIs) this period (target: zero). Were all LTIs reported to PIU within 24 hours and World Bank within 48 hours?	
23	First Aid and Emergency: Is a stocked first-aid kit and a certified first-aider present at each active work front? Is the paramedic on site during active works?	

Completed by (Contractor EO):		**Date:**	

Reviewed by (PDSC E&S Specialist):		**Date:**	
Acknowledged by (PIU E&S Specialist):		**Date:**	

Notes: (1) For any 'No' response, describe the non-compliance in the 'Observation / Measurement' column and specify corrective action and responsible person in 'Action Required / Remarks'. (2) For any incident (OHS, GBV/SEA/SH, spill, chance find), also complete the relevant Incident Report form and submit to PIU immediately. (3) Record actual measured values where indicated (e.g., PM10 reading, noise level dB(A), PPE compliance %, worker numbers). (4) Attach photographic documentation and GRM log summary with each completed checklist submission. (5) This checklist does not replace the Monthly ESHS Report but forms its primary supporting document.

EO = Environmental Officer. PDSC = Project Design and Supervision Consultant. PIU = Project Implementation Unit. FO = Farmers Organization. GRM = Grievance Redress Mechanism. CoC = Code of Conduct. VLD = Voluntary Land Donation. GBV = Gender-Based Violence. SEA/SH = Sexual Exploitation and Abuse / Sexual Harassment. LTI = Lost Time Injury.

ANNEXURE-C
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 Environmental Code of Practices applies primarily to pre-construction and construction activities, and where relevant to operation-phase environmental management.

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	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

Activity	Environmental Impact	Environmental Management Guideline
	habitat of fish and other aquatic biology.	substances must not enter waterways, stormwater systems or underground water tables. Use environment-friendly and nontoxic slurry during the construction of piles to discharge into the river. Reduce infiltration of contaminated drainage through stormwater management design. Do not discharge cement and water curing used for cement concrete directly into watercourses and drainage inlets.
Discharge from construction sites	During construction both surface and groundwater quality may be deteriorated due to construction activities in the river, 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.	Install temporary sediment basins, where appropriate, to capture sediment-laden runoff from the site. Divert runoff from undisturbed areas around the construction site Stockpile materials away from drainage lines Prevent all solid and liquid wastes entering waterways by collecting solid waste, oils, chemicals, Bhitumen spray waste and 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 &	Water pollution from the storage, handling,	Follow the management guidelines proposed in ECoPs for Waste Management and Management of Fuels &

Activity	Environmental Impact	Environmental Management Guideline
disposal of hazardous material and waste	and disposal of hazardous materials and general construction waste, and accidental spillage	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

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. 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, wherever practical.

ECoP for Management of Fuels & Hazardous Substances

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

ECoP for Management of Soil Quality

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

ECoP for Air Quality

Activity	Environmental Impact	Environmental Management Guideline

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

ECoP for Noise & Vibration

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

Construction machinery	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	Appropriately site all noise-generating activities to avoid noise pollution to local residents. Install acoustic enclosures around generators to reduce noise levels. Fit high-efficiency mufflers to appropriate construction equipment. Use the quietest available plant and equipment. Modify equipment to reduce noise (for example, noise control kits, the lining of truck trays). Maintain all vehicles in accordance with manufactures maintenance procedures to ensure good working order

ECoP for Flora

Activity	Environmental Impact	Environmental Management Guideline
Vegetation clearance	Local flora is important to provide shelters for the fauna, offer fruits and/or timber/firewood and protect soil erosion. Such as damage to flora has a wide range of adverse environmental impacts.	Clear only the vegetation that needs to be cleared in accordance with the designs. These measures are Relevant 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,	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.

Activity	Environmental Impact	Environmental Management Guideline
	habitat and active nests	
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 PIU. 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 *(Aquila clanga)*-April and May ● Houbara Bustard (*Chlamydotis undulata*)-March & October ● Black-tailed Godwit (*Limosa limosa)*-March to August **<u>Reptiles</u>** ● Bengal Monitor (Varanus bengalensis)-June to September ● Tortoise Afghan *(Testudo horsfieldii*)-May or June **<u>Mammals</u>** ● Common Hill fox (Vulpes vulpes)- December or February ● Chinkara (Gazella bennetti-August to Ocotober & March *to April*

Activity	Environmental Impact	Environmental Management Guideline
General construction works	Construction works may pose health and safety risks to the construction workers and site visitors leading to severe injuries and deaths. The population in the proximity of the construction site and the construction workers will be exposed to a number of) biophysical health risk factors, (e.g. noise, dust, chemicals, construction material, solid waste, wastewater, vector transmitted diseases, etc), i)risk factors resulting from human behavior (e.g. STD, HIV, etc) and (iii) Road accidents from construction traffic.	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, health, and safety manager to look after the health and safety of the workers. Inform the local authorities responsible for health, religious and security before the commencement of civil works and establishment of construction camps so as to maintain effective surveillance over public health, social and security matters. The Contractor shall follow the ECoPs presented in the following tables to reduce health risks to the construction workers and nearby community

ECoP for Traffic Management

Activity	Environmental Impact	Environmental Management Guideline
Construction vehicular traffic	Increased traffic use of roads by construction vehicles will affect the movement of normal road traffics and the safety of the road-users. Accidents and spillage of fuels and chemicals	Restrict truck deliveries, where practicable, today time working hours. Restrict the transport of oversize loads. Operate road traffics/transport vehicles, if possible, at non-peak periods to minimize traffic disruptions. Enforce on-site speed limit. Prepare and submit a traffic management plan to Supervisory 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:

Activity	Environmental Impact	Environmental Management Guideline
Safety	Inadequate safety facilities at the construction camps may create security	Provide appropriate security personnel (police /home guard or private security guards) and enclosures to prevent unauthorized entry into the camp area.
	problems and fire hazards	Maintain register to keep track of personnel present in the camp at any given time. Encourage the use of flameproof material for the construction of the labor housing/site office. Ensure that these houses/rooms are of sound construction and capable of withstanding storms/cyclones. Provide the appropriate type of firefighting equipment's suitable for the construction camps. Display emergency contact numbers clearly and prominently in strategic places in camps. Communicate the roles and responsibilities of Laborers in case of an emergency in the monthly meetings with contractors.
Construction Camp Facilities	Lack of proper infrastructure facilities, such as housing, water supply, and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards.	Adequate housing for all workers. Safe and reliable water supply. Water supply from tube wells that meets the national standards. Hygienic sanitary facilities and sewerage systems. Provide separate latrines and bathing places for males and females with total isolation by a wall or by location. Female toilets should be clearly marked in a language understood by the persons using them to avoid miscommunication. Treatment facilities for sewerage of toilet and domestic wastes Stormwater drainage facilities – shallow v drains should be provided on both sides of any camp roads to drain off stormwater. Pave the internal roads of at least haring-bond bricks to suppress dust and to work against a possible muddy surface during monsoon. Provide in-house community/common entertainment facilities. The dependence of local entertainment outlets by construction staff is to be discouraged/prohibited to the extent possible.

Disposal of waste	Management of wastes is crucial to minimize impacts on the environment, such as soil or water pollution.	Ensure proper collection and disposal of solid wastes within the construction camps. Encourage waste separation by source; organic wastes in one container and inorganic wastes in another container at the household level. Store inorganic wastes in a safe place within the household and clear organic wastes on a daily basis to waste collectors. Establish waste collection, transportation and disposal systems supported by adequate manpower and equipment/vehicles. Dispose of organic wastes in a designated safe place on a daily basis. At the end of the day cover the organic wastes with a thin layer of sand so that flies, mosquitoes, dogs, cats, rats, etc. are not attracted. Where waste is disposed of in a pit take care to protect groundwater from contamination by leachate formed due to decomposition. Cover the bed of the pit with an impervious layer of materials (clay, thin concrete) to protect groundwater from contamination. Locate the garbage pit/waste disposal site min 500 m away from the residence so that peoples are not disturbed with the odor likely to be produced from anaerobic decomposition of wastes at the waste dumping places. Encompass the waste dumping place with fencing to prevent access to children. Do not establish site-specific landfill sites. All solid waste will be collected and removed from the work camps and disposed of in the approval of waste disposal sites.

ANNEXURE-D

CHANCE FIND PROCEDURES FOR CULTURAL HERITAGE FINDS

(Archaeological and Others)

1. Identify the protected sites in the project areas and ensure that there is no protected monument within 200 feet from a proposed project site. If the proposed site is not located in a notified area, and there are no apparent archaeological values associated with the site, take no further action.
2. If, during the implementation of works, unlisted cultural heritage is encountered in any form, the Irrigation and Power Department shall contact:
   Directorate of Archaeology and Museums
   Culture, Tourism and Archives Department, Quetta Tel: 081-283 3595
3. If the site falls within the boundaries of a protected archaeological site or monument, then depending on its classification the relevant conservation authority (if federally protected, Department of Archaeology and Museums) will determine the level of development allowable, and the Relevant conditions.
4. The Department for Irrigation and Power shall obtain written record of the assessment of the potential impacts on the site, by the Balochistan or federal Department of Archaeology and Museums – whatever the case might be.
5. The Irrigation and Power Department will liase with the Provincial and/or Federal conservation authority to ensure that any chance finds are managed and protected.

Chance Find Procedure

Chance finding procedures which will be used during this scheme are as follows:

- Stop the construction activities in the area of the chance find;
- Delineate the discovered site or area;
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and the Antiquities Department take over;
- Notify the ESS team/supervisory Engineer who in turn will notify the Antiquities Department immediately (within 24 hours or less);
- Responsible local authorities and Antiquities Department would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the Antiquities Department (within 72 hours). The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
- Decisions on how to handle the finding shall be taken by the authorities responsible and Antiquities Department. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;
- Implementation for the authority decision concerning the management of the finding shall be communicated in writing by the Antiquities Department; and Construction work could resume only after permission is given from the responsible local authorities and the Antiquities Department concerning safeguard of the heritage. These procedures must be referred to as standard provisions in construction contracts, when Relevant. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered or observed.

ANNEXURE-E

FORMAT OF A MONTHLY MONITORING REPORT

Scope of Works

Provide a summary regarding the engineering activities

Summary of non-compliances

This section summaries 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*
	------	-----	-----	------

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-F

CERTIFICATE OF ENVIRONMENTAL MONITORING LAB

CERTIFICATE

ANNEXURE-G

E&S Risk Screening Table (as per ESS1 and ESS4)

Purpose: This table screens the Jalal Khan Flood Dispersal/Weir sub-project for potential environmental and social (E&S) risks and determines the level of assessment required. It is included as a technical annex to the Preliminary Site Assessment Report. This sub-project is located in District Kachhi, Balochistan. The preliminary overall risk classification is Substantial, consistent with the BWSPIP ESMF categorization. All identified risks are manageable through the site-specific ESMP, the Contractor's ESMP (C-ESMP), and associated sub-plans. No major irreversible environmental or social impacts are anticipated.

