Environmental and Social Management Plan (ESMP) of Sehan Flood Irrigation Scheme (Package 1,2 &3)

Balochistan Integrated Water Resources Management and Development Project (BIWRMDP)

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Contents

Contents

Executive Summary 9

1 Introduction 16

1.1 General 16
1.2 Sehan Flood Irrigation Schemes 18
1.3 Scope of the Environmental and Social Management Plan 21
1.4 Justification and Need of the Sub-Project 21
1.5 ESMP Methodology 21
1.6 Data Collection 22
1.7 Environmental and Social Baseline Sampling 22
1.8 Objectives of Environmental and Social Management Plan (ESMP) 24
1.9 Study Team 24

2 Regulatory and Policy Reviews 25

2.1 World Bank Operational Policies 25
2.2 National and Provincial Legislative Framework 28
2.3 International Treaties 33
2.4 ILO Conventions – Ratifications for Pakistan 36

3 Description of Engineering Activities 38

3.1 Engineering Activities/Interventions 38
3.2 Construction Phase Activities 43
3.3 Right of Way (RoW) 54
3.4 Corridor of Impact (CoI) 54
3.5 Establishment of Contractor Camp 54

4 Environmental Baseline 61

4.1 Physical Environment 61
4.2 Biological Environment 65

5 Socio-Economic Baseline 70

5.1 General 70
5.2 Language 70
5.3 Education Facilities 70
5.4 Health Facilities 70
5.5 Water Supply and Sanitation 71
5.6 Communication and Electricity 71

5.7 Means of Transport 71
5.8 Social Conflicts 71
5.9 Household Information 72
5.10 Common Needs to Visit Nearest City 75
5.11 Livestock 75
5.12 Source of Livelihood and Income 76
5.13 Agriculture Tools and Farm Machinery 76
5.14 Seasonal Earnings from Crops 77
5.15 Agricultural landholding and cropping pattern 78
5.16 Anticipated Losses due to the Project 78
5.17 Housing 78
5.18 Land Ownership 79
5.19 Community-Based Organization (CBOs) and NGOs 80
5.20 Customary Institutions 80
5.21 Local Government and Administration 80
5.22 Law and Order Situation 80
5.23 Community Cultural Properties 81
5.24 Community Awareness about Scheme Works 81
5.25 Community Demands 81

6 Environmental and Social Impacts and Mitigations Measures 82
6.1 Overview 82
6.2 Environmental Impacts and Proposed Mitigation Measures 83
6.3 Social Impacts and Proposed Mitigation Measures 109

7 Community and Stakeholder Consultation 120
7.1 General 120
7.2 Methodology of Consultation 121
7.3 Formation of Farmers Organization (FO) 122
7.4 Summary of Discussions 122
7.5 Summary of Findings of Consultation with Farmers 124
7.6 Consultation with Women Community 124
7.7 Women Development Groups (WDGs) 124
7.8 Findings of Women Consultations and Priority Needs 125

8 Institutional and Implementation Arrangements 127
8.1 The Contractor 127
8.2 Contractor's Environmental and Social Management Plan (CESMP) and Contractor Health and Safety Plan 128

9 The Environmental and Social Management and Mitigation Plan 130
9.1 General 130
9.2 Monitoring Mechanism 131
9.3 Aims of Monitoring 132
9.4 Noncompliance and Corrective Measures 132
9.5 Communication, Reporting, and Documentation 133
9.6 Contractor's Health and Safety Plan 137

9.7 Contractor's Code of Conduct 138
9.8 Criteria for the Approval of Contractor Documents 139
9.9 The Environmental and Social Monitoring and Mitigation Plan 139

10 Grievance Redress Mechanism (GRM) 167
10.1 General 167
10.2 Objectives of the Grievance Redress Mechanism 168
10.3 Principles, Procedures, and Timelines 169
10.4 Grievance Recording and Redress Monitoring 169
10.5 Dissemination 169
10.6 Proposed Mechanism for Grievance Redress under BIWRMDP 170
10.7 Grievance Focal Points (GFPs) 170
10.8 Public Complaints Centre 171
10.9 Grievance Redress Committee (GRC) 172
10.10 The budget of GRM Implementation 173

11 ESMP Budget 174

12 Conclusions 176

13 References 177

Appendices 178

List of Figures

Figure 1:Map of Nari River Basin (NRB) 19
Figure 2:Location Map of the Sub-Project Areas (Package 1, 2 & 3) 20
Figure 3:General Layout Plan of Sehan Flood Irrigation Scheme 42
Figure 4:Work Plan for Executing Engineering Activities (Sehan FIS Package-1) 47
Figure 5:Work Plan for Executing Engineering Activities (Sehan FIS Package-2) 48
Figure 6:Work Plan for Executing Engineering Activities (Sehan FIS Package-3) 49
Figure 7:View of tree cover at Sub-project area 52
Figure 8:Scattered vegetation cover at scheme area 52
Figure 9:View of land area at proposed road crossing structure site 53
Figure 10:Another view of trees in scheme area 53
Figure 11:Proposed Main Camp Location of Each Package 56
Figure 12: Minimum Generator Stack Height and Clearance 96
Figure 13: Key Steps in Grievance Redress Mechanism 168

List of Tables

Table 1: Assessment of World Bank Policies in accordance with ISDS & ESIA 25
Table 2: National and Provincial Legislative Framework 28
Table 3: International Treaties 33
Table 4: ILO Conventions 37
Table 5: List of Construction Activities 38

Table 6: The Construction of Sehan Channel 43
Table 7: The Details of Distributary Minors 43
Table 8: List of Construction Material Required 43
Table 9: Construction Work Plan/Schedule 46
Table 10: Land Donated from Farmers of Mekhtar Town 50
Table 11: Machinery and Tools/Equipment Required for Earthworks and Civil Work 53
Table 12: General Camp Site Best Practice Guidelines 57
Table 13: Waste Management collection and disposal Techniques 59
Table 14: Baseline Sampling 61
Table 15: Water Quality Sample Results 62
Table 16: Ambient Air Quality Sampling 63
Table 17: Noise Level Monitoring 63
Table 18: Climatic Conditions 64
Table 19: Average Temperature and Humidity Level 64
Table 20: List of Mammals 66
Table 21: List of Key Mammals 67
Table 22: List of Avi-Fauna 67
Table 23: List of Key Avi-Fauna Species 68
Table 24: List of Reptiles and Amphibians 68
Table 25: List of Key Reptiles and Amphibians 69
Table 26: Education Facilities 70
Table 27: Health Facilities 71
Table 28: Number of households and total population 72
Table 29: Age of Respondent 72
Table 30: Education Level 73
Table 31: Average Family Size 74
Table 32: Family System 74
Table 33: Marriages 75
Table 34: Purpose of the Visit to nearest City 75
Table 35: Average No & Type of Livestock Ownership 76
Table 36: Average cost of Livestock 76
Table 37: Type of Agriculture Tools and Machinery 77
Table 38: Estimated Expenses per Year per Acre 77
Table 39: Average Seasonal Earnings/acre 77
Table 40: Anticipate Losses due to Project 78
Table 41: Ownership of Rooms 78
Table 42: Housing Type 79
Table 43: Plot Size 79
Table 44: Community Cultural Properties 81
Table 45: Associated environmental and social impacts 84
Table 46: Impact Characterization- Rehabilitation of Irrigation Structures 86
Table 47: Proposed Waste Disposal System 87
Table 48: Impact of Characterization-Dismantling and Demolition of Structure and Facilities 88
Table 49: Impact of Characterization-Covid-19 89
Table 50: Name of Focal Person 89
Table 51: Impact of Characterization-Air Quality 95
Table 52: Potential for Dust Emissions by Works Activity 97

Table 53: Impact of Characterization-Dust Generation 97
Table 54: Activities and Potential Impact 98
Table 55: Impact Characterization- Health and Safety 99
Table 56: Workers Accommodation Guidance Note (World Bank Group-IFC/EBRD) 100
Table 57: Noise Levels of Equipment/Machinery 102
Table 58: Impact Characterization- Noise and Vibration 103
Table 59: Felling of Trees 103
Table 60: Impact Characterization-Loss of Vegetation and Trees 104
Table 61:Proposed Tree Plantation under the Forest Component of the BIWRMDP 105
Table 62: Impact Characterization-Surface and Ground Water Pollution 106
Table 63: Impact Characterization-Fauna 108
Table 64: Impact Characterization- Induced Economic Development 109
Table 65: Impact Characterization-Site Security 110
Table 66: Impact Characterization-Impediment to Community Movement 112
Table 67: Impact of Characterization-Community Disturbance 113
Table 68: Impact Characterization- Community Health and Safety 114
Table 69: Impact Characterization- Labor Influx 115
Table 70: Gender-based violence or sexual exploitation and abuse 116
Table 71: Location and date of consultative meeting with Male Community 121
Table 72: Location and date of formation of FO 122
Table 73: Summary of Key Discussions 122
Table 74: Consultative meeting with Women Community 124
Table 75: Location and date of Meeting for the formation of WDGs 125
Table 76: Meetings carried out with District Administrations 126
Table 77: Distribution of Periodic Reports 133
Table 78: Training Subjects for inclusion in Contractor Training Plan 134
Table 79:Environmental Mitigation and Monitoring Plan 140
Table 80: Social Mitigation and Monitoring Plan 161
Table 81: Member of GRM Focal Women Member 170
Table 82: Member of GRM Male Focal persons 171
Table 83: ESMP Implementation Cost Estimates (Applicable for Each Package Separately) 174

ABBREVIATIONS AND ACRONYMS

BCM	Billion Cubic Meters
B-EPA	Balochistan Environmental Protection Agency
BWPPCM	Balochistan wildlife protection, preservation, conservation and management Act, 2014.
CBOs	Community Based Organizations
CCA	Culturable Command Area
CESMP	Contractor Environmental Social Management Plan
CFS	Cubic Feet per second
CoI	Corridor of Impact
Cusec	Cubic feet per second
dB	Decibel
EA	Environmental Assessment
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
EMU	Environmental Management Unit
EPA	Environmental Protection Agency
ESMP	Environmental and Social Management Plan
ESS	Environmental Safeguard Specialist
FO	Farmers Organizations
GBV	Gender Based Violence
GCA	Gross Command Area
GoB	Government of Balochistan
GRM	Grievance Redress Mechanism
GW	Ground Water
HDPE	High-Density Polyethylene
HSE	Health Safety & Environment
HSP	Health and Safety Plan
ICR	Implementation Completion Report
IEE	Initial Environment Examination
IFC	International Finance Cooperation
IP	Inspection path
IUCN	International Union for the conservation of nature
MAF	Million-acre feet
M&E	Monitoring and Evaluation Consultants
NEQS	National Environmental Quality Standards
NGO	Non-Governmental Organizations
NIP	Non-Inspection Path
NSDWQs	National Standards for Drinking Water Quality Standards
OFWM	On-Farm Water Management
O&M	Operation and Maintenance
OP	Operating Procedure
PAD	Project Appraisal Document
PAP	Project Affected Person(s)
P&D	Planning & Development
PD	Project Director
PHE	Public Health Engineering
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSIAC	Project Supervision and Implementation Consultants
RD	Reduce Distance
RoW	Right of Way
SEA	Sexual Exploitation and Abuse
SOP	Standard Operation Procedures
SSESMP	Site Specific Environment and Social Management Plan

SW	Surface Water
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
VRB	Village Road Bridge
WB	World Bank
WBG	World Bank Group
WDG	Women Development Group

Executive Summary

Background[1]

Balochistan faces an acute water scarcity problem and compared to Pakistan's other provinces is most at risk from climate change and least able to address and manage water-related development challenges. Floodwater generated by intense and irregular rainfall is the largest usable water resource in Balochistan. Extended droughts and destructive flash floods are common place and are expected to get worse with future climate change. Rainwater is harnessed for irregular spate (or flood) irrigation. Spate irrigation in the province, however, is generally poorly managed and reliant on poor infrastructure, making it both relatively inefficient and unproductive.

Groundwater is significantly over-extracted and this has led to major declines in groundwater levels in many parts of the province. Given the low frequency of rainfall events, groundwater recharge is limited. This also has major impacts on health and human development. Water is critical to the irrigation that underpins food security in semi-arid Balochistan. Most of the rural poor in Balochistan depend on unreliable surface water irrigation (either spate irrigation or rainfall harvesting), or livestock-based production across the extensive but relatively unproductive rangelands of the province. In the current context, improving rural livelihoods and stimulating economic growth require vastly improved management of the scarce water resources of the province.

Balochistan Integrated Water Resource Management and Development Project (BIWRMDP)

The GoB has received financial support from the World Bank for the Balochistan Integrated Water Resources Management and Development Project (BIWRMDP) to strengthen the capacity for water resource monitoring and management and to improve community-based water management for all related sectors such as irrigation, agriculture, forest, health, environment, and livestock.

The Sehan Flood Irrigation Scheme (FIS) area falls under the spate irrigation network and no irrigation systems exist in the area. This scheme will be completed in three separate packages which include the Construction of the weir, head regulator; under sluice, construction of the Sehan

[1] Project Appraisal Document (PAD) BIWRMDP, pp. 2-3

Channel from RD 00 to 12+600 (tail end) in different packages[2], fall structures, outlets, box culverts, distributary minors, and road crossing structures. Further details of engineering interventions to be carried out in a specific package are provided in Section 3.1. The material required for construction includes earth fill material, spall, stones for stone pitching, aggregate, cement, steel, and sand. For the production of concrete, a batching plant will be installed by the contractor. Further details of construction material requirements are given in section 3.2.3.

Associated work activities include the construction of a contractor's temporary camp. Under each package, one main camp will be constructed by the contractor to carry out sub-project activities and will accommodate a concrete batching plant, power generators, workshops, offices and residence, storage of materials (i.e., fuel / mixed chemicals, other hazardous materials), sanitation and welfare facilities, waste disposal systems, and parking facilities for vehicles.

The Environmental and Social Management Plan

This ESMP provides details about BIWRMDP, regulatory and policy reviews, engineering activities, environmental and social baselines, impact and mitigation, community, and stakeholder consultation, institutional and implementation arrangements, grievance redress mechanism, and budget. The ESMP has been completed in accordance with provincial and national legislation, and the World Bank's Operational Policies (OPs). It will be included in the tender/contract of each package (1, 2 & 3) of the Sehan Flood Irrigation Scheme as an integral part of the bid document.

In accordance to the Integrated Safeguard Data Sheet (ISDS) the BIWRMD Project is classified as Category A which means the project has potentially significant adverse environmental impacts that are sensitive and diverse. While this sub-project is classified as Category B due to short-term and site-specific low to moderate levels of adverse impacts.

Environmental Baseline

During the baseline study, the analysis of four water samples collected from the scheme area showed that the total coliform, fecal coliform, and escherichia coli were found above the permissible limit of NDWQs in groundwater samples. The project activities will not deteriorate the quality of the water in the scheme area as the mitigation measures proposed for the project will be adopted.

The ambient air quality pollutant testing carried out at the two locations showed that the tested pollutants were found within the permissible limits of NEQs and WB standards. This reflects that ambient air quality in these areas is good.

[2] The proposed length of Sehan channel is 12.6 km long and the construction of this channel will be completed in three packages.

The maximum average noise level recorded during the day time was 65dB, while the maximum average noise level recorded during the nighttime was 56db. It is evaluated that the noise levels recorded were within the permissible limits of NEQs.

During the survey, it was found that 395 trees exist within the RoW of the Sehan channel and distributary minors (1&2) and will be cut. The tree species include Babur *(Acacia Nilotica*), Ber *(Ziziphus nummularia),* and Al-mond *(Prunus amygdalus*). While the different types of scattered vegetation cover recorded during the walk-through survey are; Makhai (*Caragana ambigua),* Zarga (*Prunus eburnean),* Sasai (*Erbenus stellate),* Ghuzaira (*Stockia bruchica),* Sandraza (*Lactuca orientalis),* Tarkha (*Artemisia maritima),* Spalmae (*Callotropi sprocera),* Sargara (*Cymbopogon jawarancusa),* Sabba (*Chrysopogon serrulatus),* Washta (*Stipa pennata).*

There are no protected or sensitive areas in the surroundings of the scheme area.

The presence of fish in the Sehan River has not been observed as this river only depends upon flood water and cannot support life due to the inconsistent floodwater flow of the river and which is only available during the rainy season. Further details regarding fish and studies to be carried out are provided in section 4.2.3.6.

Socio-economic profile (Baseline)

Societal institutions and *Language*: The Tribal system prevails in the scheme area, and is the established and preferred mechanism, in comparison to state systems, for dispute resolution and grievance redress. The community living in the scheme area is only the Hamzazai (Kakar) tribe and *Pashto* is the mother tongue, while the Urdu language is also commonly spoken for communication by the residents of these villages.

State of law and order: The law-and-order situation in the scheme area is under the control of the district administration, police, and Frontier Corps (FC). The current security situation of the project area is better than in the past due to the presence of security forces but still the security risks in the Balochistan Province are high.

Education: For boys, there are twelve primary, two middle, one high school, and a college and for girls, there are six primary, one middle, and one school available in the scheme area.