No.	Activity / Risk Area	Key Environmental Risks	Key Social Risks	Mitigation / Management Measures	Risk Category	Implementation by Whom (Primary / Secondary)	Procedural Reference in Main ESMP Report
1	**Sediment and Soil Erosion (embankment works, borrow areas, access roads)**	• Sediment inflow to Nari River and irrigation channels from exposed embankment slopes and borrow pits • Topsoil loss and land degradation at borrow areas and along construction RoW • Increased turbidity in surface watercourses during monsoon phase	• Downstream siltation affecting tail-end agricultural land and irrigation intakes • Temporary land use disruption at borrow areas and stockpile locations	• Install silt fences, check dams, and sediment traps at all active earthwork fronts before works begin • Maintain 10 m un-disturbed buffer from active watercourses during construction • Implement borrow area rehabilitation plan: re-grade, replace topsoil, re-vegetate within 30 days of last use • Stabilize exposed slopes by compaction, stone pitching, or mulching within 72 hours of completion in each section • Sign formal written agreements with each borrow area landowner before extraction (see ESS5 / Sec. 3.3.4)	**Moderate**	**Primary: Contractor Environmental Officer / Site Engineer** Secondary: PDSC Environmental Specialist (monthly verification) Oversight: PIU Environmental Specialist	**Table 7-5, Row: Soil Erosion** Sec. 3.3.4 (Borrow Area) Sec. 6.5.1 (Topography and Soil) Annexure C (ECOPs)
2	**Dust and Air Quality (earthworks, material transport, crushing/batching)**	• Fugitive dust from earthworks, unpaved access roads, and material handling	• Community health impacts for residents of four project villages (nearest: Rehanzai	• Water access roads and earthwork areas at least twice daily; three times daily in dry/windy	**Moderate**	**Primary: Contractor Environmental Officer** Secondary: PDSC Environmental Specialist	**Table 7-5, Row: Dust and Air Quality** Sec. 6.6.1, 6.6.2 (Air Quality, Dust)

		• Vehicle exhaust and generator emissions; PM10 and PM2.5 exceedances during peak earthworks (May–June)	New, 1.145 km) • Respiratory health risk for workers during earthworks and material handling	weather (May–June) • Cover all material transport trucks with tarpaulins before leaving loading point • Locate batching/crushing plant minimum 500 m downwind from nearest settlement • Provide FFP2 minimum dust masks to all earthworks and material handling workers • Monitor PM10 monthly at site boundary; compare against NEQS 24-hr limit of 150 µg/m³		(monthly PM10 review) Oversight: PIU Environmental Specialist	Annexure B, Section 1 (Env. Parameters) NEQS Air Standards
3	**Noise and Vibration (machinery, compaction, concrete works)**	• Noise from heavy construction machinery, compaction equipment, and concrete batching • Ground vibration from compaction equipment and heavy vehicles near structures	• Disturbance to residents and community activities in the four project villages • Interference with school hours and Friday prayers if works not restricted	• Restrict all noisy works to 08:00–17:00 on weekdays only; no works on Fridays or public holidays • Maintain all equipment to manufacturer service schedule; fit mufflers on generators and compressors • Notify community and FOs 48 hours in advance before high-noise activities start • Monitor noise monthly at nearest sensitive receptor; target ≤45 dB(A) daytime per NEQS	**Low**	**Primary: Contractor OHS Officer** Secondary: PDSC Environmental Specialist (monthly noise measurement) Oversight: PIU Environmental Specialist	**Table 7-5, Row: Noise and Vibration** Sec. 6.6.4 (Noise and Vibration) NEQS Noise Standards
4	**Water Quality (fuel/chemical spills, wastewater, runoff)**	• Fuel and oil spills contaminating surface water, groundwater, and irrigation channels • Untreated camp	• Contamination of community drinking water sources and irrigation supply	• Establish bunded fuel storage with impermeable liner at 110% containment capacity • Designate vehicle wash/refuel area	**Moderate**	**Primary: Contractor Environmental Officer** Secondary: PDSC Environmental Specialist (quarterly sample review)	**Table 7-5, Row: Water Quality** Sec. 6.6.7 (Surface and Groundwater Pollution) NEQS Water Standards NDWQS

		wastewater and sanitation discharge to drains or riverbeds • Construction runoff increasing turbidity in Nari River and irrigation canals	• Health risk for downstream communities relying on Nari River for water	minimum 100 m from watercourses; lined and drained to sump • Treat all camp wastewater through septic system; zero direct discharge • Quarterly surface water sampling (pH, turbidity, coliforms, heavy metals) by accredited lab • On-site spill kit at fuel storage and each active work front; spill response within 30 minutes		Oversight: PIU Environmental Specialist	
5	**Waste Management (construction debris, hazardous waste, camp waste)**	• Generation of construction debris, concrete waste, metal scrap, and packaging materials • Hazardous waste: used lubricants, solvents, chemical containers, batteries • Risk of unauthorized dumping in drainage channels, riverbeds, or agricultural land	• Nuisance and health risk to communities from unmanaged site waste • Sanitation risks in camp affecting worker and community health	• Prepare and implement Waste and Spoil Management Plan before works start • Segregate all waste at source: construction debris, plastic, organic, hazardous in labeled containers • Hazardous waste collected by licensed handler with transfer manifests; no on-site burning • Maintain minimum 1 sanitation facility per 15 workers; separate male/female; clean daily • Remove all construction waste within 30 days of completing each section of works	**Low**	**Primary: Contractor Environmental Officer** Secondary: PDSC Environmental Specialist (monthly audit) Oversight: PIU Environmental Specialist	**Table 7-5, Row: Waste Management** Sec. 6.6.6 (Waste Management) Sec. 7.8.2 (Waste and Spoil Management Plan) Annexure B, Section 1
6	**Vegetation and Biodiversity (site clearance, borrow areas)**	• Removal of 1 trees within approved RoW • Disturbance to riparian vegetation along Nari River banks • Risk of clearance	• Loss of tree cover used by local communities for shade, fodder, and fuelwood • Risk of unauthorized hunting and fuelwood	• Restrict clearance strictly to approved RoW footprint marked by physical pegs before any machinery enters • Compensate tree loss at 5:1	**Low**	**Primary: Contractor Environmental Officer / Site Engineer** Secondary: PDSC Environmental Specialist (pre-clearance check + 12-month	**Table 7-5, Row: Vegetation and Tree Loss** Table 7-5, Row: Fauna and Biodiversity

		beyond approved RoW if boundaries not marked	collection by camp workers	ratio (705 trees) with native species planted in community areas • Pre-clearance walk-through by PDSC Environmental Specialist before site clearance begins • Prohibit workers from hunting, trapping, fishing, or collecting fuelwood; include in CoC • Carry out clearance outside main bird breeding season (March–June) where schedule permits		plantation survival audit) Oversight: PIU Environmental Specialist	Sec. 6.6.5 (Loss of Vegetation) Sec. 6.6.8 (Fauna)
7	**Community Health and Safety (traffic, site hazards, access)**	• Traffic accidents from heavy construction vehicles on community roads • Community member access to active construction zones	• Risk to pedestrians and children from heavy vehicle movement through settlements • Disruption to community access routes and farm tracks during construction	• Prepare and implement Community Health and Safety Plan (CHSP) before mobilization • Erect site fencing and safety barriers at all active work fronts before earthworks begin • Enforce 20 km/h vehicle speed limit on community roads; 10 km/h through settlements • Assign traffic flag persons at all points where heavy vehicles cross community roads • Maintain all existing community access routes; provide safe alternatives 72 hrs before any closure	**Moderate**	**Primary: Contractor CLO / OHS Officer** Secondary: PDSC Social Specialist (monthly access route inspection) Oversight: PIU Social Specialist	**Table 7-5, Row: Community Health and Safety** Sec. 6.6.10, 6.6.12 (Community Movement) Sec. 7.8.6 (Community Health and Safety Plan) Annexure B, Section 2
8	**Labor Influx and GBV/SEA/SH**	• Increased pressure on local resources, sanitation, and social	• GBV/SEA/SH risk for women and girls in project villages from	• Prepare and submit standalone SEA/SH Action Plan to World	**Substantial**	**Primary: Contractor HR Officer / CLO** Secondary: PDSC Social Specialist / PIU	**Table 7-5, Row: Labor Influx and GBV/SEA/SH** Sec. 6.6.11 (Labor Influx)

		services due to labor influx • Worker-community interface risks including GBV, SEA/SH	incoming workforce • Social friction between local and migrant workers if community norms not respected • Risk of child labor, forced labor, or wage exploitation	Bank before contract award • Locate camp minimum 500 m from nearest village; restrict worker movement to camp and worksites • Zero-tolerance CoC signed by all workers before site entry; immediate dismissal for any GBV/SEA/SH violation • Monthly worker GBV/SEA/SH awareness sessions; quarterly community sessions (women-only by female facilitator) • Hire minimum 75% unskilled labor from four project villages; coordinate through FOs		Gender Specialist (monthly audit) Oversight: PIU Social Specialist / World Bank	Sec. 6.6.13 (GBV/SEA/SH) Sec. 7.6.13–7.6.14 (GRM Protocols) BWSPIP LMP; SEA/SH Action Plan
9	**Labor and Working Conditions (ESS2 compliance)**	• Occupational health and safety risks from heavy equipment, excavation, heat, dust	• Wage exploitation, child labor, forced labor, or debt bondage risk • Limited access for workers to grievance channels, especially migrant workers • Primary supply chain labor rights risk (aggregate, steel, cement suppliers)	• All workers paid at or above Balochistan provincial minimum wage; payslips provided weekly • Verify worker age through CNIC before hiring; zero under-18 workers • Worker GRM operational before mobilization: named focal point, intake in Urdu, Balochi, Sindhi • Conduct primary supply chain screening for high-risk suppliers before procurement; quarterly spot audits • All workers receive OHS induction and	**Substantial**	**Primary: Contractor HR Officer** Secondary: PDSC Social Specialist (monthly payroll sample review) Oversight: PIU Social Specialist / World Bank	**Table 7-5, Row: Labor and Working Conditions** Sec. 7.6.14 (Workers GRM) BWSPIP LMP Balochistan OSH Act 2022 Balochistan Factories Act 2021

				sign CoC before site entry			
10	**Voluntary Land Donation (VLD) (14 parcels, 60.68 acres)**	• No direct physical environmental risk; risk of land use conflict if documentation incomplete	• Risk of coercive or uninformed land donation without genuine free, prior, informed consent • 14 VLD parcels (60.68 acres) donated without prior World Bank no-objection • Missing VLD mitigation and monitoring provisions in ESMP and ESMMP	• Submit complete VLD documentation for all 14 parcels to World Bank before contract award • Confirm each landowner voluntarily consented with no pressure; donated area <10% of total holding • No works on VLD parcels until World Bank written no-objection received by PIU • VLD landowner consultation records (including confirmed consultations with all affected owners) filed with PIU • Post-construction land condition inspection of all 14 parcels within 6 months of works completion	**Substantial**	**Primary: PIU Social Specialist** Secondary: PDSC Social Specialist (VLD parcel monthly monitoring) Oversight: PIU / World Bank	**Sec. 4.2 (VLD Mechanism)** Table 7-5, Row: Voluntary Land Donation BWSPIP RPF ESS5 (VLD Note)
11	**Stakeholder Engagement and GRM**	• No direct environmental risk	• Risk of inadequate community information on project impacts and GRM access • Risk of elite capture or exclusion of women, vulnerable groups from consultation forums • Non-disclosure of ESMP in local languages before civil works commence	• Prepare non-technical ESMP summary in Urdu and Balochi; disclose before civil works start • Post GRM information in Urdu and Balochi at FO offices and camp entrance • Monthly FO briefing meetings with gender-disaggregated attendance records • GRM: acknowledge complaints within 72 hours; resolve within 15 working days • Dedicated confidential	**Moderate**	**Primary: Contractor CLO / PIU Social Specialist** Secondary: PDSC Social Specialist (quarterly engagement audit) Oversight: PIU Social Specialist / World Bank	**Table 7-5, Row: Stakeholder Engagement and GRM** Sec. 5.2 (Consultation Methodology) Sec. 7.6 (GRM) BWSPIP SEP ESCP Disclosure Requirements

				SEA/SH GRM channel managed by PIU Gender Specialist			
12	**Cultural Heritage and Chance Finds (mosques, graveyards, archaeology)**	• Potential sub-surface archaeological finds during excavation and earthworks • Three community mosques and three graveyards located within the scheme area	• Unintended disturbance to cultural or religious properties if boundaries not confirmed • Community and religious sensitivity if chance finds are not handled properly	• Confirm boundaries of all three mosques and three graveyards are outside the approved work footprint before works start • Brief all workers and supervisors on Chance Find Procedure (Annexure D) before earthworks begin • On any find: stop all works within 50 m immediately; report to PIU within 4 hours; notify Balochistan Department of Archaeology within 24 hours • No works resume until written clearance from the Archaeology Department is received	**Low**	**Primary: Contractor Site Engineer** Secondary: PDSC Environmental Specialist (pre-works cultural property check) Oversight: PIU Environmental Specialist	**Sec. 7.8.12 (Chance Find Procedure)** Annexure D (Chance Find Procedures) Table 7-5, Row: Cultural Heritage Balochistan Antiquity Act 2014

Summary Assessment

- Overall preliminary risk classification: Substantial – consistent with the BWSPIP ESMF categorization.
- No major irreversible environmental or social impacts are anticipated from this sub-project.
- All identified risks are manageable through the site-specific ESMP, the Contractor's ESMP (C-ESMP), and associated sub-plans.
- Highest-risk areas are: Labor Influx/GBV/SEA/SH, Labor and Working Conditions (ESS2), and Voluntary Land Donation (ESS5) – all rated Substantial.
- The Contractor must prepare and submit all required sub-plans (C-ESMP, OHS Plan, CHSP, SEA/SH Action Plan, Security Management Plan) before civil works commence.
- PIU to coordinate with Environmental and Social Specialists for final risk classification review at detailed design stage.
- This sub-project is located in District Kachhi, Balochistan. All geographic references in this annex apply to District Kachhi only.

Risk categories: Low (manageable with standard ECOPs), Moderate (specific mitigation required), Substantial (detailed ESMP and monitoring required), High (major study/redesign required).

CLO = Community Liaison Officer. PDSC = Project Design and Supervision Consultant. PIU = Project Implementation Unit. VLD = Voluntary Land Donation. GBV = Gender-Based Violence. SEA/SH = Sexual Exploitation and Abuse/Sexual Harassment. CoC = Code of Conduct. FO = Farmers Organization. LMP = Labor Management Procedures. RPF = Resettlement Policy Framework.

ANNEXURE-H

The annexed laboratory reports are used here as baseline analytical results. Compliance discussion in the ESMP should rely on Relevant NEQS and

supplementary GIIP references, not on unsupported references to non-Relevant provincial standards.

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

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Analysis Report **Report # SES/ENV/JAN/26/3105/3995-A** **Date: 27-JAN-2026**

Description

Job Location	Killi Jalal Khan Bag Nari	**Testing Instrument**	24 Hours Air Monitoring Station
District	Kachi /Bolan	**Job Date**	23-JANUARY-2026
Client Name	**Balochistan Water Security Productivity Improvement Project**		
Client Address	**Balochistan**		

Air Quality Test Report

Parameters	Temp	NO	NO_2	SO_2	CO	PM2.5	PM 10	SPM	O_3
NEQS limits	-	40	80	120	5	75	150	500	130
Unit	°C	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³
TIME	RESULTS								
11:30AM	35°C	09.43	23.17	2.02		29.4	46.2	75.6	05
12:30PM	35°C	10.28	21.56	1.28	0.051	23.5	41.6	65.1	-
01:30PM	35°C	08.24	24.63	1.59		25.4	44.8	70.2	-
02:30PM	35°C	07.51	22.52	1.84		27.6	40.9	68.5	-
03:30PM	34°C	09.67	26.74	2.02	0.046	28.9	43.7	72.6	-
04:30PM	35°C	10.25	24.33	1.46		26.2	42.5	68.7	-
05:30PM	37°C	08.51	21.58	1.34		28.1	41.3	69.4	-
06:30PM	36°C	09.27	23.74	1.96	0.062	20.5	47.2	67.7	-
07:30PM	35°C	07.36	24.64	1.65		27.6	45.8	73.4	-
08:30PM	35°C	09.29	25.86	1.26		23.9	40.9	64.8	-
09:30PM	29°C	06.35	22.71	1.31	0.041	24.7	43.1	67.2	-
10:30PM	28°C	05.63	20.53	1.16		22.1	44.9	67.4	-
11:30PM	27°C	06.92	19.78	1.06		27.6	40.2	67.8	-
12:30AM	25°C	05.01	18.26	1.28	0.037	29.5	39.6	69.2	-
01:30AM	26°C	04.37	18.06	1.52		26.2	38.9	65.1	-
02:30AM	28°C	04.29	17.26	1.18		24.8	37.3	61.3	-
03:30AM	27°C	04.32	17.08	1.27	0.024	21.6	35.4	57.4	-
04:30AM	28°C	04.22	17.65	1.02		20.9	33.7	54.6	-
05:30AM	25°C	03.91	16.37	0.96		21.7	31.5	53.2	-
06:30AM	27°C	03.98	16.58	1.13	0.021	19.2	30.8	50.1	-
07:30AM	28°C	04.16	17.39	1.05		18.3	31.9	50.2	-
08:30AM	28°C	04.58	17.44	1.29		19.6	29.5	49.1	-
09:30AM	29°C	05.05	18.28	1.21	0.029	20.8	33.4	54.2	-
10:30AM	29°C	07.19	20.84	1.32		23.5	36.5	60.1	-
AVERAGE	30.7°C	6.66	20.71	1.38	0.013	24.23	39.23	63.45	05

Note:
SEQS=Sindh 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
BDL=Below Detectable Limit
OL= Out of Limit
ND=Not Detected

Field Analyst: Mohsin Saeed Chief Chemist: Kashif Ahmed

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

SUSTAINABLE ENVIRONMENTAL SERVICES SES

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Analysis Report **Report # SES/ENV/JAN/26/3105/3995-B** **Date: 27-JAN-2026**

Description

Job Location	Killi Jalal Khan Bag Nari	**Testing Instrument**	24 Hours Air Monitoring Station
District	Kachi /Bolan	**Job Date**	23-JANUARY-2026
Client Name	**Balochistan Water Security Productivity Improvement Project**		
Client Address	**Balochistan**		

Ambient Air Quality Monitoring

Sr.	Measuring Parameters	Unit	WHO Limit	NEQS & BEQS Limits	Average Test Result	Remarks
1.	Oxide Of Nitrogen as (NO)	$\mu g/m^3$	-	40 (24 hrs.)	6.66	WL
2.	Oxide Of Nitrogen as (NO_2)	$\mu g/m^3$	25(24 hrs.)	80 (24 hrs.)	20.71	WL
3.	Sulphur Dioxide (SO_2)	$\mu g/m^3$	40(24 hrs.)	120 (24 hrs.)	1.38	WL
4.	Carbon Monoxide (CO)	mg/m^3	4(24 hrs.)	5 (08 hrs.)	0.013	WL
5.	Particulate Matter (PM 2.5)	$\mu g/m^3$	15(24 hrs.)	35 (24 hrs.)	24.23	WL
6.	Particulate Matter (PM 10)	$\mu g/m^3$	45(24 hrs.)	150 (24 hrs.)	39.23	WL
7.	SPM	$\mu g/m^3$	-	500 (24 hrs.)	63.45	WL
8.	Ozone (O_3)	$\mu g/m^3$	60(Peek Season)	130 (01 hr.)	05	WL

Note:

SEQS=Sindh 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
BDL=Below Detectable Limit
OL= Out of Limit
ND=Not Detected

Field Analyst: Mohsin Saeed Chief Chemist: Kashif Ahmed

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

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Analysis Report **Report # SES/ENV/JAN/26/3105/3995-C** **Date: 27-JAN-2026**

Description

Quantity of sample	1.0 Liter	Sampling Methodology	Grab	Job Date	23-JANUARY-2026
Analysis Type	Chemical Analysis		Sampling Location		Rehanzai/Jalal Khan
Client Name:	Balochistan Water Security Productivity Improvement Project				
Client Address:	Balochistan				

Surface Water Report

S #	Parameters	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Result	Remarks
01	Total Bacteria Count	TBC (count/ml)	Total Viable Count	----------	----------	----------	09	-
02	Total Coliform	TC (count/ml)	APHA 922 B	0/100 ml	0/100 ml	0/100 ml	204	OL
03	E-Coli	EC(count/ml)	Total Viable Count	0/100 ml	0/100 ml	0/100 ml	144	OL
04	Facial Coli	FC (count/ml)	APHA 922 B	0/100 ml	0/100 ml	0/100 ml	70	OL
05	Turbidity	NTU	HACH Turbidity meter	<5	<15	<15	< 0.08	WL
06	Taste	Taste	Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-obj	WL
07	Odour	Odor	Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-obj	WL
08	Colour	TCU	Pt-Co method	≤ 15 TCU	≤ 15 TCU	≤ 15 TCU	< 3	WL
09	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	-	-	-	ND	WL
10	Residual chlorine	Cl_2 (mg/L)	HACH Method 8167	0.2-0.5	-	0.2-0.5	0.4	WL
11	pH @ 25 °C	PH	ASTM D-1293	6.5 to 8.5	6.5 to 8.5	6.5 to 8.5	8.16	WL
12	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	< 1000	< 1000	< 1000	335	WL
13	Total Hardness	AsCOCO3(mg/L)	APHA 2340-C	< 500	-	< 500	91	WL
14	Fluoride	F^{-1} (mg/L)	APHA 4500-F^{-1}	≤1.5	1.5	≤ 1.5	0.74	WL
15	Chloride	Cl^{-1} (mg/L)	APHA 4500-Cl^{-1}	< 250	250	< 250	131	WL
16	Cyanide	CN^{-1}(mg/L)	HACH Method 8027	≤ 0.05	0.07	≤ 0.05	ND	WL
17	Nitrate	NO_3^{-1} (mg/L)	HACH Method 8192	≤ 50	50	≤ 50	0.25	WL
18	Nitrite	NO_2^{-1} (mg/L)	APHA 4500-NO_2^{-1}-B	≤ 3.0(P)	3	≤ 3.0(P)	0.04	WL
19	Antimony	Sb (mg/L)	ASTM D-3697	≤ 0.005	0.02	≤ 0.005	ND	WL
20	Aluminum	Al(mg/L)	ASTM D-857	≤ 0.2	0.2	≤ 0.2	0.10	WL
21	Arsenic	As (mg/L)	ASTM D-2972	≤ 0.05	0.01	≤ 0.05	ND	WL
22	Boron	B (mg/L)	ASTM D-3082	0.3	0.3	0.3	ND	WL
23	Barium	Ba(mg/L)	ASTM D-4382	0.7	0.7	0.7	0.007	WL
24	Chromium Total	Cr(mg/L)	ASTM D-1687	≤ 0.05	0.05	≤ 0.05	ND	WL
25	Copper	Cu (mg/L)	ASTM D-1688	2	2	2	<0.07	WL
26	Cadmium	Cd(mg/L)	ASTM D-3557	0.01	0.003	0.01	ND	WL
27	Lead	Pb(mg/L)	ASTM D-3559	≤ 0.05	0.01	≤ 0.05	ND	WL
28	Manganese	Mn(mg/L)	ASTM D-858	≤ 0.5	0.5	≤ 0.5	ND	WL
29	Mercury	Hg (mg/L)	ASTM D-3223	≤ 0.001	0.001	≤ 0.001	ND	WL
30	Nickel	Ni(mg/L)	ASTM D-3866	≤ 0.02	0.02	≤ 0.05	ND	WL
31	Selenium	Se(mg/L)	ASTM D-3858	0.01	0.01	0.01	ND	WL
32	Zinc	Zn (mg/L)	ASTM D-1691	5	3	5	1.2	WL