Health Facilities and Problems: There is one Tehsil Headquarters Hospital, a Rural Health Centre, two basic health units (BHU), two dispensaries, four midwifery units, and one private maternity home functional in the Mekhtar town of Tehsil Mekhtar. During the survey, it was revealed that these health facilities only provides minor to moderate general treatments that fulfilling most of the health requirements of the rural population.

Water supply and sanitation: There are ten water supply schemes in the sub-project area for drinking water and domestic use, out of these, three are non-functional. Generally, the

communities are deprived of water availability due to frequent and long hours of outage of electricity, which in most cases are 20 hrs long. Therefore, due to the non-availability of alternative water resources, the villagers are reliant to fetch groundwater from the closest private tube wells operated by solar panels using donkeys and other livestock for transportation to meet their drinking and other domestic needs. There is no sewerage and sanitation system in the scheme area.

Transport and Roads: The scheme area is located within Mekhtar City (Tehsils of the district) and which is 80 km away from Loralai City and 170 km from Quetta city. The community travels using local transport like minibusses, buses, or private taxies, and pickups. Individuals in the community often use their source of transport (mainly motorbikes) for local use. The link roads are in poor condition and need construction/rehabilitation.

Cultural/community sites and properties: There are three graveyards and six mosques in the scheme area. These cultural properties do not fall in the Right of Way (RoW) and will not be disturbed by the proposed civil works.

Community-based organizations: One local NGO, Balochistan Rural Support Program (BRSP) is actively working in the scheme area. They are providing support in different sectors such as education, livelihood, microcredit, and physical infrastructure schemes at the village and union council levels.

Environmental and Social Impacts and Proposed Mitigations Measures

The overall BIWRMD Project area is under Sailaba, Khushkaba, and tube well-irrigated farming systems but the little area is brought under cultivation as farmers can't control and manage the floodwater. The irrigation system is also not available in the scheme area, therefore, the farmers divert the floodwater to their lands by locally available means on a temporary basis which also results in damaging crops and infrastructure in the scheme area. The construction of proposed activities will have a long-term positive impact throughout the command area of the scheme. The construction of hydraulic structures will reduce the loss of floodwater, sedimentation, and discharge will be controlled. The construction of the 12.6 km long Sehan channel and two distributary minors will increase the efficiency and effectiveness of floodwater distribution to the downstream side of the command area, thus providing water availability benefits to the agricultural land at the tail end. It will also improve the reliability and equity of irrigation flow resulting in ultimate user satisfaction. The construction of weir and fall structures will also cause water ponding on the upstream side, increasing irrigation capacity and providing a beneficial breeding environment for fauna habitat.

The further anticipated environmental impacts related to Sehan FIS include the adverse impacts on air quality and noise levels may go up due to movement and operation of machinery and vehicles and construction works, waste generation, potential risk of contamination of surface and ground water due to improper waste disposal and spills, occupational health and safety risks during construction activities and risk of COVID-19 as large number of workers will be working on the sub-project. It is anticipated that during the construction of the Sehan channel and distributary

minors (1&2), 395 trees are expected to be cut. New trees with 1:5 will be planted. The Sehan FIS does not fall in any of the wildlife habitats and no harmful impacts directly or indirectly are expected due to construction activities on the habitat and biodiversity. All of these risks and impacts are localized and temporary in nature, and will be addressed through management of civil works, good housekeeping, and implementation of proposed mitigation measures.

The project has experienced two incidents of the explosion of a landmine on an ongoing World Bank-funded project site in the Sibi district of NRB in January and April 2021. Keeping this in view, the project conducted a detailed security risk assessment and management steps were proposed for the sub-project area sites (camp and work areas). Due to the influx of labor, there is a risk of impact GBV and SEA and abuse among women and children and other vulnerable population groups. To mitigate all these risks, the contractor shall comply with the contractor's guidelines and agreement with labor to prevent and set clear boundaries for acceptable and unacceptable behaviors. The establishment of one labour camp at each package (approx. 10,000 sq ft) will be constructed on private land which will generate various waste (i.e. Domestic, sanitary, etc). To mitigate these issues, the camp will be constructed at least 500 m (1,640 ft) away from Mekhtar Town or the water body.

In addition, community disturbance will also be created due to the expected increase in traffic volume and construction of road crossings and box culvert structures which may result in congestion on transport routes and also raises the risk of accidents. To mitigate this, four (04) temporary diversions of the road shall be constructed at (RD) 4+200, RD 9+000, RD 9+900, and RD 11+250 so that community disturbance can be avoided. Approximately, 39 acres of land are required for the construction of the Sehan Channel and two distributary minors at 24 different locations and donated by the farmers of Mekhtar through the voluntary land donation (VLD) process. The acquired land does not have a negative impact on the livelihood of any vulnerable group.

Stakeholders Consultation and Participation

The consultations were carried out to disseminate project information among the project stakeholders; record the perception of the community and their views on project interventions; and, obtain community feedback regarding the severity of impacts and recommendations for mitigation measures. The consultations were done at different times and dates. In this regard, two rounds of consultations were held with the communities of the Sehan scheme. The first phase of a round of consultations was held from May to June 2020 with female folks and onward to October 2020 while the second round of consultations with a male was held from May 2020 to August 2020 of all villages were consulted during the preparation of this ESMP. Further details of the consultations carried out are provided in Section 7.

The Environmental and Social Management Plan (ESMP) and Institutional Arrangements

This ESMP to be implemented during the construction phase of each package (1, 2& 3) to ensure that the mitigation measures proposed in this document are implemented accordingly. It includes monitoring mechanisms and responsibilities. In addition, this ESMP is to be supplemented by various plans to be submitted by the contractor, (i.e., Contractor Health and safety, and Contractor Environmental and Social Management Plan) in accordance with the respective package.

On behalf of the Balochistan Irrigation Department (BID), Project Management Unit (PMU) is led by a Project Director (PD) who will be responsible for the implementation of this ESMP. At the basin levels, there are Project Implementation Units (PIUs). The PMU and PIUs will be supported by Project Supervision and Implementation Assistance Consultants (PSIAC) and the team of Monitoring and Evaluation (M&E) at the PSIAC level. The Implementation Completion Report (ICR) of the project will rate and evaluate the performance of the implementing agency.

The contractor appointed under each package will be responsible for the implementation of this ESMP during the sub-project's execution phase. The contractor will be required to submit to the PSIAC/PMU, the Contractor's Environmental and Social Management Plans (CESMP) and Health, Safety, and Environment Plan (HSEP) reflecting the contractor's various requirements and methodologies of implementation. The Contractor is also required to appoint a safety supervisor, paramedic staff, health, and safety officer, a human resource officer, and an environmental officer. Further details of these management plans are provided in sections 8.2 and 9.6.

The PSIAC will be responsible of supervision of contractor's site activities and implementation of this ESMP. Each party will submit their monthly reports detailing the findings of their monitoring activities which will be distributed among each of the institutional stakeholders of this ESMP. The format of the monthly monitoring report (PSIAC) is given in Appendix C.

During the preparation of Contractor Health and Safety and Contractor's ESMP, the guidelines of the environmental code of practices (ECOPs) given in Appendix B will be followed by the contractor to implement accordingly.

Grievance Redress Mechanism

A Grievance Redress Mechanism (GRM) for the project will be operational during the implementation of this ESMP. During the public consultations, farmers' organizations (FOs) and communities of all villages were given a detailed orientation about the project GRM and its procedures. FOs through mutual agreement of their members, have nominated the following Focal Persons for grievance redress at the FOs and WDGs level. From which two GRM committees at PSIAC and PIU levels for Sehan (FIS) are formed.

All the contractors and concerned offices will adopt a grievance redressal mechanism for the project to resolve complaints of the public and project people. A public complaint center (PCC) and a grievance redressal committee had already been established for this project. A Social complaints register will also be placed at the Contractor's office, PIU and Engineer's offices to address social, environmental, and other aspects related complaints effectively. The further detail of GRM is given in section 10 of this ESMP.

Budget

The costs for the implementation of ESMP activities during the construction stage shall be included within the civil works contract for this sub-project and, therefore, ultimately borne by the client. The total cost of ESMP and GRM implementation is PKR 30,020,000 (US$ 149,353[3]). The given cost shall be considered separately for each package.

Conclusions

The overall interventions of this scheme will have positive environmental and social impacts. Once the scheme is completed, it will increase the efficiency and effectiveness of floodwater distribution to the downstream areas and within the command area. The anticipated adverse environmental and social impacts will be managed by adopting and implementing necessary mitigation measures.

[3] Exchange rate= 201
https://www.sbp.org.pk/ecodata/rates/war/2022/Jun/10-Jun-2022.pdf

1 Introduction

1.1 General

Project development objectives of the Balochistan integrated water resources management and development project (BIWRMDP) is to strengthen provincial government capacity for water resources monitoring and management and to improve community-based water management for targeted irrigation schemes in Balochistan.

The project will begin the transformation of water management in Balochistan from a narrow irrigation project focus, with an integrated multi-sector river basin planning and development approach. It will be achieved through institutional strengthening, investments in hydro-meteorological data and weather information systems, priority infrastructure investments in irrigation, water supply, and flood protection, and associated watershed and rangeland management.

It is expected that the BIWRMD Project would help in improving the livelihoods of the rural poor in Balochistan by local-level participation to build stronger and more resilient communities and to drive economic development through more efficient, productive, and sustainable management and use of water resources in a watershed context. The project combines technical assistance to the GoB to lay the foundation for a gradual transition to integrated water resource management with targeted investments to support the implementation of this project within a framework of community mobilization and participation in the Porali and Nari basins.

The project will support investments in two of the eighteen river basins in Balochistan. These river basins have been selected based on the current water resources development status and future development opportunities identified through prefeasibility studies, along with the consideration of security issues and a balanced approach to extending the development support of different tribal groups. These choices also reflect a desire to avoid the very arid and less populated western desert basins and avoid the canal-irrigated basins, but to focus on basins dominated by a mixture of perennial and spate irrigation and groundwater-dependent higher value agriculture. Groundwater in the basin is over-exploited in many areas, but considerable opportunities exist for the development of surface water resources.

The selection of two priority river basins is the first step in a long-term process of province-wide water sector strengthening and reform. Tackling two basins also provides an opportunity to learn from sequential implementation and will provide some flexibility to prioritize and expand interventions during implementation should the security situation change significantly.

The Balochistan Integrated Water Resource Management and Development (BIWRMD) project has three major and nine sub-components:

Component A: Institutions, Capacity, and Information: This component will support institutional restructuring, professional development, installation and operation of hydro-meteorological systems, and the establishment of multi-agency river basin information systems that provide public access to all available hydro-met data for a two-project basis. The Project will support the establishment of a hydro-met observation network in the two project river basins, including telecommunication equipment, software for data transmission and analysis, storage conversion of the data into the needed information, and training in network O&M.

Sub-component A1 will support institutional strengthening and restructuring; it will determine appropriate institutional arrangements for the initial stages of IWRM in Baluchistan.

Sub-component A2 will support hydro-meteorological data collection and management to provide the required information platform for improved water resource planning.

Component-B: Water Infrastructure and Management Investments*:* This component will support the implementation of IWRM sectorial investments in the Nari and Porali basins within a framework of community mobilization and participation.

The sub-component B1 will support six irrigation schemes: three each in the Nari and Porali basins, spanning approximately 69,300 ha. Development work will include remodeling of the headwork and secondary canals. The Project will support the construction and rehabilitation of sixteen village water supply schemes.

Sub-component B2 will support a participatory approach to watershed management and rangeland management at the irrigation scheme level, to complement the new infrastructure investments under sub-components B1 and B3.

Sub-component B3 will support the improvement of on-farm and field irrigation water efficiency and farm productivity. On-farm infrastructure will include construction/ rehabilitation of watercourses, water storage tanks/ponds, and farm access roads.

Component C: Project Management & Technical Assistance: This component will support, project management, monitoring and evaluation, and studies. The component will finance expenditures associated with overall project implementation costs, including incremental costs associated with the Project Management Unit (PMU) and the Project Implementation Units (PIUs), Project Supervision and Implementation Assistance (PSIAC) consultants, M&E consultants, and implementation of Management Plans and Strategic Studies including the Environmental Management Plan (ESMP), the Social Mitigation Plan and the Gender Action Plan (GAP). Study tours will also be included with the piloting of new technologies.

1.2 Sehan Flood Irrigation Schemes

The civil works at Sehan Flood Irrigation Scheme will be carried out in three separate packages and each package will be referred to as a “sub-project” in this ESMP report. The farmers divert the floodwater to their lands by locally available means temporarily, as an irrigation system does not exist in the subject area. Therefore, the primary purpose of these proposed works is to ensure adequate, equal, and continuous water delivery to the entire command area during floods. This will be achieved after the construction of Sehan weir, head regulators, under- sluices, box culverts, guide bunds, Sehan channel, two distributary minors, fall structures, and road crossing structures. The further details of construction activities to be carried out each sub-project/package are provided in section 3.1.

1.2.1 Sub-Project Region

The Nari River Basin (NRB) is the largest basin in the Balochistan province. It includes Musakhel, Loralai, Beji, Khost, Chakr Lehri, Bolan-Mushkaf, and Mula sub-basins. It falls in Districts; Musakhel, Loralai, Duki, Ziarat, Hernai, Sibi, and Jhal Magsi. The areas falling in the river basins are connected to Quetta and other districts of Balochistan with metaled roads. The geographical area of the sub-project area lies in the Loralai sub-basin of the Nari River Basin and lies in district Loralai.

Figure 1:Map of Nari River Basin (NRB)

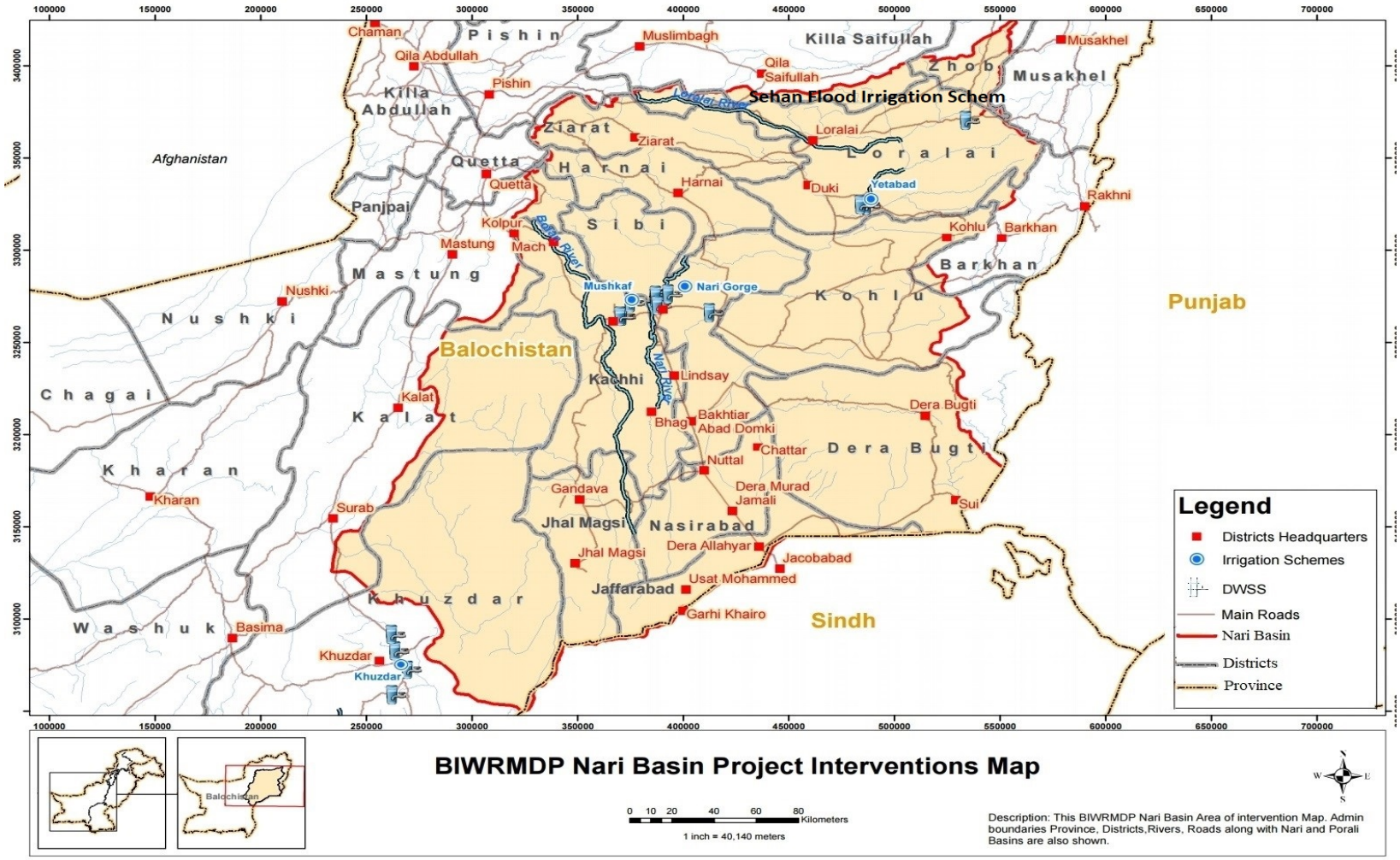
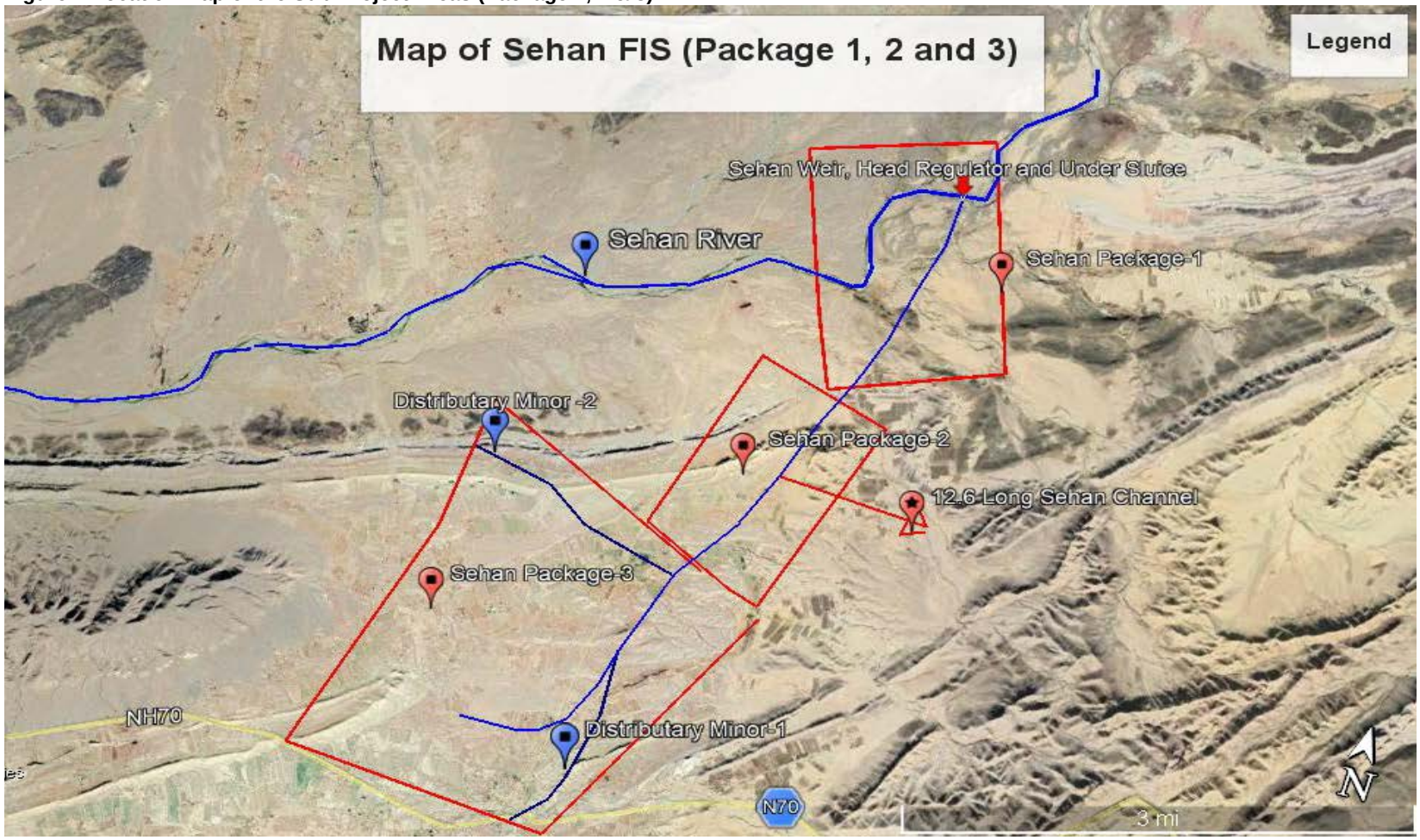