Note:

SEQS=Sindh 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
BDL=Below Detectable Limit
OL= Out of Limit
ND=Not Detected

Field Analyst: _____ Mohsin Saeed

Chief Chemist: _____ Kashif Ahmed

SUSTAINABLE ENVIRONMENTAL SERVICES

SUSTAINABLE ENVIRONMENTAL SERVICES SES

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New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
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Analysis Report **Report # SES/ENV/JAN/26/3105/3995-D** **Date: 27-JAN-2026**

Description

Quantity of sample	1.0 Liter	Sampling Methodology	Grab	Job Date	23-JANUARY-2026
Analysis Type	Chemical Analysis		Sampling Location		Rehanzai/Jalal Khan
Client Name:	Balochistan Water Security Productivity Improvement Project				
Client Address:	Balochistan				

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	33.1
2	pH @ 25 °C	pH	ASTM D-1293	6 to 9	6 to 9	6 to 9	7.30
3	Biological Oxygen Demand	BOD_5 (mg/L)	APHA 5210	80	80	80	65.5
4	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	150	150	131
5	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500	3500	3500	1921
6	Total Suspended Solids	TSS (mg/L)	APHA 2540-D	200	200	200	111.7
7	Oil & Grease	O.Gr(mg/L)	ASTM D-4281	10	10	10	0.04
8	Chloride	Cl^{1-} (mg/L)	ASTM D-512	1000	1000	1000	515
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	4.1
11	Anionic Detergent	Det (mg/L)	ASTM D-6173	20	20	20	5.1
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	0.21
14	Ammonia	NH3(mg/L)	ASTM D-1426	40	40	40	15.1
15	Cadmium	Cd^{-2} (mg/L)	ASTM-D3557	0.1	0.1	0.1	<0.7
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	0.041
18	Lead	Pb^{-2} (mg/L)	ASTM-D3559	0.5	0.5	0.5	0.9
19	Mercury	Hg^{-2} (mg/L)	Kit Method	0.01	0.01	0.01	ND
20	Nickel	Ni^{-2} (mg/L)	HACH Dimethylglyoxime Method	1.0	1.0	1.0	ND
21	Silver	Ag (mg/L)	ASTM-D3866	1.0	1.0	1.0	ND
22	Zinc	Zn^{-2} (mg/L)	HACH Zincon Method	5.0	5.0	5.0	0.7
23	Total Iron	Fe2+ (mg/L)	APHA 3500-Fe	8.0	8.0	8.0	0.4
24	Manganese	Mn^{-2}(mg/L)	APHA 3500-Mn	1.5	1.5	1.5	0.08
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	216
27	Arsenic	As (mg/L)	Palintest Kit	1.0	1.0	1.0	ND
28	Copper	Cu^{2+} (mg/L)	HACH Biquinoline Method	1.0	1.0	1.0	0.04
29	Chlorine	Cl2 (mg/L)	HACH DPD Method	1.0	1.0	1.0	ND
30	Aluminum	Al (mg/L)	HACH Eriochrome Cyanine R	1.0	1.0	1.0	ND
31	Total KjheldalNtrogen	(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:

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Field Analyst: Mohsin Saeed Chief Chemist: Kashif Ahmed (SES)

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

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Analysis Report **Report # SES/ENV/JAN/26/3105/3995-E** **Date: 27-JAN-2026**

Description

Job Location:	Killi Jalal Khan Bag Nari	**Testing Instrument:**	Noise Meter
District	Kachi /Bolan	**Job Date:**	23-JANUARY-2026
Client Name:	**Balochistan Water Security Productivity Improvement Project**		
Client Address:	**Balochistan**		

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	61.3
02					11:00AM	63.8
03					12:00PM	62.4
04					01:00PM	65.7
05					02:00PM	64.1
06					03:00PM	62.7
07					04:00PM	59.8
08					05:00PM	63.6
09					06:00PM	64.8
10					07:00PM	61.9
11					08:00PM	59.3
12					09:00PM	58.9
13					10:00PM	58.2
14			55 dB(A) (Night time)	65 dB(A) (Night time)	11:00PM	46.8
15					12:00AM	48.3
16					01:00AM	49.7
17					02:00AM	50.8
18					03:00AM	52.3
19					04:00AM	55.1
20					05:00AM	47.4
21					06:00AM	52.5
22			65 dB(A) (Day time)	75 dB(A) (Day time)	07:00AM	53.6
23					08:00AM	54.7
24					09:00AM	55.3
Average Result						55.58

Note:
SEQS=Sindh 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
BDL=Below Detectable Limit
OL= Out of Limit
ND=Not Detected

Field Analyst: Mohsin Saeed Chief Chemist: Kashif Ahmed

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

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ANNEXURE-I

ENVIROMENTAL AND SOCIAL SCREENING CHECKLIST (B)

Component 1: Community Infrastructure Rehabilitation

A	**General Information**	
1	Subproject Location	**District: Kachhi Village**: **Jalal Khan** & other Villages
2	Package	
3	Subproject Activities	Flood Dispersal/Weir and Allied Structures at Jalal Khan in Nari River Basin
4	Proposed Date of Commencement of Work	
5	Important geographic / topographic feature (if any)	N/A
6	Important biological feature (if any)	N/A
7	Sensitive Receptors within 200 m	No Sensitive Receptors 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	✓				Clearing of scattered grosses and bushed may be removed.
2	Will the subproject require the setting up of ancillary facilities?	Yes	✓				Temporary camp
3	Will the subproject require a large amount of raw or construction materials, energy and/or water?	Yes		✓			Cement, mud and sands etc. may be required.
4	Will the subproject generate large amounts of residual wastes, construction material waste?	No					No residual waste, construction material waste is expected following the proposed wm paln.
5	Is the sub-project expected to result in soil erosion?	Yes	✓				Little soil erosion is expected during construction works.

6	Is the sub project expected to create borrow pits for construction material?	No					No, borrow pits will require.
7	Will the subproject result in potential soil or water contamination (e.g., from oil, grease and fuel from equipment yards)?	Yes		✓			soil and water contamination expected during the construction phase. Strict plan or guidelines for the construction phase are suggested.
8	Will the subproject involve the storage, handling, or transport of hazardous substances?	No					The subproject will not involve the storage, handling, or transport of hazardous substances.
9	Will the sub project disturb the ambient air quality and/or increase the level of harmful air emissions (due to generation of dust from construction activity, vehicular/ machinery exhaust emissions, etc.)	Yes	✓				Little vehicular and dust emission is expected due to construction work.
10	Will the subproject increase ambient noise levels?	Yes	✓				Little noise pollution is expected due to construction machinery etc. as the proposed project areas is approximately 3 KM away from the urban/city.
11	Are there any protected areas on or around the locations which could be affected by the subproject?	No					No protected areas observed nearby the subproject.
12	Will there be any adverse impact on the flora due to subproject activities?	Yes	✓				Only scattered grosses, shrubs etc removing is anticipated near the project area.
13	Will there be any adverse impact on the fauna due to subproject activities?	No					Fauna will not impact by the subproject.

C: Social Issues

Sr. No	Issues	No/Yes	Risk Level				Remarks/Mitigation Measures
			Low	Moderate	Substantial	High	
1	Will the subproject activities involve a significant inflow of labor?	Yes		✓			Unskilled Local labor will be engaged as for the possibility.
2	Will there be any social conflicts arising from the interaction of laborers with locals, particularly by the induction of outside labor and establishment of construction camps (if any)?	No					No outside labor camps are expected community coordination will be ensured if labor camp has proposed.
3	Will the activities supported by the project anticipate the occurrence of child labor, forced labor, or bonded labor?	No					Contractor will comply with labor laws and strict monitoring is suggested during the construction phase.
4	Will the subproject activities pose risks to nearby sensitive receptors (mosque, temple, church, graveyard, hospital, school/college/university), if any?	No					No sensitive receptors identified near the proposed project area and Safety barrios will be installed as per the need.
5	Will the sub project pose occupational health and safety risks?	Yes	✓				Contractor will provide PPE safety training and first aid and other occupational health and safety related googles and trainings.
6	Will the sub project pose community health and safety risks?	Yes	✓				Little community health & safety risks expected if proper safety ribbons and other protocols not implemented.
7	Risk of increase in traffic and pedestrian safety due to the construction vehicle movement, particularly near sensitive receptors.	Yes	✓				Traffic incidents are expected. The contractor should prepare proper TMP and its implementation.
8	Will there be land acquisition? If yes, is the site for land acquisition and ownership status and current usage of land to be acquired known?	No					All work in existing rows.
9	Will there be a loss of shelter and residential land due to the land acquisition or clearance of the existing site?	No					None as work is within existing row.
10	Are any informal settlers or flood-affected persons present on the subproject site where	No					No informal settlers or flood-affected persons present at the site.

	construction and rehabilitation activities will be carried out?						
11	Has there been any Anti-Encroachment Drive to forcefully evict/move people at the site where the works are planned to be carried out?	No					The subproject site is free from encroachment.
12	Will there be a loss of agricultural land, crops, trees, and fixed assets due to land acquisition?	No					This site has no land acquisition agricultural land.
13	Will people lose access to natural resources, communal facilities and services due to involuntary land use restrictions or access to legally designated parks/protected areas?	No					No Access will be maintained during activity.
14	Any estimate of the likely number of persons affected by the subproject? If yes, approximately how many? Are any of them falling into disadvantaged/vulnerable groups such as Female/child headed households, Internally Displaced Persons (IDPs), Refugees, Ethnic and religious minorities, Persons with disabilities, Transgender communities, Senior citizens, or economically marginalized groups)?	No					Each and every community is totally safe no one is effected.
15	Have there been any past security-related issues at the subproject site?	No					No area is safe
16	Has stakeholder engagement taken place with relevant stakeholders (Provincial/District level Government Departments/Communities/NGOs/CSOs) for the subproject?	Yes	✓				Initial consultations carried out both with community and administration further engagement will continue during implementation.
17	Is the subproject being implemented in an area with natural hazard risk? (e.g., floods, earthquakes, cyclones etc.).	No					No significant hazard risks identified except flood; the subproject is located to flood prone areas.

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 by the subproject 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?	Yes		✓			Indigenous people are present in the subproject area.
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: _____ **Designation:** _____

Signature_____Date_____

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

Signature_____ Date_____

Annexure-J

List of Participant in consultative meeting with District Administration

S. No	Name	Department	Designation
1	Razaq Khan	Administrative /Revenue Department	Deputy Commissioner Kachhi
2	Syed Ali Shah	Administrative /Revenue Department	Assistant Commissioner Bhag
3	Ghulam Rasool	Revenue Department	Tehsildar Bhag
4	Khan Muhammad	Revenue Department	Patwari
5	Shakoor Kakar	PIU Facilitator	Social Safeguard Specialist
6	Naqeeb Ullah Kakar	PIU Facilitator	Social Safeguard Specialist
7	Muhammad Ahsan	PIU Facilitator	Environment and Gender Team Lead
8	Qaisara Khan	PIU Facilitator	Female Community Resource Person

ANNEXURE-K

Gender Action Plan (GAP) for BWSPIP 1st Draft

Gender Action Plan-GAP

1. Introduction

The 2022 floods in Baluchistan disproportionately affected women and girls due to pre-existing gender inequalities, socioeconomic vulnerabilities, and limited access to resources. The BWSPIP seek to address these challenges through**,** 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

• 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	Responsibili Ty	Timeline
Institutional Strengthenin g & Participation	• Ensure at least 40% women's representation in community-level FGDs and Consultations. • Provide gender-sensitivity, SEA/SH, and safeguards sessions to community • Engage local women's	• 40% women in DRMCs. • of personnel trained (gender-disaggregated) . • #of women-form groups	• 40% women representation. • 100% PDSC staff and contractors trained.	PIU,PDSC Gender/Soci al Specialist	Throughout project

Strategic Area	Activities	Indicators	Targets	Responsibili Ty	Timeline
	organizations for community outreach. •Provide gender-sensitivity, SEA/SH, and safeguards sessions to PDSC and contractor staff	and engaged in activities.			
Gender-Responsive Infrastructure and Services	• Integrate women-friendly design (Footbridges and/or passages in strategic locations of the irrigation system accessibility) in flood-resilient sub-project reconstruction. • Prioritize pregnant/lactating women and women with disabilities during service reconstruction-restoration.	• # of facilities with gender-responsive design. • % women beneficiaries.	• 100% facilities compliant. • 50% women beneficiaries.	PDSC and Contractor Infrastructure Specialist	Years 1–3
Disaster Risk Reduction & Climate Resilience	• Include women in early warning dissemination and community preparedness planning. • Conduct disaster preparedness awareness sessions targeting women and girls. • Promote women's engagement in climate-resilient water and land management.	• % women participating in DRR activities. • # women trained.	• 30% women participation. • Annual awareness sessions conducted.	PIU,PDSC 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	• Establish women-friendly GRM access points,	• **% of project communities informed**	• 40% women participation. • Monthly and	PIU,PDSC Social and Gender team	Throughout project

Strategic Area	Activities	Indicators	Targets	Responsibili Ty	Timeline
Redress Mechanism	including female focal persons. •Conduct GRM awareness sessions, including women-only sessions.	**about the GRM**, disaggregated by gender • **Number of GRM awareness sessions conducted,** including women-only sessions	Quarterly awareness sessions conducted.		
Monitoring and Reporting	● Monthly ESMP Monitoring Reports ● Quarterly Social Safeguards Reports ● GAP Progress Reports ● GRM records and community feedback	# of reports submitted; completeness source	Monitoring data will be sex-disaggregated and used to adapt implementation as needed.	PIU Gender Specialist will oversee compliance, with third-party monitoring where required.	Throughout project

5. 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

6. Budget Allocation

A minimum of 1% budget 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.

7. Conclusion

This Gender Action Plan provides a comprehensive, World Bank–compliant framework to ensure that BWSPIP 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-L

CONSULTATION MEETINGS WITH COMMITTEE



C758690

Rupees 50 ۵۰ روپیہ

محاہدہ مابین مالکان اراضی و منصوبہ

مربوط پروگرام برائے بلوچستان میں پانی کی حفاظت اور پیداواری صلاحیت میں بہتری

(BWSPIP)

ہم کسان انجمن ممبران و مالکان ارضیات نالہ ---------- باہمی رضامندی سے اقرار کرتے ہیں کہ:

۱)۔ہم نے پروجیکٹ کے تحت ہونے والے ترقیاتی کاموں کا بغور جائیزہ لیا ہے اور ہمیں ان کاموں پر کسی قسم کا کوئی اعتراض نہیں ہے۔

۲)پروجیکٹ کے مین نالہ اور شاخ جہاں سے گزر رہے ہیں اس پر ہم کو کسی قسم کا کوئی اعتراض نہیں ہے۔

۳)۔ پروجیکٹ کے مین نالہ اور شاخ کی تمام زمین کسان انجمن کی ملکیت ہے۔ اس کی تفصیل منسلک ہے۔

۴)اگر نالہ کی تعمیر کیلئے کوئی مزید زمین درکار ہوگی تو جس انجمن ممبر کی اراضی سے گزر رہا ہے اسکے لیے درکار زمین کے بارے میں وہ ممبر اب یا آیندہ کسی قسم کے معاوضے کا مطالبہ نہیں کریگا اور زمین منصوبہ کی تعمیر کیلئے بلا معاوضہ دے دی جائیگی۔

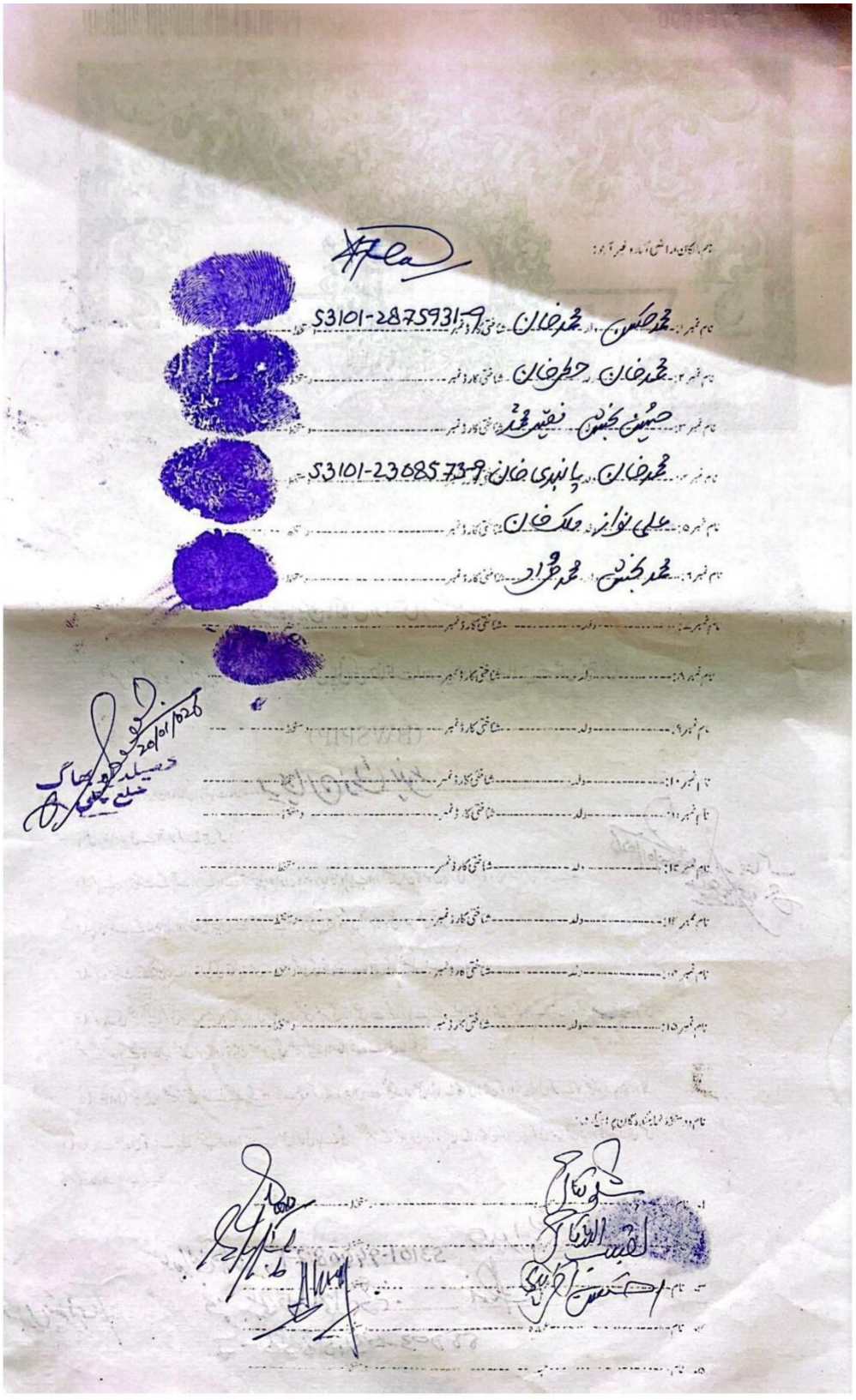
۵)(ME) منیریل انجینیئر مٹی اٹھانے کیلئے جگہ کا انتخاب خود کریگا اور جہاں سے ٹھیکدار مٹی اٹھائے گا اسی زمین کو واپس لیول کرنے کا ٹھیکدار پابند ہوگا۔

۶) جہاں سے نالیوں کو بنانے کیلئے منتخب کردہ زمین سے مٹی اٹھائی جائے گی، تنظیم کے ممبران اور زمین کے مالکان کو اس پر کوئی اعتراض نہ ہوگا اور نہ ہی کسی قسم کا معاوضہ طلب کرینگے

نام چیئرمین کسان انجمن: عبدالغنی جان شناختی کارڈ نمبر 53101-9440812-3 دستخط

نام چیئرمین کسان انجمن دستخط

88303-0345888-7



...ان / ریجنل کنوینر) اجلاس میں حاضر ممبران کی تفصیل

نمبر شمار	نام ممبر مع ولدیت	قومی شناختی کارڈ نمبر	دستخط
1	محمد علی ولد محمد عالم	53303-0780171-9	
2	رئیس میاں خان ولد حمزہ خان	53101-6452982-3	
3	برکت علی ولد گل محمد	53402-1589921-5	
4	محمد طاہر ولد طارق حسین	53101-2685735-3.5	
5	ابوبکر (میر زبیر) ولد سردار جلال خان	53101-8560426-3	
6	حبیب علی ولد حاجی آلہ ڈنہ	53303-0803469-9	
7	باچا خان ولد دین محمد	53303-7803469	
8	گل بہار ولد محمد زمان	53303-6024518-5	
9	سجاد حسین ولد طارق حسین	43404-0398623-9	
10	فاروق احمد ولد نذیر محمد	53101-4922340-1	
11	فضل حق ولد رسول بخش	53303-0778121	
12	جمیل احمد ولد محمد قاسم		
13	مشرف خان ولد محمد قاسم	53101-5258371-5	
14	حاجی عبداللہ ولد حاجی خان	53101-4168235-7	
15	فدا حسین ولد عبدالحق	53101-9553279	
16	حضور بخش ولد لعل خان	53302-9141317-9	
17	رسول بخش ولد لعل جان	53101-6076564-5	

دستخط / نشان انگوٹھا صدر / چیئرمین تنظیم: ابوبکر (میر زبیر موسیٰ خیلی)

تصدیق: دستخط / نشان انگوٹھا جنرل سیکرٹری تنظیم: محبوب علی

1- 53202-0951806-5

دستخط / نشان انگوٹھا سوشل آرگنائزر:

54400-8582848-7

تنظیم کے اراکین کی فہرست

نمبر شمار	نام ابمعہ ولدیت	عہدہ	شناختی کارڈ نمبر	رابطہ نمبر	مذہب	زمین (رقبہ ایکڑ)
1	ابوبکر (پیر زبیر)	صدر	53101-8560426-3	03323380206	اسلام	5000.
2	محبوب علی ولد حاجی الحرمین	جنرل سیکرٹری	53303-6291346-9	03338376548	اسلام	530
3	رسول بخش ولد لعل جان	خزانچی	53101-6076586-5	0334-1236320	اسلام	200
4	باجی خان ولد دین محمد	ممبر	53303-0780346-9	0333-3594899	اسلام	230
5	گل بہادر ولد	ممبر	6331-8187094.		اسلام	240
6	محمد زمان بھجی وحسین ولد لعل شیر	ممبر	43404-0398623-9	03339146742	اسلام	530.
7	فاروق احمد ولد نذیر احمد	ممبر	53101-4922340-1	0313-8897681	اسلام	158
8	فضل حق ولد رسول بخش	ممبر	53303-0778271-5	03342-682383	اسلام	130
9	سرفراز خان ولد محمد خان	ممبر	53101-5258375-5	0330376036	اسلام	120.
10	فرید حسین ولد عبدالحق	ممبر	58101-9553227-9	0335-81990-66	اسلام	210.

C758692

Rupees 50 ۵۰ روپیہ

دیہات کان دار اضی آباد و غیر آباد:

نام نمبر۱:

نام نمبر۲:

0343-8101070.