Figure 2:Location Map of the Sub-Project Areas (Package 1, 2 & 3)



1.3 Scope of the Environmental and Social Management Plan

The preparation of the present ESMP study is based on both primary & secondary data, information, and discussions held with stakeholders that cover:

- Anticipated environmental and social impacts due to sub-project interventions
- Proposed suitable mitigation measures for each adverse impact
- ESMP including a monitoring plan, the operational procedures, institutional responsibilities; and
- Integrate COVID19 SOPs and guidelines in all the proposed civil works.
- Cost estimates of ESMP.

This ESMP will be made part of the bidding and contract documents to ensure its effective implementation at all stages as per requirements.

1.4 Justification and Need of the Sub-Project

The community is not in a position to divert floodwater for the Sailaba lands as they can't manage the floodwater without the development of the Spate irrigation scheme. Floodwater is available in the Sehan scheme and it can be utilized by developing Spate farming through the development of this scheme. These subject-projects (Package 1, 2 & 3) will provide benefits 28,800 acres of the command area. In addition, diversification of livelihood is one of the objectives of the Sehan scheme using a concept of integrated land use where fuel-wood plants, forage plants and shrubs and timber can be grown in the watershed area through harvesting runoff and at the same time reduce the sediment load in the water during flood[4].

1.5 ESMP Methodology

The methodology for assessing and mitigating the social and environmental impacts is summarized below:

- Desk review: Environmental Assessment (EA) and Social Impact Assessment & Management Plan (SIAMP), feasibility study reports, engineering design were reviewed during the preparation of the site-specific ESMP for the Sehan FIS (Packages 1, 2 & 3);
- Define the area covered under the ESMP;
- Review of planned civil works (design/alignment/scope of work);
- Review the legal framework (national and provincial) and World Bank policies and guidelines;
- Identify key available related infrastructure resources;
- Identify primary stakeholders including communities (vulnerable groups such as; women, ethnic groups, the poor, etc.), and secondary stakeholders (NGOs, CBOs, Government departments, local elected representative, community leaders, civil administration);
- Socio-Economic and Environmental baseline conditions;

[4] Design Report- Sehan Flood Irrigation Schemes

- Assess temporary and permanent social and environmental impacts;
- Stakeholder consultations; and
- Development of risk mitigation strategy and social and environmental management plan.

The EA and SIAMP of the BIWRMD Project were completed in 2016 and the environmental approval by the Balochistan Environment Protection Agency (BEPA) was accorded on October 19, 2017, vide letter No. DG (EPA) /4762-80/2017-18.

1.6 Data Collection

1). The Primary data for this study was collected through field visits, walk-through surveys, quantitative household surveys, and in-depth qualitative interviews during field visits, and community consultations. Women were also included in the quantitative household survey. In view of cultural norms, female enumerators were specially trained and then mobilized to interview female respondents in separate qualitative consultation sessions.

2). The Secondary data pertaining to various environmental and socio-economic parameters were gathered through the literature review and from the approved project documents.

1.7 Environmental and Social Baseline Sampling

1.7.1 Environmental Sampling

The baseline monitoring of Ambient Air Quality, Water Quality Sample, Noise, and Meteorological parameters was carried out by the Quality Testing Service on behalf of the Project Management Unit of BIWRMDP in October 2020.

1.7.1.1 **Analysis of Ambient Air Quality**

The Ambient Air Quality analysis for 24-hour continuous monitoring at the subproject area was conducted for the following parameters:

- Carbon Monoxide
- Nitrogen Dioxide
- Sulfur Dioxide
- Particulate Matter (PM 10)
- Noise Levels
- Ozone
- Total Suspended Particle (TSP)

1.7.1.2 **Meteorological Parameters**

The following meteorological parameters at each of the sites:

- Temperature
- Relative Humidity

1.7.1.3 Noise Level

During the ambient air monitoring, the 24 hrs. Noise level monitoring was also conducted at the same locations and was compared with World Bank EHS guidelines and National Environmental Quality Standards. The detailed result of each parameter analysis is provided in Section 4 of this ESMP.

1.7.1.4 Water Quality Testing

The eight water samples (02 SW & 02 GW samples) were collected from the Sehan River and villages. The physical, chemical, and microbiological parameters of surface and ground-water quality were analyzed of the collected sample and compared with National Drinking Water Quality Standards (NDWQs).

1.7.1.5 Chemical Test

Alkalinity, Bio-carbonate, Chlorides, Hardness (CaCo3), Magnesium, Potassium, Sulfate, Nitrate, Fluoride, Iron, Arsenic, Calcium, Copper, Zinc, Mercury, Copper, Ammonia, Nitrite, Selenium.

I. Microbiological Test

Total Coliforms, Fecal Coliforms, Escherichia Coli (E. Coli).

II. Physical Test

Color, Odour, Taste, Turbidity, Conductivity, pH, TDS, TSS

The detailed result of each parameter analysis is provided in Section 4.1 of this ESMP.

1.7.1.6 Soil Quality Test

The soil tests analysis of pollutants/chemicals were conducted of cadmium (Cd), Chromium (trivalent and hexavalent), Copper (Cu) total, Mercury (Hg) total, Lead (Pb), Nickel (Ni), Zinc (Zn), Arsenic (As) and Pesticides (Organo-chlorine).

1.7.2 Socio-Economic Baseline

Quantitative Sampling of villages under the Sehan Flood Irrigation Scheme was carried out from April to May 2020. The sample size was 17 %. Out of a total of 1,161 households, 193 households were included in the baseline survey; both male and female members of households were interviewed. The details of the socio-economic survey are provided in Section 5 and consist of:

- Village profile;
- Household socio-economic profile.

1.8 Objectives of Environmental and Social Management Plan (ESMP)

The following are the objectives of the ESMP.

i. Identify the social and environmental impacts of the subproject and related activities.
ii. Suggest suitable measures for mitigation of identified impacts at planning, design, and implementation stages of subproject and to avoid, eliminate, or reduce adverse impacts if any.
iii. Propose an environmental and social monitoring program to ensure that mitigation measures are implemented during the subproject execution and timely corrective actions are taken where required.
iv. In addition to adopting mandatory safety measures (SOPs) for laborers and workers in the event of pandemic COVID19, as given by the government, World Bank, and WHO. Propose the institutional arrangements required to implement and monitor the ESMP.
v. To carry out monthly social and environmental monitoring and ensure compliance and reporting non-compliance in accordance with this ESMP.
vi. Appointment of full-time ESMP staff in the field, as given in section 8.2.1.
vii. Capacity building of contractor and project staff.

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.

1.9 Study Team

The details of the team members involved during the preparation of this ESMP and in various activities is provided in Appendix A.

2 Regulatory and Policy Reviews

This chapter provides details of the national and provincial legislation, regulations, EPA guidelines, and World Bank Operational Policies and guidelines which are relevant and applicable to the project. Mainly, this chapter is divided into sub-sections as under;

Section 2.1: Provides the details of the World Bank Operational Policies

Section 2.2: Provides the details of the National and Provincial Legislative Framework

Section 2.3: International Conventions/Treaties

2.1 World Bank Operational Policies

The World Bank (WB) has approved a series of Operational Policies that define the conduct of WB operations. The safeguard policies provided in **Table 1** are triggered to the project level and in accordance with the Integrated Safeguard Data Sheet (ISDS). While a brief rationale of policies for each one on this specific sub-project which are triggered and not triggered is also summarized below:

Table 1: Assessment of World Bank Policies in accordance with ISDS & ESIA

Directive	Policy	As per ISDA & ESIA	
		Triggered	Not Triggered
Environmental Assessment	OP/BP/GP 4.01	✓	
Natural Habitats	OP/BP 4.04	✓	
Pest Management	OP 4.09	✓	
Indigenous Peoples	OP 4.10		X
Involuntary Resettlement	OP/BP 4.12	✓	
Forests	OP/BP 4.36		X
Safety of Dams	OP/BP 4.37		X
Projects on International Waterways	OP/BP/GP 7.50		X
Projects in Disputed Areas	OP/BP/GP 7.60		X
Physical Cultural Resource	OP 11.03/OP 4.11	✓	

2.1.1 Environmental Assessment (OP 4.01)

The World Bank (WB) requires that an environmental assessment of all WB financed projects is carried out by the Borrower to ensure that a project is environmentally sound and sustainable. As such, this policy has been triggered by the Balochistan Integrated Water Resource Development Project (BIWRMDP). The environmental assessment for this project was completed by the team of Independent Advisors and consultants.

The proposed BIWRMD Project is classified as Category A which means the project has potentially significant adverse environmental impacts that are sensitive and diverse while the Sehan FIS fall in Category B due to short-term and site-specific low to moderate levels of adverse impacts. These impacts may affect areas of bordering scheme sites. The EIA had been completed in accordance with the relevant Operational Policy (OP), to identify the extent and consequences of these impacts, and to develop an Environmental Management and Mitigation Plan. The OP 4.01 states that a range of instruments can be used to satisfy the Bank's EA requirement including:

- Environmental Impact Assessment (EIA)
- Regional or Sectorial
- Environmental Audit
- Hazard or Risk Assessment
- Environmental and Social Management Plan (ESMP)

Accordingly, in accordance with the requirement of the Environmental and Social Management Plan for the sub-project will be implemented accordingly.

2.1.2 Natural Habitat (OP 4.04)

The following definition applies in this policy[5]:

- Natural habitats are land and water areas where (i) the ecosystems' biological communities are formed largely by native plant and animal species, and (ii) human activity has not essentially modified the area's primary ecological functions.
- Critical Natural Habitat were (i) existing protected areas and areas officially proposed by the government as protected areas, and (ii) sites identified on the supplementary list prepared by the Bank.
- Significant conversion is the elimination or severe diminution of the integrity of a critical or other natural habitat caused by a major, long-term change in land or water use.
- Degradation is a modification of a critical or another natural habitat that substantially reduces the habitat's ability to maintain viable populations of its native species.

As per the ESIA of the project, this policy is triggered because of the potential environmental impacts of project activities on the natural habitats and protected areas in the two river basins. Specific requirements of the policy have been adopted in this ESMP in case if any possibility. Namely, appropriate conservation and mitigation measures have been included such as the removal of adverse impacts to habitats; mitigation measures to minimize the ecological damage; and, restoration of degraded habitats (tree plantation, given in Section 6.2.8.1.

[5] https://policies.worldbank.org/sites/ppf3/PPFDocuments/Forms/DispPage.aspx?docid=1568&ver=current

2.1.3 Physical Cultural Resource Plan (OP 4.11)

The objective of this policy is to avoid or mitigate adverse impacts on physical cultural resources. In accordance with this policy, the project has completed a baseline survey of the sub-project area to identify physical cultural resources. The sub-project activities will not cause an impact on the physical, cultural resources; but the project activities include rehabilitation and construction works and it may involve excavations, which may have implications on chance finds. Therefore, this policy is triggered. A procedure to manage chance finds is also included in Appendix H. In case of any design changes which may harm, physical, cultural resources, a complete assessment of the potential impacts, formulated mitigation measures shall be carried out.

2.1.4 Pest Management (4.09)

In assisting borrowers to manage pests that affect either agriculture or public health, the WB supports a strategy that promotes the use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides. In WB financed projects, the borrower must address pest management issues in the context of the project's environmental assessment.

The sub-project involves intervention that will lead to enhance agriculture activities, therefore, the use of pesticides, herbicides, or fungicides will take place, therefore this policy triggered. The integrated pest management plan (IPMP) is given in Appendix G.

2.1.5 Involuntary Resettlement (OP/4.12)

The WB policy on involuntary resettlement is triggered in any project with the potential to result in the involuntary taking of land which results in the relocation or loss of shelter, loss of assets or access to assets, or loss of income sources as well as involuntary restriction of access to legally designate parking and protected areas resulting in adverse impacts on livelihood. This policy is triggered for the Project as a whole, and a Resettlement Planning Framework (RPF) has been prepared, consulted upon, and disclosed.

By using screening criteria involuntary screening checklist and VLD form, it is evaluated that there is a land requirement of 39 acres for the construction of Sehan Channel and two distributary minors. While there shall be no physical relocation in the sub-project areas.

2.1.6 Labour Influx Guidance Note

It is mandatory requirement in the Bank-financed investment projects which often involve construction of civil works for which the required labor force cannot be fully supplied locally for a number of reasons, among them worker unavailability and lack of technical skills and capacity. In such cases, the labor force (total or partial) needs to be brought in from outside the sub-project area.

Labor influx for construction works can lead to a variety of adverse social and environmental risks and impacts such as; risk of social conflict, increased risk of illicit behaviour and crime, increased risk of

communicable diseases, gender-based violence, child labor and school dropout, child labor and school dropout, increased demand on freshwater resources, camp related land use,

The contractors will hire 25% of the skilled labor outside of the scheme area, therefore, to mitigate this labor influx guidance note shall be adhered by the contractor [6].

2.2 National and Provincial Legislative Framework

The national environmental and social relevant legislation, policies, and guidelines of Pakistan, applicable/not applicable to this sub-project are summarized in the table below.