نام نمبر۳: میر احمد وفری ولد شناختی کارڈ نمبر 53101-24101827 دستخط

نام نمبر۵: میر دوست محمد شناختی کارڈ نمبر دستخط

نام نمبر۶: میر ذوبیر خان وفری شناختی کارڈ نمبر 53101-8576476 دستخط

نام نمبر۷: ولد سردار علال خان شناختی کارڈ نمبر دستخط

نام نمبر۸: یسین پیارا ولد شناختی کارڈ نمبر 53101-6952782-8 دستخط

نام نمبر۹: یسین محمد خان شناختی کارڈ نمبر دستخط

نام نمبر۱۰: غلام یاسین ولد شناختی کارڈ نمبر 53101-2587731 دستخط

نام نمبر۱۱: غلام دستخط

نام نمبر۱۲: حاجی ولد شناختی کارڈ نمبر 53101394285 دستخط

نام نمبر۱۳: عبدالحکیم ولد شناختی کارڈ نمبر دستخط

نام نمبر۱۴: باچی خان ولد شناختی کارڈ نمبر 53303-7803469

نام نمبر۱۵: ولد شناختی کارڈ نمبر 53302-9141317

حضرت بخش ولد

لال خان 53101-6076564-5

محمد بخش ولد محمد مراد

نام دستخط نمائندہ گان پراجیکٹ

حضرت بخش ولد

خلع بھاگ

محمد بخش

۱۔ نام عہدہ دستخط

۲۔ نام عہدہ دستخط

۳۔ نام عہدہ دستخط

۴۔ نام عہدہ دستخط

۵۔ نام عہدہ دستخط

مشاورتی اجلاس

تاریخ: 19 جنوری 2026 مقام: نیو ریحانہ زئی گورنمنٹ بوائز ہائی سکول 10 بجے دن جلال خان

آبجنڈا:-

۱:--- جلال خان ایکیم کے FO کی تشکیل نو۔

۲:--- VLA کے بارے میں ورلڈ بنک کی پالیسی کے بارے میں بات اور مثال۔

۳:--- (Cadastral record) کے بارے میں بات۔

۴:--- جلال خان ایکیم کے مین اسٹرکچرز (Main structures) کے بارے معلومات

۵:---

تفصیل:

آج بتاریخ 19 جنوری 2026 کو جلال خان ایکیم کے زمینداروں اور زمین مالکان کا (FO) کمیٹی ایجنسی تنظیم کی تشکیل نو منتظم کے حوالے کیا زمینداروں نے (FO) کے ممبران کو اپنا لیڈر منتخب کیا پروجیکٹ کے بارے میں جلال خان ایکیم کے (main structure) کے بارے میں زمینداروں کو آگاہ کیا گیا اور پروجیکٹ کے پیم نے ورلڈ بنک کی پالیسی کے بارے میں تفصیل سے بتایا کہ جو اسٹرکچر بنے گا جن غریب زمینداروں کی زمین پر زمینداروں نے اسٹرکچرز کیلئے زمین معاف دینا ہوگا اور جتنا زمین درکار ہوگا اسٹرکچر پر جیسے کنال میں یا کوٹی اور اسٹرکچر پر زمینداروں نے کتنی فیصد معاوضہ کا مطالبہ پیش کرنا ہوگا اور باقاعدہ طور پر زمینداروں سے سائن پیپر پر حلفیہ لیا اور تحصیلدار سے Attested کروایا گیا اور موقع پر تحصیلدار اور پٹواری بھی موجود

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یکساں اور پٹواری نے (Undisturbed record) کے مطابق ہے زمینداروں
کی نشاندہی کی جن میں زمینداروں کے زمین پر ریشمی کیڑے بنائے جا رہے ہیں
اُن میں زمینداروں سے معائنہ پیپر پر دستخط لیئے اور بعد میں زمیندار نمبر ۱
کے چیئرمین عبدالغنی جان نے علاقے کے بارے میں بات کی اور کہا کہ ہمارے
علاقے میں سب سے زیادہ ریشم کا کیڑا پالا جاتا ہے اور دوسرا
بڑا فیصلہ یہ ہے اور ہمارا جو ٹیکنیک پر (Weir Structure) منظور ہوا
ہے اور بنایا جا رہا ہے ہمارے زمینداروں کا بہت بڑا علاقہ ہے کہ
نارمی ندی اور پوران ندی دونوں ریگ سا ہو آتا ہے میں ہمارے آباد زمینوں
میں آباد کرنے کے چانسز نہیں کر تا تھا اب ورلڈ بنک اپریشن کے ذریعے ہمارا
کام ہوں میں ایک بڑا ریشمی کیڑے اور نالہ جو ڈیزائن کیا گیا ہے ریشم کے اللہ
ایسی کیڑے کی وجہ سے ہمارے سارے زمینوں کو آباد کر سکتے ہیں
ہم زمینداران اور ۔۔۔ کے تمام عہدیداران دل سے شکر اور ہم وعدہ کرتے ہے
کہ کریں گے اور ہم زمینداران ہر قسم کے تعاون کیلئے تیار ہے۔۔۔۔

تصدیق کنندہ:

53101-9440812-1.

۱: ایل جی آر سی ممبر کسان انجن: نام: عبدالغنی ولد شاہ میر دستخط: عبدالغنی

۲: ایل جی آر سی ممبر کسان انجن: نام: حاجی عزیز اللہ دستخط:

53101-0780126-1

۳: کمیٹی ممبرز

۱: نام: اختیار خان ولد رحمت اللہ دستخط:

53101-2147610-9.

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۳: نام: حاجی میر ولد محمد عمر خان ۔۔۔ دستخط: حاجی میر علی خان
53101-3961519-3

۴: نام: حاجی محمد نعیم ولد حاجی محمد اسلم خان دستخط:
53303-0782082-5

۵: نام: محمد اسرار خان ولد محمد عمر ۔۔۔ دستخط:
53101-9660954-5

۶: نام: طفیل اللہ خان ولد محمد عمر ۔۔۔ دستخط: ضلع خان
53101-6181074-7

۷: نام: خلیفہ خان ولد (سید اللہ خان) دستخط:
53306-6080828-3

۸: پروجیکٹ سٹاف:

۹: نام: شوکت ولد غفور احمد زئی ۔۔۔ دستخط: 56202-0951804-1

۱۰: نام: فضل اللہ کاکڑ ولد حاجی محمد یار ۔۔۔ دستخط:

۱۱: نام: حکیم خان آفریدی ۔۔۔ دستخط:

۱۲: نام: ۔۔۔ دستخط:

۱۳: نام: ۔۔۔ دستخط:

۱۴: نام: ۔۔۔ دستخط:

۱۵: نام: ۔۔۔ دستخط:

۱۶: نام: ۔۔۔ دستخط:

Scanned with CamScanner

List of Participants of different meetings. Annexure: M

List of FO Formation at New Rehnzai Village

Date	Name of Participants
24/01/2026	Abdul Nabi Jan s/o Shahmeer Khan
	Haji Aziz ullah s/o Mehrab Khan
	Takari Muhd Hassan S/o Muhd Khan
	Haji Meeral Khan S/ o Muhd Khan
	Haji Muhd Wazir S/o Mehrab u din
	Mohammad Saleem Khan s/o Meeral Khan
	Imtiaz Ahmed S/o Rehmat Ullah
	Nawab Khan S/0 Dur Muhd
	Ehsan Ali S/o Shair Muhd Khan
	Zafar ullah s/o Muhd Hayat
	Khalifa Khan S/o Shakoor Ullah Khan

List of FO Formation at Rehanzai Kona Jalal Khan village

Date & Location	Name of Participants
22/01/2026	Abu Bakar S/o Sardar Jalal Khan
	Saeed Khan Naib Tehsildar
	Mahboob Ali S/o Haji Ala dina
	Rasool Bukhsh S/o Lal Jan
	Baji Khan S/o Din MUhd
	Gul Bahar S/o Muhd Zaman
	Sajad Hussain S/o Tariq Hussain
	Farooq Ahmed S/0 Nazeer Ahmed
	Sorab Khan S/0 Sorab Muhd Qasim
	Nadeem Hussain S/o Abul Hai
	Muhd Ali S/o Muhd Alam
	Raees Mia Khan S/o Hamza Khan

Date	S. No	Name of Participants
19/01/2026	1	Abdul Nabi Jan s/o Shahmeer Khan
	2	Haji Aziz ullah s/o Mehrab Khan
	3	Takari Muhd Hassan S/o Muhd Khan
	4	Haji Meeral Khan S/ o Muhd Khan
	5	Haji Muhd Wazir S/o Mehrab u din
	6	Mohammad Saleem Khan s/o Meeral Khan
	7	Imtiaz Ahmed S/o Rehmat Ullah
	8	Nawab Khan S/0 Dur Muhd
	9	Ehsan Ali S/o Shair Muhd Khan
	10	Zafar ullah s/o Muhd Hayat
	11	Mir Amjid s/o Jalal Khan
	12	Mir Zubair s/o Sardar Jalal Khan
	13	Raees Khan s/o Hamza Khan
	14	Ghulam Abbas S/o Gul Bahar
	15	Khadim Hussain s/o Muhd Sharif
	16	Baji Khan S/o Din Muhd
	17	Hazoor Bukhsh s/o Lal Jan
	18	Lal Jan s/o Hazoor Bakhsh
	19	Khalifa Khan S/o Shakoor Ullah Khan
	20	Sardar Zubair Khan S/o Sardar Jalal Khan
	21	Shoaib Khan S/o Sana Ullah
	22	Sohail Ahmed S/o Muhd Rafi
	23	Babo Saifullah S/o Mehrab u din
	24	Siraj Ahmed S/o Haji Meeral Khan

Men Consultation New Rehanzai

List of Community Consultation Meetings Rehnzai Kona Village

Date	S. No	Name of Participants
20/01/2026	1	Abu Bakar S/o Sardar Jalal Khan
	2	Saeed Khan Naib Tehsildar
	3	Mahboob Ali S/o Haji Ala dina
	4	Imran Baloch S/o Khan Muhd
	5	Rasool Bukhsh S/o Lal Jan
	6	Haji Khan s/o Meer Ahmed
	7	Baji Khan S/o Din Muhd
	8	Gul Bahar S/o Muhd Zaman
	9	Haji Muhd Wazir S/o Mehrab u din
	10	Haji Meeral Khan S/o Muhd Umar khan
	11	Mohammad Saleem Khan s/o Meeral Khan
	12	Farooq Ahmed S/0 Nazeer Ahmed
	13	Muhd Bakhsh s/o Haji Hassan
	14	Abdul Nabi S/o Shamsheer khan
	15	Mehboob Ali s/o Ala Dina
	16	Muhd Hussain S/o Muhd Hassan
	17	Muhd Khan S/o Malak Haji Alam
	18	Hussain Bakhsh S/o Lal Khan
	19	Muhd Bakhsh s/o Muhd Hussain
	20	Sorab Khan S/0 Sorab Muhd Qasim
	21	Nadeem Hussain S/o Abul Hai
	22	Muhd Ali S/o Muhd Alam
	23	Raees Mia Khan S/o Hamza Khan
	24	Barkat Ali S/o Gul Muhd
	25	Muhd Tahir S/o Tariq Hussain
	26	Abdul Wahab S/o Ahmed Khan
	27	Bakhtiyar Ahmed S/o Muhd Qasim
	28	Abdullah S/o Haji Khan
	29	Hazoor Bakhsh S/o Lal Jan
	30	Rasool Bakhsh S/o Lal Jan

List of Women Consultations New Rehanzai Village

Date	Name of Participants
23/01/2026	Hamida
	Khatoon Bibi

	Robina Bibi
	Ayesha Bibi
	Shazia Khatoon
	Farzana Bibi
	Naseem Akhtar
	Parveen Bibi
	Rubina Bibi
	Saima Bibi
	Hameeda Bibi

List of Women Consultations Rehanzai , Jamra and Jalal Khn Village

Date	**Name of Participants**
25/01/2026	Zubaida Bibi
	Sobia Bibi
	Kainat Bibi
	Nargis Bibi
	Asma Bibi
	Gulshan Bibi
	Mehreen Bibi
	Samina Bibi
	Zulekha Bibi
	Shabana Bibi
	Rukhsana Bibi

Formation of Women Development Group New Rehanzai

Date	S. No	Name of Participants
19/01/2026	1	Hamida
	2	Khatoon Bibi
	3	Robina Bibi
	4	Ayesha Bibi
	5	Parveen Bibi
	6	Rukhsana Bibi
	7	Yasmeen Bibi
	8	Khadija Bibi
	9	Amina Bibi
	10	Fatima Bibi
	11	Jamila Bibi

	12	Zulekha Bibi
	13	Shazia Khatoon
	14	Farzana Bibi
	15	Naseem Akhtar
	16	Parveen Bibi
	17	Rubina Bibi
	18	Saima Bibi
	19	Hameeda Bibi
	20	Shahnaz Bibi

Formation of Women Development Groups at Rehanzai, Jamra and Jalal Khan village

Date	S. No	Name of Participants
20/01/2026	1	Zubaida Bibi
	2	Sobia Bibi
	3	Kainat Bibi
	4	Nargis Bibi
	5	Bibi Shahina
	6	Shazia Bibi
	7	Gul Bano
	8	Naseema Bibi
	9	Zarina Bibi
	10	Sakina Bibi
	11	Asma Bibi
	12	Gulshan Bibi
	13	Mehreen Bibi
	14	Samina Bibi
	15	Zulekha Bibi
	16	Shabana Bibi
	17	Rukhsana Bibi
	18	Zubaida Bibi

ANNEXURE-M

Summary of VLD Agreement

Three steps adopted for the acquired lands voluntarily from the farming communities through VLD process. First step was Walk Through Surveys along with the channels to identify and scanned the affected lands at field level. The second step was meeting with representatives of the Revenue Departments to scan and verify these identified lands through the Cadastral Record. Similarly, third step was adopted for signing of agreements with the land owners. These were done in consultations meeting in presence of concerned office bearers of Farmer Organizations (FO)s. In this regard, 60.8 acres of land has been acquired from the farmers for construction of Flood Dispersal structure. Total 14 farmers have donated their 60.8 acres of lands for the sub-project of BWSPIP.

Record of signed agreement


C758690

Rupees 50 ۵۰ روپیہ

محاہدہ مابین مالکان اراضی و منصوبہ

مربوط پروگرام برائے بلوچستان میں پانی کی حفاظت اور پیداواری صلاحیت میں بہتری

(BWSPIP)

ہم کسان انجمن ممبران و مالکان اراضیات نالہ ---------- ہیں رضامندی سے اقرار کرتے ہیں کہ:

۱)۔ہم نے پروجیکٹ کے تحت ہونے والے ترقیاتی کاموں کا بغور جائیزہ لیا ہے اور ہمیں ان کاموں پر کسی قسم کا کوئی اعتراض نہیں ہے۔

۲)۔یہ وجیکٹ کے مین نالہ اور شاخ جہاں سے گزر رہے ہیں اس پر ہم کو کسی قسم کا کوئی اعتراض نہیں ہے۔

۳)۔ یہ پروجیکٹ کے مین نالہ اور شاخ کی تمام زمین کسان انجمن کی ملکیت ہے۔ اس کی تفصیل منسلک ہے۔

۴)اگر نالہ کی تعمیر کیلئے کوئی مزید زمین درکار ہوگی تو جس انجمن ممبر کی اراضی سے گزر رہا ہے اسکے لیے درکار زمین کے بارے میں وہ ممبر اب یا آیندہ، کسی قسم کے معاوضے کا مطالبہ نہیں کریگا اور زمین منصوبہ کی تعمیر کیلئے بلا معاوضہ دے دی جائیگی۔

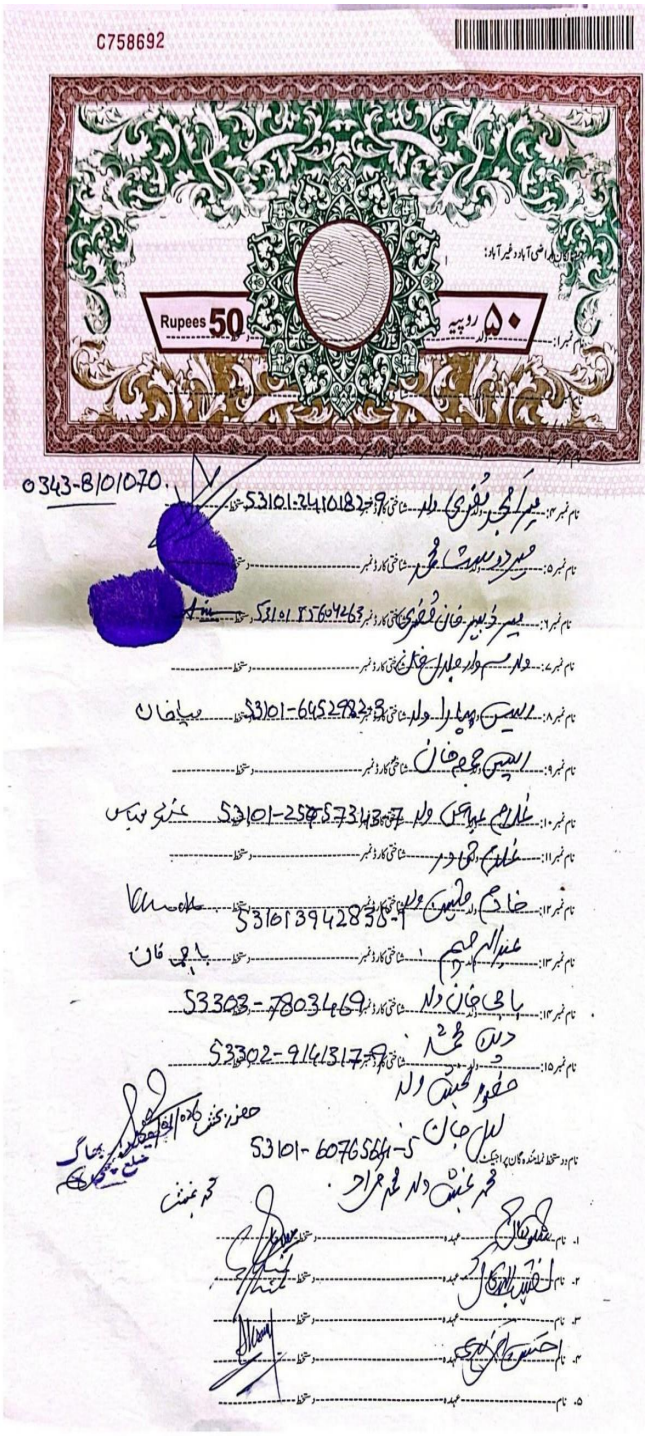
۵)(ME) سٹیریل، انجنیئر مٹی اٹھانے کیلئے جگہ کا انتخاب خود کریگا اور جہاں سے ٹھیکیدار مٹی اٹھائے گا اسی زمین کو واپس لیول کرنے کا ٹھیکیدار پابند ہوگا۔

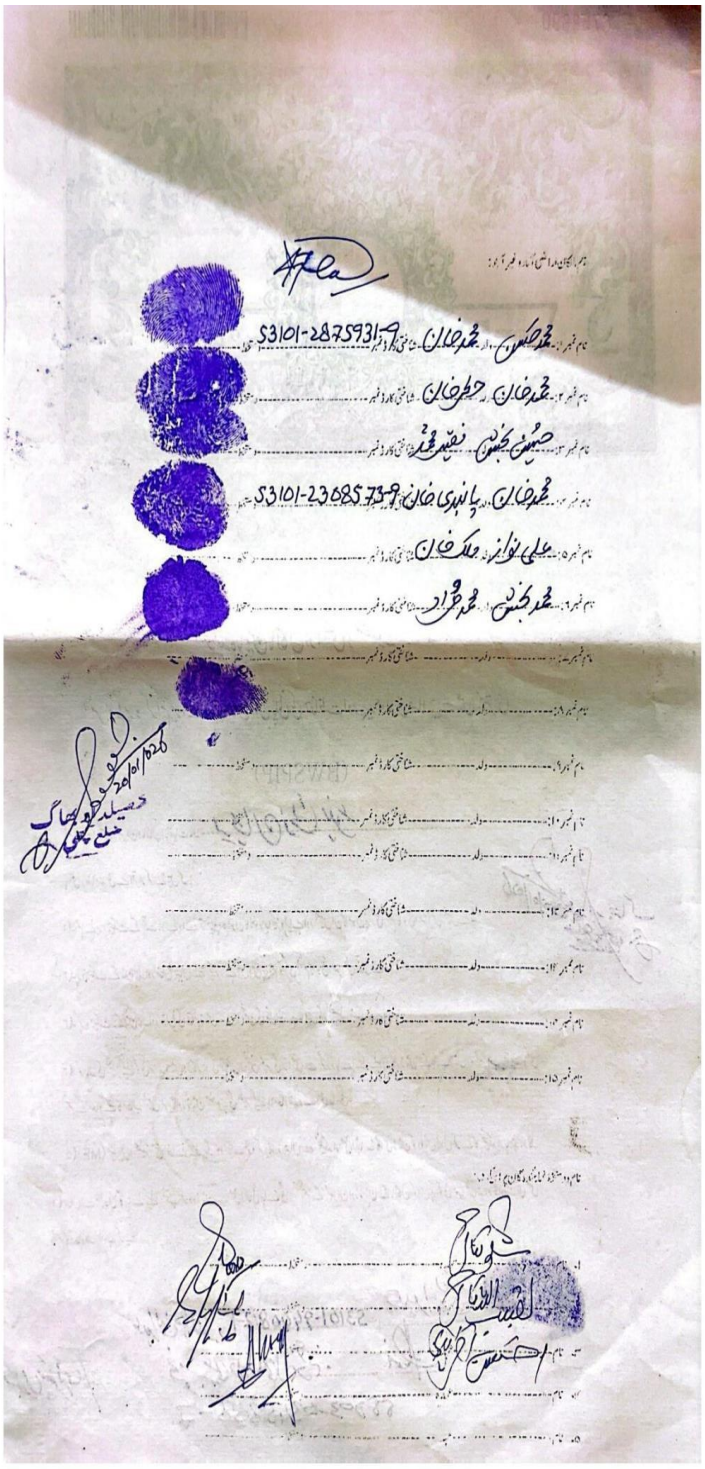
۶) جہاں سے نالیوں کو بنانے کیلئے منتخب کردہ زمین سے مٹی اٹھائی جائے گی، تنظیم کے ممبران اور زمین کے مالکان کو اس پر کوئی اعتراض نہ ہوگا اور نہ ہی کسی قسم کا معاوضہ طلب کریگے

نام چیرمین کسان انجمن: عبدالغنی جان ولد [illegible] شناختی کارڈ نمبر 53101-9440812-3 دستخط

نام سیکرٹری/چیرمین کسان انجمن [illegible] دستخط

88303-0345888-7


C758692
Rupees 50
۵۰ روپے
0343-8101070



Jalal Khan Disposal Flood Scheme & Weir

Sr. No	Name of Ownership Land	Total Land	Occupant of VLD	%
1	Mir Amjad Muqam	230 Acres	4.5	1.95 Acres
2	Mir Zubir Khan.	90	2.9	2.77 Acres
3	Rakees Rajput	120	3.6	3.00 Acres
4	Ghulam Abbas.	95	4.59	4.70 Acres
5	Khadim Hussain	87	9.5	10.9 Acres
6	Baji Khan.	250	7.85	3.12 Acres
7	Nazar Baksh.	75	3.91	5.21 Acres
8	Cal jan.	65	2.51	3.86 Acres
9	Mahemmad Baksh	120	3.92	3.26 Acres
10	Abdul Nabi	97.5	6.50	6.60 Acres
11	Mahbob Ali	25	2.31	9.20 Acres
12	Mohd Hussain	61.0	2.00	3.27 Acres
13	Mahmud Khan	55.5	4.5	8.10 Acres
14	Hussain Baksh	20.9	2.09	10.10 Acres
15		1391.9 Acres	60.68 TT Acres	
16				

Name: Shakoor Kalhoro Designation: Social Specialist

Naqeeb Kalhoro.