Table 2: National and Provincial Legislative Framework

Name of the Act	Objectives under the Act	Supervising Responsibility and Monitoring	Time Frame
Hazardous Substance Rules 2003 (Draft)	The objectives of the Hazardous Substance Rules to implement licensing requirements for the generation, collection, transport, treatment, disposal, storage, handling, and import of hazardous substances. The rule has not yet notified[7].	PSIAC and PMU	During the establishment of contractor's camps
Employment of Child Act, 1991	The objectives of the Employment of Child Act (1991) disallow child labor in the country. It also states that no child shall be employed or permitted to work in any of the occupations set forth in the Act (such as transport sector railways, construction, and ports) or in any workshop wherein any of the processes defined in the Act is carried out[8].	PSIAC and PMU	Entire Project Duration
Factories Act 1934	This Factories Act (1934) clearly defines the roles and responsibilities of the factories, aims to ensure the health and safety of workers, and defines the basic facilities to be provided. The Act also provides regulations for handling and disposal of toxic and hazardous materials. As construction activity is classified as 'industry', these regulations will be applicable to the sub-project construction contractor.	PSIAC and PMU	Entire Project Duration
Protection of Trees and Brushwood Act (1949)	The Protection of Trees and Brushwood Act prohibits illegal cutting or lopping of trees along roads and canals planted by the Forest Department. The matter of permission to remove any trees, their compensation, and plantation to replace the lost trees will be taken up with the Balochistan Forest authorities.	----------	----------

[6] labor influx guidance note 2016.pdf
[7] http://environment.gov.pk/PRO_PDF/HAZ-RU03.PDF
[8] http://www.na.gov.pk/uploads/documents/1335242011_887.pdf

Name of the Act	Objectives under the Act	Supervising Responsibility and Monitoring	Time Frame
Forest Act (1927)	This federal Forestry Act of 1927 authorizes Provincial Forest Departments to establish forest reserves and protected forests. The Act prohibits any person to start a fire in a forest, quarry stone within a forest, remove any forest produce or cause any damage to the forest by cutting trees or clearing up the area for cultivation or any other purpose.	----------	--------
Balochistan Cultural Heritage and Preservation Act of 2010	This Act empowers the Provincial Government to protect cultural heritage in the Province. It empowers the government to compulsorily acquire any heritage that could be lost to various threats. It states punitive action for the willful destruction of protected cultural heritage.	-------	-------
Motor Vehicle Ordinance (1995)	The Motor Vehicle Ordinance deals with the powers of the Motor Vehicle Licensing Authorities and empowers other related agencies to regulate traffic rules, vehicle speed, and weight limits, and vehicle use, to erect traffic signs, and to prescribe special duties of drivers in case of accidents.	PSIAC and PMU	Entire Project Duration
The Land Acquisition (Act LAA) 1894	The Land Acquisition Act (LAA) of 1894 is the key legislation that has direct relevance to resettlement and compensation in Pakistan. Each province has its own interpretation of the LAA, and some provinces have also passed provincial legislations. The Land Acquisition (Balochistan Amendment) Act 1985 having been passed by the provincial assembly of Balochistan on 9th October 1985. The LAA and its implementation rules require that before the implementation of any development project the privately-owned land and crops are compensated to titled landowners and/or registered tenants/users etc. Based on the LAA, only legal owners and tenants registered with the Land Revenue Department or those possessing formal lease agreements are eligible for compensation. Under this Act, users of the Rights of Way (RoW) are not considered "affected persons" and thus not entitled to any mitigating measure, compensation, or livelihood support.	--------	---------
High Way Safety Ordinance (2000)	The Highway Safety Ordinance includes provisions for licensing and registration of vehicles and construction equipment; maintenance of road vehicles; traffic control agencies, penalties, and procedures; and the establishment of a police force for motorways and national highways to regulate and control the traffic as well as keep the highways clear of encroachments. No high way or motorways exists nearby to the sub-project area.	----------	---------
Balochistan Environmental	Balochistan Environmental Protection Act of 2012 provides the overarching provincial framework for the protection of the environment in Balochistan. It builds on the provisions of PEPA and	PSIAC and PMU	Entire Project Duration

Name of the Act	Objectives under the Act	Supervising Responsibility and Monitoring	Time Frame
Protection Act (2012)	localizes them in the provincial context and taking into account the following points: • Provisions for integrated watershed management; • Regulation of sustainable abstraction of groundwater; • Measures to protect human health and ecosystems; • Any other provision necessary for the sustainable use and management of water resources. • A landowner or individual who uses the land on which any activity or process is performed or undertaken which causes or is likely to cause significant pollution of a water resource must take measures to prevent any such pollution[9].		
Balochistan Wildlife preservation protection conservation and management Act 2014 (BWPPCMA)	This legislation is guided primarily by the principle of ensuring the protection, preservation, promotion, conservation, management, and sustainable development of wild animals in recognition of their position as key components of biological diversity with social, cultural, economic, and ecological significance for the present and future generations. It further encourages the active participation of local communities in the protection of wildlife resources in the Province. Community participation is further encouraged through economic incentives and benefit-sharing. The Act embraces the principle of co-management of protected areas and the promotion of livelihood activities in protected areas. The proposed project activities will be conducted in compliance with the requirement of this Act[10].	PSIAC and PMU	Entire Project Duration
Canal and Drainage Ordinance (Amended 2000 & 2006)	The Balochistan Canal and Drainage Ordinance, entitles the Provincial government to use and control, for public purposes, the water of all rivers and streams flowing in natural channels, of lakes, sub-soil, and other natural collection of still water. The Ordinance empowers the government to define, in identifying areas, a cropping pattern for controlling waterlogging and soil salinity. The government may also impose a ban on the cultivation of certain crops situated outside the canal command area and can, in the event of any violation, impose penalties in terms of punishment and fine.	PMU	Entire Project Duration -
Balochistan Water and Sanitation Act, 1989	This Act provides for the establishment of the Water and Sanitation Authority. The Authority is responsible for providing an adequate supply of potable water and for eliminating waterborne diseases through the provision of effective sewerage and sanitation systems. The Act defines the composition of the Authority and its powers and	PSIAC and PMU	During the construction of contractor camps

[9] Environmental Assessment-BIWRMD

[10] https://www.elaw.org/system/files/balochistan_environment_protection_act_2012-1.pdf

Name of the Act	Objectives under the Act	Supervising Responsibility and Monitoring	Time Frame
	functions. The Authority is empowered to issue licenses, set charges and recover revenues for the services provided, authorize the discharge of industrial waste into sewerage or sanitation systems, and protect water resources and water supply systems from sources of contamination or pollution.		
Minimum Wages Ordinance 1969	This ordinance provides support to the employee that each employer shall be responsible to paid minimum wages to all unskilled/unskilled workers employed, either directly or through a contractor, as per the prescribed rate of the government of Pakistan.	PSIAC	Through the sub-project
Workmen compensation Act of 1923	This law deals with the payment of compensation by the employer to work or workman (not an officer) when he meets with an accident during his working period. Natural disabilities are excluded from the compulsory payment of compensation. The occurrence of an accident after the working hours outside the working premises also excluded from the payment of compensation. Only such accidents are covered under this law which occurs due to the work for which worker is employed.	PSIAC	Entire project duration
The Bonded Labor System (Abolition) Act 1992	According to this act, forced labor is any type of work or kind of service in which someone engages involuntarily and under implied coercion a manifest threat of a party or oppression measures. Bonded labor can exist in the following forms under different situations: • Bonded labor in exchange for advance/an amount of money given before services are rendered, received by a person or his family. • Bonded labor as a consequence of some social or customary obligations. • Bonded labor in exchange for an economic benefit/consideration received by a person or his family, • Bonded labor of a guarantor in exchange for a debtor who was unable to pay off his debt. Bonded labor is prevalent in the agriculture sector, brick kilns, domestic work, and begging.	PSIAC/PMU	Entire project duration
Balochistan Irrigation and Drainage Act of 1997	The Balochistan Irrigation and Drainage Authority (BIDA) Act of 1997 transformed the Irrigation wing of the Irrigation Department into an autonomous Authority for the development and management of irrigation, drainage, and flood control infrastructure. BIDA exercises powers under the Balochistan Canal and Drainage Ordinance and the Balochistan Groundwater Rights Administration Ordinance to formulate and implement policy guidelines regarding water management and use. It is responsible for developing a sustainable irrigation and drainage network through equitable distribution of	PMU	During the formation and registration of FOs.

Name of the Act	Objectives under the Act	Supervising Responsibility and Monitoring	Time Frame
	irrigation water to improve the efficiency of water utilization while minimizing drainage surplus. The proposed BIWRMD Project will need to be cognizant of BIDA (1997) regulations, especially for organizing and registering farmer organizations. The regulations for registration of farmer organizations were approved and issued in 2000. A registrar appointed by BIDA is responsible for registering and maintaining the operations of registered farmer organizations[11].		
The Protection Against Harassment of Women at the Work Place Act 2010	This act provides shelter to women working in any sector. Harassment" means any unwelcome sexual advance, request for sexual favors' or other verbal or written communication or physical conduct of a sexual nature or sexually demeaning attitudes, causing interference with work performance or creating an intimidating, hostile or offensive work environment, or the attempt to punish the complainant for refusal to comply to such a request or is made a condition for employment.	PSIAC/PMU	Entire Project duration

[11] Environmental Assessment-BIWRMD

2.3 International Treaties

Pakistan is a signatory to several Multilateral Environmental Agreements (MEAs). These MEAs set requirements and restrictions to varying degrees to the Member States in order to achieve the objectives of these agreements. However, the implementation mechanism for most of these MEAs is weak in Pakistan and the institutional set-up is largely non-existent. The MEAs agreement is provided in the table below:

Table 3: International Treaties

S. No	International Treaties	Objectives of Treaties	Applicability
1	**Convention on International Trade in Endangered Species (CITES)**	CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.	Yes
2	**The Ramsar Convention (the Convention on Wetlands of International Importance)**	The Convention on Wetlands, called the Ramsar Convention, is the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources.	Yes
3	**Paris climate accord (Convention on Climate Change dealing with greenhouse gas emission**	Paris climate agreement is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC) dealing with greenhouse gas emissions mitigation.	Yes
4	**UN Framework Convention on Climate Change (UNFCCC)**	The UNFCCC convention is an international environmental treaty negotiated at the earth summit in Rio de Janeiro from 3 to 14 June 1992, then entered into force on 21 March 1994. The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.	Yes
5	**Kyoto Protocol**	The Kyoto Protocol is an international treaty that extends the 1992 UNFCCC on climate change to fight global warming by reducing greenhouse gas concentrations in the atmosphere to "a level that would prevent dangerous anthropogenic interference with the climate system.	No

S. No	International Treaties	Objectives of Treaties	Applicability
6	**Montreal Protocol**	The Montreal Protocol on Substances that Deplete the Ozone Layer (a protocol to the Vienna Convention for the Protection of the Ozone Layer) is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion.	No
7	**Basel Convention**	The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	Yes
8	**Convention on Biological Diversity**	The Convention on Biological Diversity was the outcome of the 'Earth Summit' held in Rio-de-Janeiro in 1992, The convention has 3 main objectives: • The conservation of biological diversity • The sustainable use of the components of biological diversity • The fair and equitable sharing of the benefits arising out of the utilization of genetic resources	Yes
9	**Convention for the Prevention of Pollution from Ships (MARPOL)**	It was developed by the international maritime organization in an effort to minimize pollution of the oceans and seas, including dumping, oil, and air pollution.	No
10	**UN Convention on the Law of the Seas (UNCLOS)**	This law of the sea convention defines the right and responsibilities of nations with respect to their use of the world oceans, establishing guidelines for businesses, the environment, and the management of marine natural resources.	No
11	**Stockholm Convention on Persistent Organic Pollutants (POPs)**	Stockholm Convention on persistent organic pollutants is an international environmental treaty, signed in 2001 and effective from May 2004, that aims to eliminate or restrict the production and use of persistent organic pollutants (POPs).	No
12	**Cartagena Protocol**	The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international agreement on biosafety as a supplement to the Convention on Biological Diversity effective since 2003. The Biosafety Protocol seeks to protect biological diversity from the potential risks posed by genetically modified organisms resulting from modern Biotechnology.	No
13	**UN Convention to Combat Desertification (UNCCD)**	The UNCCD in those countries which experience serious droughts. The objectives of this convention to combat desertification in countries experiencing serious droughts	No

S. No	International Treaties	Objectives of Treaties	Applicability
		and/or desertification are to combat desertification and mitigate the effort of drought with a view to contributing to the achievement of sustainable development in affected areas.	
14	**International Covenant on Economic, Social and Cultural Rights**	The International Covenant on Economic, Social and Cultural Rights is a multilateral treaty adopted by the United Nations General Assembly on 16 December 1966 through GA. Resolution 2200A (XXI), and came in force from 3 January 1976. It protects the right to an adequate standard of living adequate, clothing and housing (Article 11), the right to enjoy the 'highest attainable standard' of physical and mental health (Article 12), the right of everyone to education (Article 13), including free and compulsory primary education (Article 14), and the right to take part in cultural life (Article 15).	No
15	**International Covenant on Civil and Political Rights**	The International Covenant on Civil and Political Rights (ICCPR) is a multilateral treaty adopted by the United Nations General Assembly. Resolution 2200A (XXI) on 16 December 1966, and in force from 23 March 1976 in accordance with Article 49 of the covenant. The ICCPR recognizes the inherent dignity of each individual and undertakes to promote conditions within states to allow the enjoyment of civil and political rights, to protect and preserve basic human rights and compelled to take administrative, judicial, and legislative measures in order to protect the rights enshrined in the treaty and to provide an effective remedy.	No
16	**Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides**	The objective of this Convention is to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm and to contribute to their environmentally sound use. This currently covers the following pesticides: 2,4,5-T; aldrin; binpacryl; captafol; chlordane; chlordimeform; chlorobenzilate; DDT; dieldrin; dinitro-ortho-cresol (DNOC) and its salts; dinoseb and its salts and esters; 1,2-dibromoethane (EDB); ethylene dichloride; ethylene oxide; fluoroacetamide; HCH; heptachlor; hexachlorobenzene; lindane; mercury compounds; and pentachlorophenol, plus certain formulations of benomyl, carbofuran and thiram; methamidophos; methyl-parathion; monocrotophos; parathion, and phosphamidon. It also covers the following industrial chemicals: five forms of asbestos (actinolite, anthophyllite, amosite, crocidolite, and tremolite); polybrominated biphenyls (PBBs); polychlorinated biphenyls (PCBs); polychlorinated terphenyls (PCTs);	Applicable

S. No	International Treaties	Objectives of Treaties	Applicability
		tetraethyl lead; tetramethyl lead; and tris (2,3 dibromopropyl) phosphate	
17	**Convention on the Rights of the Child**	The Convention on the Rights of the Child and consists of 41 articles. It sets out the civil, political, economic, social, health, and cultural rights of children. The Convention defines a child as any human being under the age of eighteen. Considering that the child should be fully prepared to live an individual life in society, and brought up in the spirit of the ideals proclaimed in the Charter of the United Nations, and in particular in the spirit of peace, dignity, tolerance, freedom, equality and solidarity.	No
18	**The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW)**	The Convention on the Elimination of all Forms of Discrimination Against Women is an international treaty adopted in 1979 by the United Nations General Assembly. Described as an international bill of rights for women, it was instituted on 3 September 198. It is dibromo propyl an international legal instrument that requires countries to eliminate discrimination against women throughout their life cycle and in all areas and promotes women's equal rights. It is often described as the international bill of rights for women.	Yes
19	**Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides**	The objective of this Convention is to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals, pesticides in order to protect human health and the environment from potential harm and to contribute to their environmentally sound use.	No
20	**Convention for Safeguarding the Intangible Cultural Heritage**	The Convention of the Safeguarding of the Intangible Cultural Heritage was adopted by UNESCO in 2003 in order to promote the identification, protection, and safeguarding of natural cultural heritage. The purposes of this Convention are: (a) to safeguard the intangible cultural heritage; (b) to ensure respect for the intangible cultural heritage of the communities, groups, and individuals concerned; (c) to raise awareness at the local, national and international levels of the importance of the intangible cultural heritage, and of ensuring mutual appreciation thereof; (d) to provide for international cooperation and assistance.	No

2.4 ILO Conventions – Ratifications for Pakistan

Pakistan has ratified 08 fundamental and 26 technical ILO conventions in which the following are relevant to the sub-project and summarized in the following table:

Table 4: ILO Conventions

S. No	ILO Conventions– Rectification for Pakistan	Objectives	Applicability
1	**C029 - Forced Labor Convention, 1930 (No. 29)**	Article 1 of the convention states each member undertakes to suppress the use of forced or compulsory labor in all its forms within the shortest possible period. Article 2 of the convention states that the term forced or compulsory labor shall mean all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily.	Yes
2	**C111 - Discrimination (Employment and Occupation) Convention, 1958 (No. 111)**	For the purpose of this Convention, discrimination includes any distinction, exclusion or preference made on the basis of race, color, sex, religion, political opinion, national extraction or social origin, which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation.	Yes
3	**C138 - Minimum Age Convention, 1973 (No. 138)**	Article 1 of the convention states that Each Member which ratifies this Convention shall specify, in a declaration appended to its ratification, minimum age for admission to employment or work within its territory and on means of transport registered in its territory; subject to Articles 4 to 8 of this Convention, no one under that age shall be admitted to employment or work in any occupation.	Yes
4	**C001 - Hours of Work (Industry) Convention, 1919 (No. 1)**	The term industrial undertaking under this convention includes (c) construction, reconstruction, maintenance, repair, alteration, or demolition of any building, railway, tramway, harbor, dock, pier, canal, inland waterway, road, tunnel, bridge, viaduct, sewer, drain, well, telegraphic or telephonic installation, electrical undertaking, gas work, waterworks or other work of construction, as well as the preparation for or laying the foundations of any such work or structure; Article 2 of the Convention states that the working hours of persons employed in any public or private industrial undertaking or in any branch thereof, other than an undertaking in which only members of the same family are employed, shall not exceed eight in the day and forty-eight in the week. The limit of hours of work prescribed in Article 2 may be exceeded in case of an accident, actual or threatened, or in case of urgent work to be done to machinery or plant, or in case of "force majeure", but only so far as may be necessary to avoid serious interference with the ordinary working of the undertaking.	Yes

3 Description of Engineering Activities

This chapter provides the details of the engineering activities, construction schedule, and various construction phase activities to be executed at the Sehan FIS (Package 1, 2 & 3).