ANNEXURE-N

Workers Code of Conduct (To be signed by all workers)

1. All contractors / Third Parties and Firms are also required to translate this 'Workers Code of Conduct' in Urdu / Balochi/Brahui etc. and get it signed by all their workers engaged under project and to submit signed copy of this in respect of every worker to the project within one month of the workers' engagement.

2. The management of BWSPIP will also get the 'Workers' Code of Conduct' signed by all project workers (direct workers, government staff, and community workers).

3. The "Workers' Code of Conduct' is as follows:

I ……(Name of the Worker)……solemnly declare that in the wider interest of the Project I will abide by the following:

I will perform my assigned duties diligently and to cooperate with and support the project management in the implementation of this LMP.

I will comply with the prescribed health and safety measures and take reasonable care of my safety and health, and that of other persons who may be affected by my acts of omissions.

It is my responsibility to immediately report any situation presenting a risk to my safety and that of other persons at the workplace to the contractor and the project management.

I will participate in orientation and training sessions on OSH, emergency preparedness and awareness campaigns.

Along with other workers, I shall also participate in collective actions including election of workers' representatives and in workers' participation with the management during execution of the project activities.

I shall not indulge in any inhuman practice including sexual harassment, GBV, bullying, unethical behavior and immoral activities at workplace, place of living and during interaction with local population, school staff and students.

In case of any untoward / awkward incident / bullying / victimization/ maltreatment by local people at workplace and the place of living, I shall report immediately to the project's GRM.

Finally, I understand that peace and harmony at work place is closely linked to workers' respect for co-workers, tolerance and accepting socio-cultural values and traditions of other workers and the host community.

Signature of the worker Date:_____

ANNEXURE-O

Detailed Cost Working Sheet: Anticipated ESMP Implementation Budget

Project: BWSPIP: Jalal Khan Flood Dispersal/Weir

Currency: PKR | **Peak Workforce Basis:** 250 workers | **Active Works:** 12 months

Component 1: C-ESMP Preparation & Implementation: PKR 800,000

Activity	Basis	PKR
C-ESMP document preparation	Lump sum: drafting, review, PDSC approval	150,000
Pollution Prevention Plans (air/noise/waste/sanitary)	Lump sum: 4 plans	100,000
Traffic Management Plan	Lump sum with signage layout	80,000
EHS Training Plan	Lump sum	50,000
Camp Health & Sanitation Plan	Lump sum	50,000
Periodic C-ESMP updates (bi-annual × 2)	2 events × PKR 40,000	80,000
Printing/binding/distribution (30 copies)	30 copies × PKR 1,500	45,000
Internal ESMP compliance audits (quarterly × 4)	4 audits × PKR 30,000	120,000
EHS site signage boards (15 multilingual boards)	15 × PKR 3,000	45,000
Site environmental risk register	Lump sum	30,000
Sub-total		**800,000**

Component 1: C-ESMP Preparation & Implementation: PKR 800,000

Activity	Basis	PKR
C-ESMP document preparation	Lump sum: drafting, review, PDSC approval	150,000
Pollution Prevention Plans (air/noise/waste/sanitary)	Lump sum: 4 plans	100,000
Traffic Management Plan	Lump sum with signage layout	80,000

EHS Training Plan	Lump sum	50,000
Camp Health & Sanitation Plan	Lump sum	50,000
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Printing/binding/distribution (30 copies)	30 copies × PKR 1,500	45,000
Internal ESMP compliance audits (quarterly × 4)	4 audits × PKR 30,000	120,000
EHS site signage boards (15 multilingual boards)	15 × PKR 3,000	45,000
Site environmental risk register	Lump sum	30,000
Sub-total		**750,000**

Component 2: Contractor HSP & Emergency Response: PKR 300,000

Activity	Basis	PKR
Detailed OHS Plan preparation	Lump sum	80,000
Emergency Response Plan drafting & approval	Lump sum	50,000
Emergency drills/mock exercises (bi-annual × 2)	2 × PKR 25,000	50,000
OHS/hazard signage boards at work zones	20 boards × PKR 2,500	50,000
Incident registers, logbooks, reporting forms	5 sets × PKR 4,000	20,000
Incident investigation protocol	Lump sum	30,000
Annual HSP review and update	1 event	20,000
Sub-total		**300,000**

Component 3: ESMP Staffing: PKR 3,200,000

Position	Man-Months	Market Rate/Month (PKR)	Total (PKR)
Environmental Officer (field-posted, experienced)	12	110,000	1,320,000
Health & Safety Officer / Paramedic	12	90,000	1,080,000
CLO / Gender Mobilizer (part-time, peak period)	10	80,000	800,000

Sub-total	**34 man-months**		**3,200,000**

Component 4: Baseline & Periodic Environmental Monitoring: PKR 812,000

Parameter / Activity	Locations	Events	Unit Cost (PKR)	Total (PKR)
Ambient air (PM10, PM2.5, SO_2, NO_x, CO: 5 params)	2	4/yr	10,000/param	400,000
Ambient noise (Leq day/night, peak)	2	4/yr	3,000/event	24,000
Water quality (complete analysis per ISO 17025 lab)	2	2/yr	14,000/event	56,000
Lab mobilization/demobilization (quarterly)	—	4	12,000	48,000
Quarterly monitoring reports (4 reports)	—	4	5,000	20,000
Additional field measurements & miscellaneous	—	—	Lump sum	264,000
Sub-total				**812,000**

Component 5: PPE & HSE Equipment: PKR 850,000

PPE Item	Workers	Unit Cost (PKR)	Total (PKR)
Safety helmets: all 250 workers	250	1,200	300,000
Safety boots (steel toe): skilled + supervisory	25	3,000	75,000
Rubber safety boots: priority unskilled workers	100	1,200	120,000
Hi-visibility vests: all 250 workers	250	600	150,000
Dust masks/N95: 50 workers × 3 months	50	200/month	30,000
Safety gloves: 25 workers × 4 months	25	300/month	30,000
Safety harnesses (work-at-height, 15 workers)	15	4,500	67,500
Safety goggles: skilled workers	15	400	6,000
Ear plugs/muffs: near-machinery workers	30	350	10,500
Fire extinguishers (ABC type, 8 units)	8	5,000	40,000

First-aid kits fully stocked (4 site locations)	4	4,500	18,000
First-aid kit monthly replenishment (4 kits × 4 months)	4	1,500/month	24,000
Stretchers + spine boards	2	8,000	16,000
Safety barriers/cones (1 set)	1 set	15,000	15,000
Hazard/warning tape (40 rolls)	40	500	20,000
Sub-total			**922,000**

Component 6: Community & Worker Awareness Sessions: PKR 250,000

Session Type	Sessions	Participants	Venue/IEC (PKR)	Facilitation (PKR)	Total (PKR)
Worker EHS awareness (quarterly)	4	80	6,000	10,000	64,000
Community EHS/project information	4	40	8,000	15,000	92,000
GBV/SEA/SH women-only sessions	4	25	5,000	10,000	60,000
Communicable disease/hygiene (bi-annual)	2	80	4,000	8,000	24,000
IEC materials (Urdu/Balochi posters, leaflets)	Lump sum	—	10,000	—	10,000
Sub-total					**250,000**

Component 7: GRM & Community Liaison: PKR 200,000

Activity	Unit	Qty	Rate (PKR)	Total (PKR)
GRM registers, complaint forms, acknowledgement slips	Set	5	2,000	10,000
GRM notice boards at entry points (multilingual)	Board	5	3,000	15,000
Hotline SIM card & maintenance (12 months)	Month	12	1,500	18,000
CLO community outreach travel (monthly visits)	Visit	12	5,000	60,000
PCC meetings (quarterly × 4)	Meeting	4	8,000	32,000
Grievance resolution documentation & close-out	Lump sum	1	20,000	20,000
GRM awareness flyers with hotline number	Lump sum	1	15,000	15,000

GRM quarterly progress reports (4 reports)	Report	4	7,500	30,000
Sub-total				**200,000**

Component 8: Training & Capacity Building: PKR 300,000

Training Topic	Events	Participants	Resource Person (PKR)	Venue/Materials (PKR)	Total (PKR)
World Bank ESF/ESS overview: PIU + PDSC	1	20	40,000	10,000	50,000
ESMP implementation, monitoring, reporting	1	30	35,000	10,000	45,000
OHS/CHS and Labour Management Procedures	1	40	35,000	10,000	45,000
GBV/SEA Code of Conduct: contractor workforce	1	40	30,000	8,000	38,000
GRM procedures and community engagement	1	25	25,000	7,000	32,000
Refresher/on-the-job coaching (2 sessions)	2	20	20,000	7,000	54,000
Training materials, handouts, printing	Lump sum	—	—	36,000	36,000
Sub-total					**300,000**

Component 9: Contingency (~10%): PKR 550,000

Basis	Calculation	PKR
~10% of C1–C8 operational budget for corrective actions, unanticipated monitoring, emergency response top-up	Approx. 10% of PKR 5,862,000	550,000
Sub-total		**550,000**

Component 10: Compensatory Tree Plantation (141 Plants): PKR 1,762,500 (FIXED)

Activity	Unit	Qty	Rate (PKR)	Total (PKR)
Pit alignment and marking	Per pit	141	100	14,100
Pit excavation (0.6×0.6×0.6m)	Per pit	141	200	28,200

Pit enrichment (compost/FYM mix)	Per pit	141	250	35,250
Indigenous plant supply (approved species, required height)	Per plant	141	1,000	141,000
Transportation, loading, unloading	Per plant	141	250	35,250
Planting labour	Per plant	141	200	28,200
Individual plant fencing/guard	Per plant	141	500	70,500
Aftercare Year 1 (watering, weeding, gap-filling)	Per plant	141	3,500	493,500
Aftercare Year 2 (maintenance, monitoring)	Per plant	141	3,875	546,375
Close-out survival report to Project Manager	Lump sum	1	336,125	336,125
Sub-total				**1,728,500**

GRAND TOTAL SUMMARY

S. No.	Component	Market-Verified Cost (PKR)
1	C-ESMP Preparation & Implementation	750,000
2	Contractor HSP & Emergency Response	300,000
3	ESMP Staffing (Env. Officer + OHS Officer + CLO)	3,200,000
4	Baseline & Periodic Environmental Monitoring	812,000
5	PPE & HSE Equipment	922,000
6	Community & Worker Awareness Sessions	250,000
7	GRM & Community Liaison	200,000
8	Training & Capacity Building	300,000
9	Contingency (~10%)	550,000
10	Compensatory Tree Plantation (141 plants, 2-yr aftercare)	1,728,500
	GRAND TOTAL	**9,012,500**