3.1 Engineering Activities/Interventions

The work activities under these three packages include the construction of Sehan weir, head regulators, under sluice, box culverts, fall structures, guide bunds, road crossing structures, Sehan channel, and two distributary minors. The details of engineering activities to be carried out at each package are provided in the table below[12].

Table 5: List of Construction Activities

S. No	Activities	List of Associated Construction Activities
1	Pre-Construction –Activities (All Packages)	• A joint survey of sites with PMU and PSIA Consultants. • Selection of suitable site for the establishment of contractor's camp. One main camp shall be constructed under each package. • Construction of contractor camp. • Relevant staff deployment for the start of Work. • Mobilization of machinery and equipment.
Sehan FIS (Package-1)		
1	Construction of Sehan Weir and Under Sluice at Sehan River	• Site clearance/bush Clearance and stripping • Construction of temporary diversion channel • Excavation for construction works, • Sheet piling • Dewatering activity and sheet piling • Construction of foundation and guide walls • Concreting for foundation • Concreting of Stilling Basin • Installation of Hydro mechanical Components (Stop-logs, Gates, etc) • Concreting works for the foundation, stilling basin, and retaining walls
2	Construction of Guide Bunds at Sehan River	• Bush clearance and excavation for guide bunds.

[12] Bidding and contract document

S. No	Activities	List of Associated Construction Activities
		• Construction of guide bunds on the downstream side of the weir on both sides • Stone pitching and armoring • Trimming activity of the river banks
03	Sehan Channel	• Construction of Sehan channel (4000 meters (12,123 ft) in length from RD 00 to 4+000 under package-1. • Construction of 09 Box Culverts at RD 0+650, 1+002, 1+550,1+800, 2+340, 2+455, 2+600, 3+250 and 3+610 In addition, the following associated work activities shall be carried out: - Bush clearance and stripping of the channel footprint Excavation of design channel prism - Earthwork for channel embankment - Excavation works - Construction of structure & fixing of steelworks - Preparation and placing of concrete
4	Main Head Regulator at Sehan River	• Construction of temporary diversion channel • Bush clearance and stripping of the channel footprint • De-watering activities • Sheet piling • Steelworks • Installation of gates and gantry • Preparation and placing of concrete • Concreting of Retaining Walls • Finishing works
Sehan FIS Package-2		
1	Sehan Channel	- Construction of Sehan channel 3,600 meters (11,811 ft) in length from RD 4+100 to RD 7+600 under package-2. - Construction of Head Regulator at RD 5+50 - Construction of Box Culvert at RD 4+200 - Construction of 03 Fall Structures at RD 6+300, 6+500 and 6+700 - Construction of road Crossing Structure at RD 7+100 In addition, the following associated work activities shall be carried out: - Bush clearance and stripping of the channel footprint - Cutting of 145 trees at Sehan channel - Excavation as per design prism of the channel - Earthwork for channel embankment Excavation of design channel prism - Sheet piling and steel works

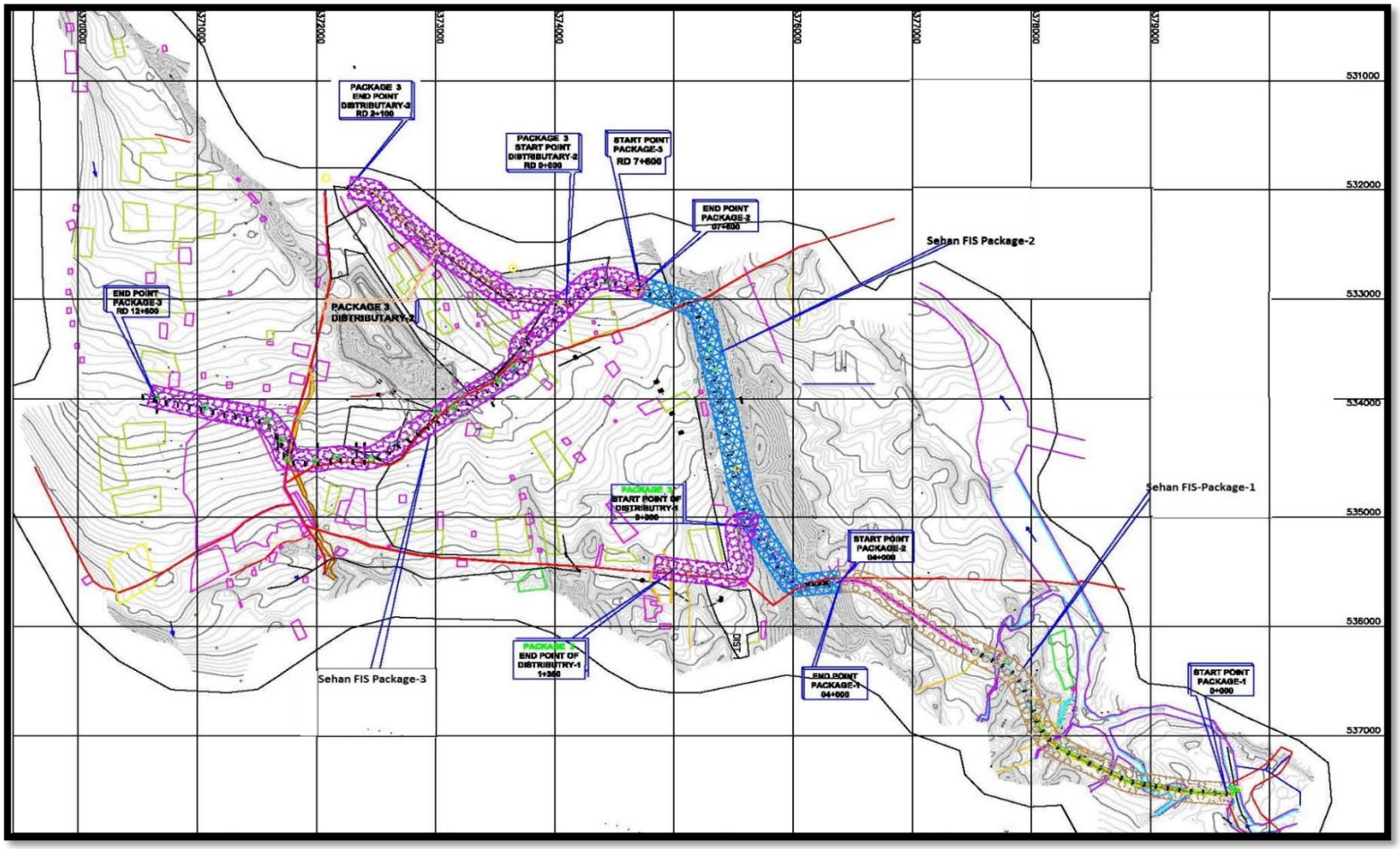
S. No	Activities	List of Associated Construction Activities
		- Installation of gates and gantry - Preparation and placing of concrete - Concreting of Retaining Walls
Sehan FIS (Package-3)		
2	Sehan Channel	• Construction of Sehan channel 5,000 meters (16,404 ft) from RD 7+700 to RD 12+600 (tail end) • Construction of head regulator at RD 8+350 • Construction of 03 fall structures at RD 8+800, RD 11+400, and 11+800. • Construction of 07 Outlets at RD 10+600, RD 10+670, RD 11+000, RD 11+250, RD 11+270, RD 11+450, and RD 12+600. • Construction of 07 Box Culverts at RD 10+600, RD 10+670, RD 11+000, RD 11+250, RD 11+270, RD 11+450, and RD 12+600 • Construction of 03 road crossing structures at RD 9+000, RD 9+900, and RD 11+250 In addition, the following associated work activities shall be carried out: - Bush clearance and stripping of the channel footprint - Cutting of 174 number of trees - Excavation of design prism of the channel - Earthwork for channel embankment Excavation of design channel prism - Sheet piling and steelworks - Installation of gates and gantry - Preparation and placing of concrete - Concreting of Retaining Walls
3	Distributary Minor No 1 at RD 5+050 of Sehan Channel	• Construction of distributary minor from 0+000 (head) to RD 1+300 (tail end) • Construction of 04 Fall Structures at RD 0+100, 0+200, 0+700 and 1+000 In addition, the following associated work activities shall be carried out: - Bush clearance and stripping of the channel footprint - Cutting of 64 number of trees - Excavation as per design prism of the distributary minors - Earthwork for distributary minor Excavation of design distributary minor - Sheet piling and steelworks - Installation of gates and gantry - Preparation and placing of concrete - Concreting of Retaining Walls - Earthwork Backfilling for connection of structure to the road.
4	Distributary Minor 2 at RD 8+350 of Sehan Channel	- Construction of distributary minor from RD 0+000 (head) to RD 2+100 (tail end)

S. No	Activities	List of Associated Construction Activities
		- Construction of 03 Fall Structures RD 1+000, 1+500, and 2+000. In addition, the following associated work activities shall be carried out: - Bush clearance and stripping of the channel footprint - Cutting of 12 number of trees - Excavation as per design prism of the distributary minors - Earthwork for distributary embankment Excavation of design distributary - Sheet piling and steelworks - Installation of gates and gantry - Preparation and placing of concrete - Concreting of Retaining Walls

Source: Socio-economic survey by PMU/PSIAC teams

The following figure of the general layout plan provides the location of the channels, distributary minors and hydraulic structures to be constructed Sehan FIS (Package 1, 2 & 3).

Figure 3:General Layout Plan of Sehan Flood Irrigation Scheme



3.2 Construction Phase Activities

3.2.1 Construction of Sehan Channel

A new Sehan channel of 12,600 meters (3,841.4 ft) in length will be constructed under this scheme. The channel will be connected with the Sehan Head Regulator at RD 0+000 (head) to intake floodwater from the Sehan River. The designed width of the channel is 10.65 meters (35 ft), while the channel will have the capacity to discharge 500 cubic feet per second (CFS) of water. The entire channel will be constructed in three different packages, as detailed below:

Table 6: The Construction of Sehan Channel

S No	**Sehan Channel**	**Length (m)**	**RDs**
1	Package-1	4000 meters	RD 00 to 4+000
2	Package-2	3600 meters	RD 4+100 to RD 7+600
3	Package-3	5000 meters	RD 7+700 to RD 12+600 (tail end)
Total Length and RDs		12,600 meters	12+600

3.2.2 Construction of Distributary Minor (1&2)

Under Package-3 of this scheme, two distributary minors will be constructed and will be further connected with the sehan channel to intake water during floods. The proposed designed bed width of distributary minor 1 is 3.5 meters (11.4 ft) and will have the capacity to discharge 174 CFS of water. While second distributary minor will be 2 meters (6.5 ft) wide in bed width and will have the capacity to discharge 87 CFS of water. The further details of these distributary minors are provided in the table below:

Table 7: The Details of Distributary Minors

S. No	Name of Distributary Minors	Location of Construction	Length in meters (ft)
1	Distributary Minor-1	RD 5+050 of Sehan Channel	1,300 (4,264 ft)
2	Distributary Minor-2	RD 8+350 of Sehan Channel	2,100 (6,888 ft)

3.2.3 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 8: List of Construction Material Required

Concrete (Cum)*				**Steel**	**Spawl**	**Stone Pitching**	**Jungle Clearance**	**Exc. in Soil**	**Exc in Rock**	**Earthwork**
Plum Concrete	**C-13**	**C-21**	**C-25**							
Cu.m	Cu.m	Cu.m	Cu.m	Tonne	Cu.m	Cu.m	Sq.m	Cu.m	Cu.m	Cu.m
Sehan FIS Package-1										
5651	628	1085	9376	642	13,424	11,600	193,918	169,611	68,831	359,017

Sehan FIS Package 2										
74	735	1651	4513	334	12,450	8,599	299,172	458,843	370,804	214,492
Sehan FIS Package-3										
74	537	370	4733	403	4,020	4,898	288,791	249,605	127,763	478,446

The following will be the sources of construction material.

i. Earth-fill

Earth-fill will be required for the construction of the temporary diversions, guide bunds, and back-fill. The earth-fill will be obtained from the excavation of the site of the proposed structure site and during the excavation of the sehan channel and distributary minors

ii. Spawl and Stone Pitching

Sprawl is a material used underneath the stone pitching, which is small size stones mixed with sand/silt while stone for pitching consists of rock fragments or boulders. The stone size shall follow the dimension set out in the design drawing.

iii. Cement and Steel

The cement and steel will be purchased from commercial sources.

iv. Concrete Production

The batching plant will be installed by the contractor to produced concrete for the construction works.

It must be ensured by the contractor that the commercial source of purchasing construction material shall be registered with the District Administration and EPA Balochistan following the approval PSIAC engineer.

v. Sand

Sand will be obtained from the commercial quarry or from river bed material. The stone and concrete material will be brought from government-approved quarries and no quarry material shall be acquired from protected areas.

Selection of Quarry

The selection of the commercial quarry sources is primarily dependent on the availability of material nearest to the construction site and in accordance to the contractual requirements. The PSIAC Engineer will visit different material sources to determine which area would have specified material that satisfies the prerequisite requirements for construction. The material available onsite is not homogeneous and after collection grading is required to use in the construction. The potential quarry sites to be proposed under the scheme will be used for mining of sand and gravel (bajri).

The following criteria will be adopted by the PSIAC engineer for the selection of quarry area.

- A field survey will be carried out by the engineer to find a suitable location where the material is present and can fulfil the requirements of the sub-project. The sub-project (P1, P2, and P3) are located on the Sehan river 70 km from Loralai. Sehan river is located in the semi-arid region of Balochistan with an annual average rainfall of 335 mm. A major portion of the rainfall (90 %) occurs from January to Aug each year causing significant floods. Average monthly rainfall in the remaining 04 months varies from 3 mm to 12mm which therefore does not generate significant runoff. As mentioned in the ESIA of the project, Sehan falls under the irrigated command area of NRB. In the scheme area, the flow in the river is found in and after rainfall events. Therefore, the river beds from which the quarry material will be extracted are desertic and with only water available in these seasonally intermittent surface waters/ rivers.
- As per estimates, the quantity of sand required is 9,231 cubic meters. A sufficient quantum of sand is available in the river bed. If we calculate an area of 100 m x2000 m, the total quantity comes out to be 200,000 cubic meters, then it is possible to arrange the quantum of sand (required in very minimum quantity) for this scheme with the depth of 0.5 to 01 m. Since the extraction of required material from the river bed will be only 4.6% from the total calculated area. However, the contractor along with PSIAC and PMU shall jointly assess and identify locations within the above mentioned area (100 m X 2000 m) and choose those locations which cause no or negligible impact on the behaviour of the river. The surface and the excavated area will be restored after use, there will be minimal impact on the river ecology due to this extraction of material as the river in the scheme area is very desertic and based on available hydrological data, the availability of water in the river is during the rainy/flood season.
- The quantity of aggregate/bajri required 18,462 cubic meters. Any other material is not required from the river bed and for the arrangement of gravel material it shall be either from the commercial source or by collecting large boulders through surface scraping from up-lands within a radius of 4 to 12 km of the construction site which will then be crushed in the crusher to produce crushed stone.
- The material is not excavated from the riversides as Mines and Mineral Department[13] does not allow as well as it does not fulfill the required specifications. The contractor will level the excavated material with adjoining material present in that location.

3.2.4 Construction Schedule & Work Plan

The following table provides the details and timeline of pre-construction and construction phase activities to be carried out at all three sub-projects/packages.

[13] All the potential sites are registered with Mines and Minerals Department, Balochistan and contractor (Not the sub-project contractor) pay the royalty on minor minerals per metric ton as per notification No.SOT(MMD)4-1/2017/748-68 issued by Mines and Mineral Development Department, Balochistan. The mines and minerals and license issuing authority have pre conditions and monitoring including NOC from EPA prior to get the license. Under section 16 Mines Act 1923, periodic inspection of mine is carried out to monitor maintain check & balance on mines and indicate the discrepancies in precautionary measures in all regards and for safety of mine workers. The license covers all sitespecific legal provisions regarding environment, site condition and area demarcation In addition, Minor Mineral Concession Rules 2000 stated under part VIII of Balochistan Mineral & Mines Rules 2002 are applied on the potential quarry sites. Wherein it is also obligatory for the applicant to get NOC from EPA for safe working environment and protection, conservation and rehabilitation of the environment for the promotion of sustainable activities at the site.

Table 9: Construction Work Plan/Schedule

S. No	Activities	Duration (in number of days)
Sehan FIS Package-1		
1	Pre-Construction Activities	90 days
2	Sehan Weir	395 days
3	Hydraulic Structures (Head Regulators and Under Sluice and Road Culverts)	270 days
4	Guide Bund (1150 m long)	210 days
5	Sehan (4000 m long)	365 days
Sehan FIS Package-2		
1	Pre-Construction Activities	90 days
2	Sehan Channel (3600 m long)	395 days
3	Head Regulators	210 days
4	Hydraulic Structures (Fall Structures, Culverts, Road Crossings)	305 days
Sehan FIS Package -3		
1	Pre-Construction Activities	90 days
2	Sehan Channel 5000 meter long	305 days
3	Distributary Minor 1	180 days
4	Distributary Minor 2	240 days
5	Head Regulator	120 days
6	Hydraulic Structures (Fall Structures, Culverts, Road Crossings)	305 days

Figure 4:Work Plan for Executing Engineering Activities (Sehan FIS Package-1)

			2021												2022					
S. No	Activity	Timeline	Q1			Q2			Q3			Q4			Q1			Q2		
1	**Pre-Construction Activities**																			
1.1	Site Survey and Joint Demarcation of Sites with PMU and PSIA teams	1month																		
1.2	Selection of suitable site for establishment of camp	1 month																		
1.3	Establishment of Camp	3 month																		
1.4	Relevant Staff Deputation for start of works	2 month																		
1.5	Mobilization of Machinery and Equipment	3 month																		
2.0	**Construction of Works for Sehan Weir, Head Regulator and Under Sluice**	13 months																		
2.1	Site Clearing and Preparation																			
2.2	Diversion Works and Care of Water																			
2.3	Construction of Head Regulator																			
2.4	Construction of Sehan Weir and Under Sluice																			
2.5	Construction of Guide Bund																			
2.6	Construction of Stone Pitching and Protection Works																			
3.0	**Construction of Works for Main Channel**	16 months																		
3.1	Site Clearing and Preparation																			
3.2	Diversion Works and Care of Water																			
3.3	Earthwork for construction of Channel Embankment																			
3.4	Construction of Channel Prism by Excavation																			
3.5	Construction of Box Culverts																			

Figure 5:Work Plan for Executing Engineering Activities (Sehan FIS Package-2)

S. No	Activity	Timeline	2021				2022	
			Q1	Q2	Q3	Q4	Q1	
1	**Pre-Construction Activities**							
1.1	Site Survey and Joint Demarcation of Sites with PMU and project Consultants	1month						
1.2	Selection of suitable site for establishment of camp	1 month						
1.3	Establishment of Camp	3 month						
1.4	Relevant Staff Deputation for start of works	2 month						
1.5	Mobilization of Machinery and Equipment	3 month						
2	**CONSTRUCTION ACTIVITIES**							
2.1	**Construction of Works for Main Canal (RD 4+000 to RD 7+600)**	14 months						
2.2	Site Clearing and Preparation							
2.3	Diversion Works and Care of Water							
2.4	Excavation of Main Canal in Soil							
2.5	Excavation of Main Canal in Rock							
2.6	Temporary Protection Works							
2.7	Earthwork for Construction of Embankments							
2.8	Excavation of Channel Prism by Excavation							
3.0	**Construction of Works for Hydraulic Structures**	13 months						
3.1	Site Clearing and Preparation							
3.1	Diversion Works and Care of Water							
3.3	Construction of Head Regulator							
3.4	Construction of Road Crossing Structure							
3.5	Construction of Culvert							
3.6	Construction of Falll Structures							

Figure 6:Work Plan for Executing Engineering Activities (Sehan FIS Package-3)

S. No	Activity	Timeline	2021				2022
			Q1	Q2	Q3	Q4	Q1
1	**Pre-Construction Activities**						
1.1	Site Survey and Joint Demarcation of Sites with PMU and project Consultants	1month					
1.2	Selection of suitable site for establishment of camp	1 month					
1.3	Establishment of Camp	3 month					
1.4	Relevant Staff Deputation for start of works	2 month					
1.5	Mobilization of Machinery and Equipment	3 month					
2	**Construction Activities**						
2.1	**Construction of Works for Main Canal (RD 7+600 to RD 12+600)**	14 months					
2.2	Site Clearing and Preparation						
2.3	Diversion Works and Care of Water						
2.4	Excavation of Main Canal						
2.5	Construction of Embankment						
2.6	Construction of Distributary 1						
2.7	Construction of Distributary 2						
3.0	**Construction of Works for Hydraulic Structures**	16 months					
3.1	Site Clearing and Preparation						
3.2	Diversion Works and Care of Water						
3.3	Construction of Head Regulator						
3.4	Construction of Road Crossing Structure						
3.5	Construction of Culvert						
3.6	Construction of Falll Structures						

3.2.5 Permanent Land Needs on Sehan Channel and Two Distributary Minors

In total 39 acres of land has been donated by the farmers for the construction Sehan channel and two distributary minors. From which 30 acres of provided land will be used for the construction main channel. While 09 acres of land obtained will be used for the construction of distributary minor 1 and 2. All permanent land has been donated from the farmers of Mekhtar Town and land needs are met through the VLD process. The current land pattern of donated land is barren and agriculture. In case where there are standing crops, the land will only be taken for construction activity once the crops have been harvested, 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 10: Land Donated from Farmers of Mekhtar Town

S.No	Name of Farmers	Father name	Total Land	Total Obtained Land in Acres (Hectors)	Percentage of total landholding donated
Land Donated for the Construction of Main Sehan Channel					
1	Abdul Qadir	Mahash	29.3	2.09	7
2	Abdullah Jan	Jamal Khan	52.3	3.3	6
3	Meer Gul	Kato	23.8	1.5	6
4	Safar Khan	Gul Baran	30.3	2.1	7
5	Molvi Ibrahim	Muhammad Sharif	22.8	1.6	7
6	Molvi Roz ud Din	Muhammad Sharif	43.2	2.5	6
7	Alam Jan	Fazal Khan	29.8	1.9	6
8	Abdul Hakeem	Abdul Rasool	106.7	3.6	3
9	Khair ud Din	Haji Hassan Khan	60.3	2.4	4
10	Aqal Khan	Malak Haji Alam	53.7	1.6	3
11	Haji Toor	Haji Abdul Kareem	24.4	1.6	7
12	Aqal Khan	Malak Haji Alam	37.5	2.6	7
13	Azad Khan	Labo Khan	24.3	1.4	6
14	Hayat Khan	Mash	35.8	1.8	5
Total				**29.99**	**5.2**
Land Donated for the Construction of Distributaries					
1	Najmuddin	Essa Khan	18.9	1.1	6
2	Abdul Sattar	Lala Mohammad	43.2	2.2	5
3	Shah Wazir	Gohar Jan	20.6	0.9	4
4	Muhammad Din	Haji Masho	11.3	0.6	5
5	Master Saeed Mohammad	Malak Noor Mohammad	29.9	0.9	3
6	Asmat Ullah	Haji Chalai	10.07	0.3	3
7	Haji Kashmir	Fateh Mohammad	23.2	0.7	3

8	Abdul Ahmed	Qadir Jan	20.8	0.7	3
9	Nasrullah	Patas	18	0.4	2
10	Gulee Khan	Bahdur Khan	38.7	1.16	3
Total				**8.96**	**3.8**

3.2.6 Temporary Diversions

There is government land available in the foothills and at the immediate site of the proposed weir site, and a vast area is barren land. Ideally, the temporary diversions may have required only for the works activities that are to be carried out in Sehan River for the construction of weir, head regulator, and under-sluice to divert floodwater without disruption of water supply during floods. This aspect is very much dependent on the contractor's planning that how he will plan his activities during the construction stage, e.g., diversion channels may not be required during the dry season and construction work can proceed without the construction of temporary diversion channel.

While four (04) temporary diversions of the road shall be constructed at RD 4+200, RD 9+000, RD 9+900, and RD 11+250 of the Sehan channel for the construction of road crossing structures and box culverts. These temporary road diversions are required to divert traffic passing through Zhob road towards Mekhtar City, to avoid any disturbance to the commuters.

After completing construction activities all temporary diversion will be removed and the land shall be reinstated into its original condition. The temporary land required should be free from encroachment, economic, and residential use.

3.2.7 Use of Excavated Material

It is estimated that 878,059 cubic meters (31,008,361 cubic feet) of earth material will be excavated during the construction of the Sehan channel, distributary minors, and from structural sites. All the excavated material acquired during excavation shall be reused for the construction of temporary diversion, embankment works, guide bunds, and backfill. While the cleared vegetation material will be reused by the contractor to backfill the abandoned portion of land, or to -close temporary diversions.

3.2.8 Site Access

The contractor shall use the existing roads and Kacha routes (dirt road) to access the main construction sites and main camp from the main Zhob road. During the movement, the contractor will be responsible to manage and make their arrangements to reach their work stations and shall avoid such routes that trespass the local community or settlement. The contractor will also ensure that the mobility and access of the community (residential/economic) is not restricted by the construction activities. The assessment along with mitigation on environmental and social aspects is further provided in Environmental and Social Impact and Mitigations Section 6.

3.2.9 Site Clearance Works

During the earthworks, trees will be felled and vegetation cover will be stripped during the construction of the sehan channel, distributary minors, and its associated hydraulic structures. During the survey 395 number of trees were recorded which are aniticipated to be felled. The species of these trees include: Babur *(Acacia Nilotica),* Ber *(Ziziphus nummularia),* Al-mond *(*Prunus amygdalus). Before the commencement of earthwork activities, the contractor, along with PSIAC 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: Makhai (*Caragana ambigua),* Zarga (*Prunus eburnean),* Sasai (*Erbenus stellate),* Ghuzaira (*Stockia bruchica),* Sandraza (*Lactuca orientalis),* Tarkha (*Artemisia maritima),* Spalmae (*Callotropi sprocera),* Sargara (*Cymbopogon jawarancusa),* Sabba (*Chrysopogon serrulatus),* Washta (*Stipa pennata).*

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 6.2.8.1 and Appendix B shall be implemented by the contractor.

Figure 7:View of tree cover at Sub-project area

Figure 8:Scattered vegetation cover at scheme area

Figure 9:View of land area at proposed road crossing structure site

Figure 10:Another view of trees in scheme area

3.2.10 Labor Requirement

At the peak of construction activity, up to 50 laborers are likely to be employed for the works to be carried out at each sub-project/package. These laborers will be residents on-site for the construction period and in accordance with the contractor's work plan. It is anticipated that approximately 75% of the workforce will be from the sub-project area while some 25% of labor (skilled) will be hired from outside the sub-project area[14]. The mitigation measures given in section 6.3.7.1 will be followed by the contractor. However, women will be also encouraged to work and hired, if interested[15]. It must be completely ensured by the contractor and all project staff that the guideline given in Section 6.2.3.1 on COVID-19 are completely followed at the site.

3.2.11 Use of Machinery and Equipment

It is estimated that the equipment given in the table below shall be required to complete the different sub-project engineering activities. It must be ensured by the contractor that all the required machinery or equipment deputed on site shall be fit for construction activities, i.e., no leakages of fuel or oil.

Table 11: Machinery and Tools/Equipment Required for Earthworks and Civil Work

Machinery Equipment (Estimated Quantity)	Sehan FIS Package-1	Sehan FIS Package-2	Sehan FIS Package-3
Excavator	06	06	06
Dozer	02	02	02
Motor grader	02	01	02

[14] During the implementation phase, the mitigation given in section 6.3.4.1on COVID-19 shall be followed by the contractor and all project staff.

[15] The current cultural norms in the sub-project do not appreciate women working in the construction field.

Machinery Equipment (Estimated Quantity)	Sehan FIS Package-1	Sehan FIS Package-2	Sehan FIS Package-3
Vibratory Rollers	03	02	03
Dump truck	10	04	06
Concrete pump / Transit mixers	04	04	06
Batching Plant	01	01	01
Tractors with various attachments like (blades, loaders, trolleys)	10	06	12
Water Bowser	10	02	03
Electric Generator	04	08	08
Steel bar cutter	12	25	35
Steel bar bender	12	06	6
Concrete vibrator	20	02	02
Welding Machine	10	01	02
Oil tank	04	02	03

Source: Socio-economic survey by PMU/PSIAC teams

3.3 Right of Way (RoW)

The Right of Way (RoW) has been considered as the area along the existing earthen river and where the proposed engineering works are to be carried out. Following the General Drawings of Feasibility Study, the RoW for the Sehan River is 135 meters (1,438 ft approx.) from the centerline on either side.

3.4 Corridor of Impact (CoI)

The corridor of Impact (CoI) is considered the scheme command area of 28,800 acres (11,655 hectors), wherein there could be an impact when the irrigation system is improved and expanded. Therefore, environmental, socio-economic, and other relevant surveys are conducted in this area.

3.5 Establishment of Contractor Camp

3.5.1 Siting of Contractor Camps

The contractor under each package (1, 2 & 3) will establish their one main camp (approx. 10,000 sq. ft) near their sub-project. The contractor is required to make arrangements for the use of the area with the land-owner or the relevant department i.e. irrigation. The contractor may propose the location of the main camp, as per his work methodology, and must meet the requirement of this ESMP and must ensure that the required land is free from encroachment, economic and residential use. The ECOPs guidelines for the construction and management of contractor main camp are given in Table 12, Appendix B shall be implemented accordingly. This main camp-site will be used for the following facilities:

- Material storage
- Workshops
- Material testing laboratory
- Site offices
- Contractors' accommodation
- Labor camp, including welfare facilities such as kitchen and dining room: Labour in this camp may reside overnight and may belong to areas outside the sub-project area.
- Drinking water and sanitation facilities
- Medical facilities
- Sewage disposal system and power generators

The following conditions for contractor camps:

- Locate all construction camps at least 500m (1,640 ft.) away from communities to avoid social conflict overuse of natural resources such as water, and/or to avoid the possible adverse impacts of the presence of construction camps on surrounding/nearby communities.

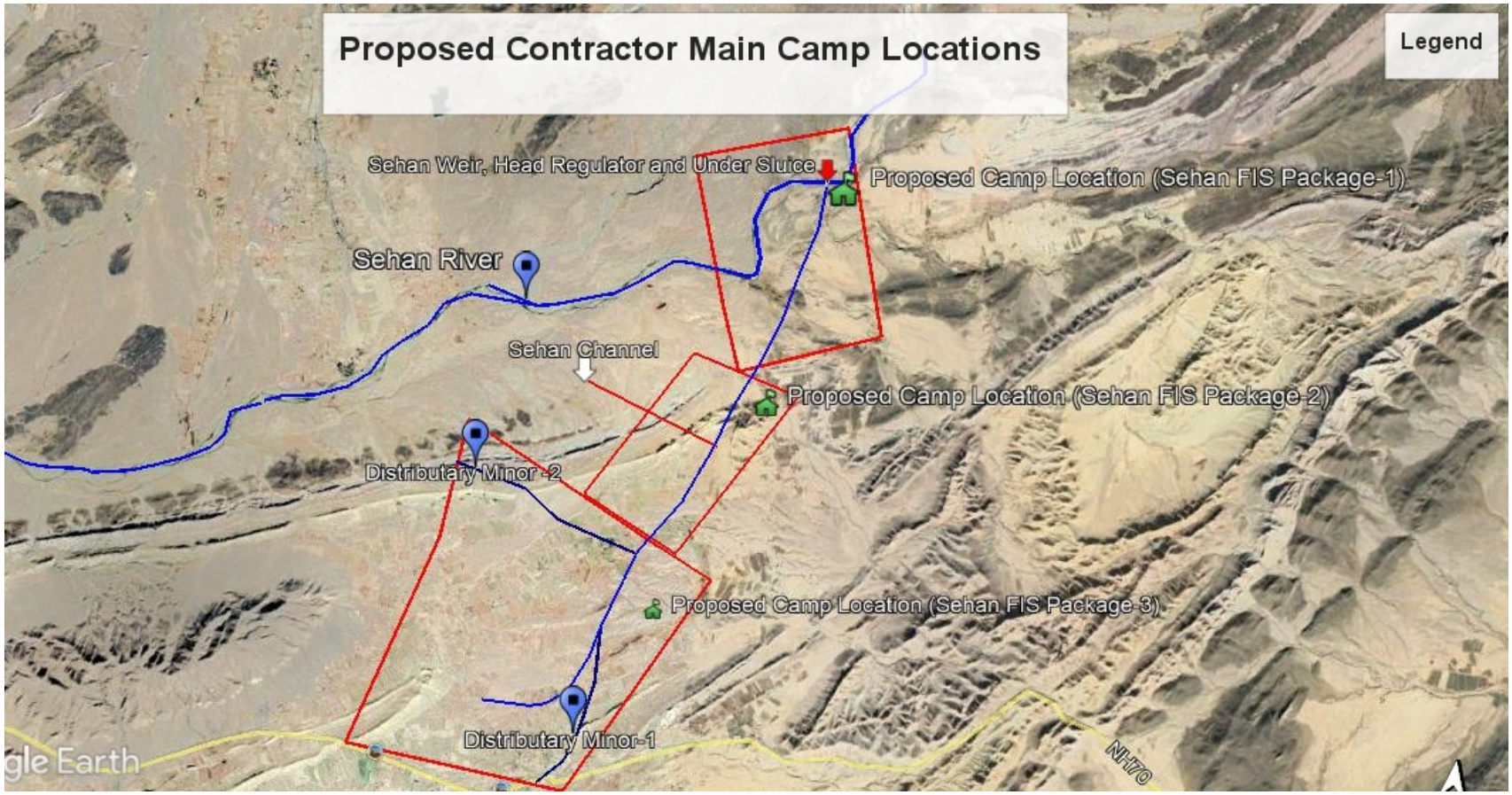
- Where appropriate, the local authorities responsible for health, dispute resolution, religious and security matters will be duly informed regarding the set-up of camp facilities to maintain effective surveillance of public health, social impacts, and security.

- Land required temporarily for the construction and establishment of contractor camp will be organized by and be the responsibility of the contractor.

- The villagers shall be strongly involved in the identification of the camp location.

In case the land is taken from a private individual or public entity the contractor has to sign a temporary lease agreement and will follow the RPF guidelines for meeting land needs. Once, the works are completed, the contractor will return the land to the owner in its original condition with no remnant of waste material, debris, etc.

Figure 11:Proposed Main Camp Location of Each Package



3.5.2 Standards for the Construction of Workers Accommodation

Following the best practices, the main for contractor and labor/workers would follow standards given in the below:

Table 12: General Camp Site Best Practice Guidelines

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 fire-fighting 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 between bed to bed shall be at least 06 feet. •Appropriate protection against heat, cold, damp noise, fire, and disease-carrying animals, in particular insects. •Lighting and electricity supply •Ventilation facility with availability of electricity, fans •Roads and paths •An adequate number of toilets and sanitary fitting 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 of 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 which is separated from living quarters •Provide fuel to the construction camps for their daily purpose use, to discourage them to use fuelwood or other 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 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 doctor on site. •Provide transport facility for the laborers during an emergency to be transported to the nearest hospitals •Provide HIV awareness programming, including STI (sexually transmitted infections) and HIV information, education, and communication for all workers regularly.

Activity	Guidelines
	• No handshakes and hugs. • The disinfection of all camp areas shall be carried out on regular basis. • Items like tissue papers, surgical masks, 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 for several times. • Use a face mask and latex gloves • Install alcohol-based sanitizer dispensers (sensor-based) at each room and kitchen area. Make sure these dispensers are regularly refilled. The further guidelines and SOPs regarding Covid-19 shall be followed, as given in section 6.2.3.1 and Appendix I.
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 (Private security guards) and enclosures to prevent unauthorized entry into the camp area.
Drainage	• Regularly inspect and maintain drains • Provide 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 stormwater drainage capacity to prevent the accumulation of stagnant water following heavy rains • Build new shallow v drainage lines as required for wastewater/rainwater run off to the nearby recipient water body • The presence of stagnant water is a factor in the proliferation of potential disease vectors such as mosquitoes, flies, etc., and must be avoided and away from campsites and the community.
Site Restoration	• Backfill waste and sewage pits • Consider seeding the area to provide an initial protective canopy • Give prior notice to the laborers before demolishing their camps/units • Maintain the noise levels within the national standards during demolition activities • Reuse the camp material to the maximum extent. Dispose of remaining debris at the designated waste disposal site. • To restore the site to its original condition or an agreed condition with the landowner defined before the commencement of the works (in writing). • Dismantle and remove from the site all facilities established within the construction camp, including the perimeter fence and lockable gates after the construction work. • Decommission and fill drinking water wells (unless otherwise arranged with the landowner) • If possible, dismantle camps in phases as the work decreases (do not wait for the completion of the entire work)

3.5.3 Storage of Materials

The materials to be stored at construction sites will include cement, sand, steel, crush, and other chemical drums (i.e. Admixtures), etc. All these materials shall be kept as per their nature or type and will store in separate compartments in accordance with their nature at each camp. The further ECOPs guideline on the storage of materials are provided in table 4, Appendix B shall be implemented accordingly.

3.5.4 Waste Management & Disposal

The main types of waste expected to be generated and requiring disposal include:

- Waste generated during construction;
- Fuel, oils, and chemicals;
- Sewage;
- Campsite waste;
- Medical waste;
- Demolition waste;
- Packing waste; and,
- Excess construction material.

Domestic waste and construction waste will be the main types of waste generated from camps and construction activities. Adopt a source waste segregation methodology and installed separate bins using the 4Rs principle (Reduce, Recycle, Reuse, and Recovery). The following disposal techniques shall be adopted:

Table 13: Waste Management collection and disposal Techniques

Activity	Best Practice
Generation of Construction waste	• Implement resource conservation, and encourage staff (through training) to reduce waste, reuse waste and recycle waste wherever possible
Disposal of Covid Waste	• All waste such as gloves, face mask, tissue papers shall be disposed of in already placed separate top covered waste bins in different identified areas in the camp and as per contractor waste management and disposal plan. • These waste bins shall be marked with Covid-19 waste. • All Covid-19 waste shall be collected with appropriate safety measures and be transported to the burning pit away from the campsite and community.
Disposal of bio-degradable domestic waste	• Collect all bio-degradable domestic camp waste and dispose of at the designated landfill area or compost area
Disposal of non-biodegradable waste (non-recyclable)	• Dispose of in a landfill. • Do not burn materials which may lead to the release of toxic or hazardous substances (see NEQS)
Disposal of recyclable waste	• Sell recyclable waste to local vendors
Generation of sanitary waste	• Provide latrines at all camps • Prohibits staff from fouling the site
Collection of domestic waste	• Provide garbage bins, at a radius of 50ft for the collection of domestic camp waste • Arrange for regular collection of camp waste and transfer to a storage area/disposal

Activity	Best Practice
	• Collect non-biodegradable waste separately and dispose of at licensed waste disposal area • Enforce the use of garbage bins and prevent littering of the site
Disposal of sanitary waste	• Treat sanitary waste with septic tanks at main camps • Dispose of sanitary waste through burial at temporary and subcamps
Incineration of waste on-site	• No fire is allowed in open. • Do not burn materials such as plastics and polyethylene which may lead to the release of toxic or hazardous substances. • Collected and disposed of the waste in municipal waste dumping points.
Generation of construction waste	• Reduce construction waste by reusing waste as a fill material (before testing to confirm the suitability of material)
Siting landfill	• Site landfill in an area where groundwater is low • If possible and their base of the landfill is highly permeable, line the landfill base with an impervious layer (such as clay) to prevent groundwater contamination from leachate. • Locate 500m away from residences • Provide fences and secure landfill area to prevent unauthorized access
Collection of construction waste	• Collect construction waste separately from domestic waste • Collect and remove all construction waste from the project area
Disposal of construction waste	• Reuse material as fill material or sell to local vendors • Sell or reuse gates removed from structures • Treat construction wastes water and dispose of after treatment • Do not burn materials which may lead to the release of toxic or hazardous substances
Disposal of packaging	• Request suppliers to minimize packaging where practical • Recycle or incinerate in burn pit or incinerator • Do not burn materials which may lead to the release of toxic or hazardous substances
Disposal of medical waste	• All the medical waste shall be disposed of in burial pits. • The burial site shall be identified away from community residents and camps sites. • The burial site shall be identified on the barren land.
Disposal of hazardous waste (fuel, oils, admixture chemicals, batteries)	• Handover to specialized and certified disposal contractor

Further details on the best practices of waste management and disposal are provided in table 3, Appendix B.

3.5.5 Water Supply

During construction works, water will be required for both construction activities and consumption by all project staff. During the testing of groundwater quality, it is found that direct consumption of groundwater is not suitable for drinking as the level of biological contamination (*Total Coliform, Fecal Coliforms, Escherichia Coli* (E-Coli)) were found above the permissible limits. Therefore, the contractor shall make alternative arrangements for water supply (drinking) as well as test the quality of water supply before consumption. Further guidelines of ECOPs on water resource management are provided in Table 1, Appendix B shall be implemented accordingly.

The community is made aware of and will be further consulted regarding all water supply requirements and arrangements through the contractor's community liaison officer. It will be ensured the community's water supply is not compromised or negatively impacted and requisite mitigation measures (if required) will be set in place.

4 Environmental Baseline

This chapter provides the details of the physical and biological environment present in the Sehan Flood Irrigation Scheme. The description of the geology, climate, temperature, air quality, and groundwater quality are presented in this chapter. To establish the baseline conditions, samples of ambient air quality, noise, soil, and water were collected and are reflected here. The primary data was collected for baseline environmental monitoring (air, noise, water, and soil), socio-economic baseline, and the public consultation, while the secondary data was collected for climate, flood, rainfall, and topography. Biological baseline data was collected through literature review and field confirmation.

4.1 Physical Environment

The baseline environmental monitoring (air, noise, water, and soil) for the scheme area were collected as primary data. In this connection, EHS Services JV Ever Green Environment (EGE) Laboratory, Karachi (Certificate of Conducting Tests is provided in Appendix J) was hired for data collection and testing. The ambient air quality and noise quality was tested. The table below presents the name of the locations where monitoring was conducted and the number of samples;

Table 14: Baseline Sampling

Ambient Air/ Noise/Water/and Soil				
Location	**Ambient Air**	**Noise**	**Water Sample**	**Soil Sample**
Sehan FIS	02	02	04	02

Source: Baseline environmental monitoring conducted through EHS JV EGE Laboratory, Karachi

4.1.1 Water Resources

This area falls under the flood irrigated commands of the Nari River Basin and no perennial water flow reaches here. Therefore, the communities living in the Sehan FIS are dependent on rain-fed water, spate (flood) irrigation water, and groundwater resources. While groundwater is the main source of water for livestock and domestic use. The people living in the area use hand pumps, tube wells to extract groundwater resources. The water is fetched from wells through the use of ropes attached to the pulleys, pulled out either manually or mechanically to meet their domestic needs. For the cultivation of crops, the Sailaba (flood irrigated) and Khushkaba (rainfed) farming are the two traditional water harvesting systems in the area. The Sailaba is based on spate irrigation while Khushkaba is dependent on runoff harvested from adjacent slopes and the rainfall.

As the contractor camps will be constructed at least 500m (1,640 ft.) away from Mekhtar Town, therefore, alternative arrangements adjacent to the camp area shall be required by installing tube wells or hand pumps for the supply of water. Thus, the use of existing water resources which are in use of local community is not possible and water resources of the local community will not be depleted by the contractor.

4.1.2 Water Quality

To check the water quality in the scheme area, 04 samples (02 SW and 02 GW) were collected from Sehan River and Mekhtar Town. These samples were examined for physical, biological, and chemical parameters and accordingly were compared with the NDWQs. During the comparison, it is assessed that microbiological results *total coliform, fecal coliform, escherichia coli,* were found above the permissible limit in all surface and groundwater samples while results of other physical and chemical were within the permissible limits. The microbiological contamination is due to the non-availability of the sanitation system, and direct discharge of sewerage waste into open surfaces which deteriorates water quality through continuous leaching. The results of biological parameters of ground and surface water found high in all samples are presented in the table below whereas the complete results are presented in Appendix K.

The ground and surface water quality is already deteriorated in the scheme area thus proposed interventions will not have a further negative impact on the existing water quality, as the mitigation measures proposed in section 6.2.9.1 will be adopted.

Table 15: Water Quality Sample Results

S.No	Parameters	NDWQs Limits/Units	Upstream	Downstream
Mekhtar City (Ground Water)-1				
Total Coliform		0 Cfu/100 ml	196	N/A
Fecal Coliforms		0 Cfu/100	105	
Escherichia Coli (E-Coli)		0 Cfu/100	35	
Mekhtar City (Ground Water)-2				
Fecal Coliforms		0 Cfu/100	193	N/A
Escherichia Coli (E-Coli)		0 Cfu/100	101	
Fecal Coliforms		0 Cfu/100	32	
Sehan River (Surface Water)				
Total Coliform		0 Cfu/100 ml	213	232
Fecal Coliforms		0 Cfu/100	134	156
Escherichia Coli (E-Coli)		0 Cfu/100	68	72

Source: Baseline environmental monitoring conducted through EHS JV EGE Laboratory, Karachi

4.1.3 Ambient Air Quality

The baseline study of ambient air quality has been carried at two points at Sehan Weir and Mekhtar city (adjacent to NH-70 highway). The pollutants monitored were sulfur dioxide, nitric oxide, nitrogen oxides, carbon monoxide, total suspended particulate, particulate matter (PM10), and lead. The results of these pollutant concentrations were compared with NEQs limit and WHO (World Bank Group IFC) guidelines. The finding and the comparison showed that the pollutant concentrations are within the permissible limit which reflects that the ambient air quality is very good, as no industrial activity or heavy traffic is passing by the sub-project locations. While an only major source of pollutants is from the traffic movement on the Zhob Road (NH-70 highway) crossing through the Sehan FIS area, resulting in localized peaks in emissions.

The construction phase activities may decline ambient air quality due to the various activities i.e. movement of machinery and project vehicles on unpaved/katacha routes, use of diesel generators and batching plant, excavations, etc. However, it will be maintained by implementing the mitigation set out in sections 6.2.4.1

and 6.2.5.1, then the adverse impact shall remain low adverse during the entire sub-project duration. The finding of each location is provided in the below table.

Table 16: Ambient Air Quality Sampling

Pollutants Parameters	Minimum µg/m^3	Maximum µg/m^3	Average µg/m^3	NEQs Limit	WHO Limits
Mekhtar City (adjacent to NH-70 highway)					
Sulfur Dioxide (SO2)	16.6	22.3	19.4	120 µg/m^3	125 µg/m^3
Nitric Oxide	2.2	3.6	2.9	120 µg/m^3	Not Available
Nitrogen oxides (NO_2)	20.7	33.1	26.9	120 µg/m^3	200 µg/m^3
Carbon Monoxide (CO)	1.8	2.3	2.0	5 mg/m^3	Not Available
Total Suspended Particulate (TSP)	314.0	365.0	339.5	500 µg/m^3	Not Available
Particulate Matter (PM10)	101.0	121.0	111.0	150 µg/m^3	150 µg/m^3
Lead	Not Detected			50 µg/m^3	Not Available
Sehan Weir Area					
Sulfur Dioxide (SO2)	15.2	24.0	19.6	120 µg/m^3	125 µg/m^3
Nitric Oxide	2.0	3.3	2.6	120 µg/m^3	Not Available
Nitrogen oxides (NO_2)	18.1	25.0	21.5	120 µg/m^3	200 µg/m^3
Carbon Monoxide (CO)	1.70	2.30	2.0	5 mg/m^3	Not Available
Total Suspended Particulate (TSP)	333.0	374.0	353.5	500 µg/m^3	Not Available
Particulate Matter (PM10)	95.0	111.0	103	150 µg/m^3	150 µg/m^3
Lead	Not Detected			50 µg/m^3	Not Available

Source: Baseline environmental monitoring conducted through EHS JV EGE Laboratory, Karachi

4.1.4 Noise Level

The 24hrs of monitoring of noise level was carried out separately similarly, to the result of ambient air quality monitoring, there is a direct correlation between noise levels and the volume of traffic passing by. The maximum average noise level recorded during the day time was 65dB, while the maximum average noise level recorded during night time was 56db. It is evaluated that the noise levels recorded are below the permissible limits of NEQs. While noise pollution will be generated from increased traffic along haulage routes and various construction activities (i.e. sheet piling, use of generators, and batching plant), and by implementing the mitigations set out in section 6.2.7.1 the impact shall be low adverse. The results of noise measurement at the monitoring sites are summarized in the following table:

Table 17: Noise Level Monitoring

Location	Minimum dB	Maximum dB	Average dB	Limits
Day				
Mekhtar Town (adjacent to NH-70 highway)	50	70	60	65 dB Day time as per NEQS (March 2010)
Sehan Weir Area	60	70	65	
Night				

Mekhtar Town (adjacent to NH-70 highway)	43	65	54	
Sehan Weir Area	47	65	56	

Source: Baseline environmental monitoring conducted through EHS JV EGE Laboratory, Karachi

4.1.5 Climate

The climate of the Sehan scheme area is semi-arid and is elevated at 1,372-2,200 m (4501-7217 ft) above sea level. It falls under the "warm summer and cool winter" temperature region. The summer remains warm with mean temperatures ranging from 26 to 31°C. While June is the hottest month with mean maximum temperatures exceed 37°C. The winter season is longer than summer and it lasts for about 6 months (October-March). The mean annual rainfall recorded is 335 mm[16]. There shall be no impact on the climate of the area, as no anthropogenic activities are proposed during the construction or operation phase of the scheme, as the proposed sub-project only aims to improve the irrigation system of the area.

Table 18: Climatic Conditions

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Record high °C (°F)	11.9 (53.42)	16.1 (61.00)	20.4 (68.72)	25.6 (78.17)	33.6 (92.48)	37.4 (99.32)	35.5 (96.00)	36.2 (97.16)	33.2 (91.76)	28.1 (82.58)	25.8 (78.44)	16.1 (61.00)
Record low °C (°F)	-0.5 (31.10)	2.3 (36.14)	6.6 (43.88)	10.9 (51.62)	18.4 (65.12)	23.2 (73.76)	23.1 (73.58)	23.1 (73.58)	18.7 (65.66)	12.3 (54.14)	7.0 (44.60)	0.6 (33.08)
Average precipitation mm (inches)	17.84	20.13	38.16	36.45	16.00	25.46	98.04	52.32	12.76	3.18	3.05	11.11

During the baseline monitoring, the data on temperature and humidity levels were recorded from the scheme location. The means levels of these are provided in the table below.

Table 19: Average Temperature and Humidity Level

Locations	Average Temperature ^{0}C	Average Humidity %
Sehan FIS	27.7	78.3%

Source: Baseline environmental monitoring conducted through EHS JV EGE Laboratory, Karachi

4.1.6 Geo-physical Layout

The Nari River Basin is a groundwater deficit basin having considerable intensive agriculture, a fairly large population, and comprising of major cities of the province. The river debouches into Kachhi plains along with many other hill torrents. It covers around 20 percent of Balochistan, making it the largest river basin in the province and hydrologically the most endowed river basin. About 61% of the river flow occurs during July and August which sometimes causes severe flood-like situations in the downstream areas of the river basin. By implementing this scheme the geo-physical layout of the area will not be disturbed or impacted, therefore, there is no impact anticipated area.

[16] Feasibility and Design Study Report Sehan FIS (Volume-1)

4.1.7 Topography

The sub-project is physio-graphically divided into mountain ranges, piedmont plains and valley floor, and different geological formations. The rocks consisted of limestone, calcareous, sandstone, shale, and conglomerates of various ages while the piedmont area is constituted from parent material derived from surrounding hills or rocky areas. The alluvial deposits in the central and lower parts of the area consist of layers of clay, gravel, silt, sand, or an admixture of these materials. The unconsolidated deposits occur in the form of beds, layers, and irregular bodies[17].

The soil quality analysis of the Sehan FIS was also carried out of pollutants/chemicals and laboratory measurements of organochlorine pesticides. During the testing, it is found that the level of pollutants (cadmium, chromium-trivalent and hexavalent, copper, mercury, lead, nickel, zinc, and arsenic) and pesticides (Organochlorine) are below the permissible limits[18]. Furthermore, the sub-project activities will not cause any topography changes, as the activities are only proposed in the Sehan River providing ultimate benefits to the command area of 28,800 acres (11,655 hectors).

4.1.8 Floods

The floods in the Sehan scheme area have always been a major concern and at the same time, people of the area are dependent upon rain-fed and flood water. The farmers continue to employ inefficient agricultural practices such as Khushkaba farming despite the forecasts. Rainfall and heavy downpours begin from July to August and cause an uncontrolled flow of floodwater resulting in damage to crops and infrastructure. The proposed activities in the scheme area will overall have a positive impact in the command area of scheme, as the damages caused by the floods will be reduced.

4.1.9 Archaeological and Cultural Heritage Sites

There are no Archaeological and Cultural Heritage sites in the scheme area, therefore there is no impact. However, in the event of any discovery of an unidentified archaeological or cultural heritage site, the contractor will notify the site engineer who will make the required design changes. In case of any discovery, the chance finds procedure, as given in Appendix H, shall be the contractor.

4.2 Biological Environment

This section of ESMP provides brief information on the biological aspects (i.e., Mammals, avi-fauna, reptiles, and amphibians), land patterns present in/near the scheme area.

4.2.1 Land Pattern in Scheme Area

In the scheme area, the different types of land use exist beyond the RoW of the Sehan river and its proposed work locations, such as; barren land, rocky areas, trees, shrubs, grass, and agricultural land. The tree

[17] EA Assessment BIWRMD Project & Feasibility and Design Study Report Sehan FIS (Volume-1)
[18] Baseline environmental monitoring conducted through EHS JV EGE Laboratory, Karachi during the month of October 2020.

species found recorded were Babur *(Acacia Nilotica)*, Ber *(Ziziphus nummularia)*, Al-mond *(Prunus amygdalus*). While within RoW, the bed of the river contains piedmont plains, the large size of gravels, sand deposits, and scattered vegetation cover. In addition, the different types of vegetation found in the scheme area include, Makhai (*Caragana ambigua),* Zarga (*Prunus eburnean),* Sasai (*Erbenus stellate),* Ghuzaira (*Stockia bruchica),* Sandraza (*Lactuca orientalis),* Tarkha (*Artemisia maritima),* Spalmae (*Callotropi sprocera),* Sargara (*Cymbopogon jawarancusa),* Sabba (*Chrysopogon serrulatus),* Washta (*Stipa pennata).* The lifeline of these different vegetation cover is dependent upon rainwater and floodwater. While no invasive/non-indigenous species were found in the scheme area.

4.2.2 Protected Areas

There is no protected or sensitive area in the vicinity of the scheme area. While in the Nari River Basin, there are two reserves named Ziarat Juniper Biosphere and Wam Games Reserves, and both these reserves are located in the district of Ziarat and at about 160 km to the North-West side of this scheme. As these are located beyond the corridor of impact and engineering interventions, therefore, there shall be no direct or indirect impact on these reserves during the implementation phase of the sub-project.

4.2.3 Fauna

The details of faunal species along with their status in BWPPCM, Act 2014, and IUCN red list.

4.2.3.1 Conservation Status of Fauna

This section provides brief information about the fauna present in the the surrounding mountainous area which is approx. 3km away from the proposed construction sites but in COI of the scheme area. These Key species are classified according to the following criteria.

- Listed as Least Concern, Near Threatened, Vulnerable, Endangered, or Critically Endangered, Extinct in Wild Life, in the IUCN Red List.
- Listed as protected species in the Balochistan wildlife protection, preservation, conservation, and management Act, 2014 (BWPPCM).

4.2.3.2 Mammals

The mammals identified are listed below and are classified in accordance with the IUCN list and Balochistan wildlife protection, preservation, conservation, and management Act, 2014.

Table 20: List of Mammals

S. No	Common Name	Scientific Name	IUCN Conservation status	Protected under BWPPCM Act, 2014	Survey Field/Public Consultation	Literature Review
1	Five-striped palm squirrel	Funambuluspennant ii	Not Listed	No		X
2	Urial	Ovis vignei	Vulnerable	No	X	X
3	Common Hill fox	*Vulpes vine*	Least Concern	Protected	X	
4	Cape hare	*Lepus capensis*	Least concern	No		
5	Wolf	*Canis lupus*	Least Concern	Protected	X	X

6	Afghan hedgehog	Hemiechinusauritus megalotis	Not Listed	No		X
7	Indian Crested Porcupine	*Hystrix indica*	Least Concern	No	X	X
8	House rat	Rattusrattus	Least Concern	No	X	
9	Asiatic Jackal	*Canis aureus*	Least Concern	No	X	X
10	Marbled Polecat	Vormela peregusna	Vulnerable	No		X
11	Afghan Pika	*Ochotona rufescen*	Least Concern	No	X	X

4.2.3.3 Key Species

The following key mammals are declared as protected by the BWPPCM Act, 2014 and classified as near threatened, endangered, and vulnerable in IUCN red list.

Table 21: List of Key Mammals

Protected in BWPPCM Act, 2014	IUCN Classification
• Common Hill fox (*Vulpes vulpes)* • Wolf (*Canis lupus)*	• Urial *(Ovis vignei)*- **Vulnerable** • Marbled Polecat *(Vormela peregusna)* -**Vulnerable**

4.2.3.4 Avi-Fauna

The details of the birds identified during the survey and literature review are given below. The below table also provides the details of avi-fauna species with respect to status in BWPPCM Act, 2014, and IUCN red list.

Table 22: List of Avi-Fauna

S. No	Species	Protected under BWPPCM Act, 2014	IUCN Classification	Field Survey /Public Consultation	Literature Review	Occurrence		Preferred Habitats
						R	M	
1.	Imperial Eagle (*Aquila heliaca)*	Protected	Vulnerable	X		X		Terrestrial; agricultural areas and trees
2.	Brown-necked Raven (*Corvus ruficollis)*	No	Least Concern	X		X		Terrestrial; arable land urban areas and rocky areas
3.	Chukar*(Alectoris chukar)*	No	Least Concern	X	X	X		Rocky, arid hillsides
4.	Magpie (Pica pica)	No	Least Concern		X	X		Mountainous areas
5.	Black Bittern (*Ixobrychus flavicollis)*	No	Least Concern	X		X		Terrestrial; vegetated areas and tree thickets
6.	Houbara Bustard (Chlamydotis undulata)	No	Vulnerable	X			X	Cultivated Lands

7.	Indian House Sparrow (*Passer domesticus)*	No	Least Concern	X	X	X		Terrestrial habitats
8.	Common Crane *(Grus grus)*	Protected	Least Concern	X	X		X	Trees and rice paddy fields
9.	Bank myna *(Acridotheres ginginianus)*	No	Least Concern	X		X		Cultivated farm lands
10.	Short toed eagle (*Circaetus gallicus)*	No	Least Concern	X	X		X	open cultivated plains and foot hills
11.	See-see Partridge (*Ammoperdix griseogularis)*	No	Least Concern	X	X	X		Prefers flatter terrain often close to water, and trees
12.	Little brown or Laughing dove (*Streptopelia senegalensis)*	No	Least Concern		X		X	Trees and cultivation lands
13.	Common Myna (*Acridotheres tristis)*	No	Least Concern	X		X		Terrestrial; urban areas and suburban environments
14.	Rock bunting (*Emberiza cia)*	No	Least Concern	X	X	X		Rocky mountainous areas
15.	Greter Spotted Eagle (*Aquila clanga)*	Protected	Vulnerable	X			X	Terrestrial, tall trees and freshwater

From the above-listed avifauna species, the following table provides the list of Key species that are protected in the BWPPCM Act, 2014, and classified as vulnerable and near threatened in IUCN red list.

Table 23: List of Key Avi-Fauna Species

Protected in BWPPCM Act, 2014	Status in IUCN Classification
• Imperial Eagle(*Aquila heliaca)* • Common Crane *(Grus grus)* • Greter Spotted Eagle (*Aquila clanga)*	• Imperial Eagle (*Aquila heliaca)*-***Vulnerable*** • Houbara Bustard *(Chlamydotis undulata)*- **Vulnerable** • Greter Spotted Eagle (*Aquila clanga)*- **Vulnerable**

4.2.3.5 Reptile and Amphibians

The following reptile and amphibians were identified during the ecological surveys.

Table 24: List of Reptiles and Amphibians

S.No	English Name	Scientific Name	Status in IUCN Red List	Protected in BWPPCM Act, 2014	Field Survey/Public Consultation	Literature Review
1	Brilliant Ground Agama	*Trapelus agilis*	Not Assessed	No	X	
2	Skittering Frog	*Rana cyanophlyctis*	Least Concern	No	X	
3	Bengal Monitor	*Varanus bengalensis*	Least concern	Protected	X	X

4	Oxus Cobra	*Naja sp.*	Data Deficient	Protected	X	
5	Gecko, Mountain Dwarf	*Tropiocolotes depressus*	Not Assessed	No	X	X
6	Horned Viper	*Cerastes depresses*	Least Concern	No	X	
7	Tortoise Afghan	*Testudo horsfieldii*	Vulnerable	Protected	X	X
8	Northern wolf snake	*Lycodon striatus*	Not Assessed	No		X
9.	Spotted Ground Agama	*Trapelus ruderatua*	Not Assessed	No	X	

From the above-listed reptile and amphibians, the following table provides the list of Key species that are protected in the BWPPCM Act, 2014, and classified as vulnerable and near threatened in IUCN red list.

Table 25: List of Key Reptiles and Amphibians

Protected in BWPPCM Act, 2014	Status in IUCN Classification
• Bengal Monitor (*Varanus bengalensis)* • Oxus Cobra (*Naja sp).* • Tortoise Afghan (*Testudo horsfieldii)*	• Tortoise Afghan (*Testudo horsfieldii)*-Vulnerable

4.2.3.6 Fish Species

The presence of fish in the stretch of Sehan River in the scheme area has not been observed as this river only depends upon flood water and cannot support life due to the inconsistent floodwater flow of the river which is only available during the rainy season. However, during extreme monsoon rains, it is reported by the local community and as mentioned in the EA of the BIWRDMP that Mahasheer fish is found in the sub-project area coming from lagoons and other water bodies located in the upper reaches of the NRB. The project will hire limnologist to carry out the further study of the fish species present in the sub-project area and will complete the following tasks:

- Collect hydrological data from two basins (PRB & NRB) nearby to the sub-project areas.
- Examine and summarize the two season primary and secondary data on fishes and aquatic flora and fauna in the project area of Porali and Nari river Basin, their biodiversity values, and endangered status;
- Examine and summarize the nexus among ecology/limnology, water resources, and socioeconomic development in the study area.
- Collect data on aquatic species (such as fish, crustaceans, mollusks, algae and other organisms of value such as aquatic plants) One km upstream and downstream.
- Assess impacts on aquatic ecology due to the extraction activities (i.e sand and gravel material) from river bed. And propose mitigation and management measures.
- Develop restoration plan for aquatic ecology of the study area based on primary and secondary data.
- Formulate limnological monitoring system and improving the performance indicators compatible with the aquatic biodiversity values;
- Conduct consultations with communities of the study area and experts and integrate the results of the consultations into the overall assessment.
- Give presentations to the project management or other stakeholders as needed.

5 Socio-Economic Baseline

5.1 General

During the preparation of the SIAMP document in 2016, a detailed socio-economic baseline study was conducted, which provides detailed information regarding the socio-economic status of the scheme area. However, to determine the current situation and socio-economic impacts in the specific areas and near to the Sehan Scheme, a socio-economic baseline sample survey with a 17% sample size has been conducted from April to May 2020. In this regard, 130 male and 63 female members of households were interviewed separately. The survey was held in 193 out of 1161 total households and for females, it was 5%.

5.2 Language

Pashto is the major language and spoken by all the communities living in the scheme area. Urdu is also spoken language by most of the communities.

5.3 Education Facilities

There were 18 primary boys' and girls' schools provided by the GoB in the scheme area villages. From which there are 12 primary, two middle, one high school, and a college are available for boys, while for girls there are six primary, one middle and high school are available for their education. The dropout ratio in the girls is partially high than boys as after passing the secondary education (Matric), girls are not allowed to go and take admissions in the boy's college for further study. It was also observed that due to inadequate education facilities in these institutions, for better quality education boys and girls both used to travel to Loralai or Quetta for higher education as university level education is only available for these students in Loralai and Quetta. The details of available education facilities for both boys and girls are given in the table below;

Table 26: Education Facilities

Gender	Educational Institutes				
	Primary	**Middle**	**High**	**College**	**University**
Boys	12	02	01	01	---
Girls	06	01	01	---	---

Source: Socio-economic survey by PMU/PSIAC teams

5.4 Health Facilities

There is one civil hospital, rural health centre, two basic health units (BHU), two dispensaries, four midwifery units, and one private maternity home available for all seven scheme villages in the Mekhtar town of Tehsil Mekhtar areas. It was observed that for minor or average treatments these health facilities are fulfilling all

health requirements of the rural population however, for major treatment or in case of emergency and better health treatment for serious health care needs, patients are either need to be transported to District Headquarter hospital of Loralai, Quetta City or Multan of Punjab province.

Table 27: Health Facilities

Sehan Flood Irrigation Scheme	**Hospital**	**Rural Health Centre**	**Basic Health Unit**	**Dispensary**	**Midwifery Units**	**Private Maternity Centre**
	01	01	02	02	04	01

Source: Socio-economic survey by PMU/PSIAC teams

5.5 Water Supply and Sanitation

There are ten water supply schemes in the area for drinking water and domestic use, out of these three are non-functional. Generally, the communities are deprived of water availability due to heavy outage of the electricity, which is in most cases are 20 hrs long. Therefore, due to the non-availability of alternative water resources, the villagers are reliant to fetch groundwater from the closest private tube wells operated from the solar panels using donkeys and other livestock for transportation to meet their drinking and other domestic needs. There are no sewerage and sanitation systems in all villages.

5.6 Communication and Electricity

Telephone landline facility is not available while mobile service of different companies are existing in the sub-project area; including Mekhtar Town, the tehsil headquarters of the Loralai District is at the distance of only about 05 km away. They get mobile phone signals easily for communication. The houses in all villages have electricity supply from the national grid, while they have installed UPSs or solar panels (China made) as a secondary source of generating electricity for their domestic as well as for agricultural purposes. Natural piped gas supply is not available in all villages. The residents of these villages use gasoline, LPG, bushes, and firewood to meet their domestic needs.

5.7 Means of Transport

The scheme area is located within Mekhtar Town, which is 80 km away from Loralai City (Headquarters of the district), 300 km away from the Multan City of Panjab Province, and 170 km from Quetta City (Headquarter of the Balochistan province). The community travels to these cities using local transports like minibusses, buses, or private taxies, and pickups. Individuals in the community often use their source of transport (mainly motorbikes) for local use. The Link roads of these villages are *Katcha* tracks and are in very poor condition, and need for construction/rehabilitation.

5.8 Social Conflicts

There are no reported tribal conflicts in the scheme area as one tribe Hamzazai is living in this whole area and they obey the orders of their JIRGA (a group of notables), who remained active if any conflict will arise. It is anticipated that this local tribal system which is led by the tribal elders, notables of the area, and village

heads will play an active part to mediate and resolve conflicts if any arise in the future. During the survey, it was revealed that they also take the district administration on-board to control the law and order situation, if any occurred. The private/tribal system and district administration jointly have, in many cases, proved to be more effective in conflict resolution than the individual ones.

5.9 Household Information

The socio-economic baseline survey revealed that due to the proposed scheme a positive impact will be expected on the overall population of the entire command area comprised of 1,161 households. The details are illustrated in the following table:

Table 28: Number of households and total population

Village	Households	Population
Raj Bandi	106	795
Balao Ghaffarabad/Gohar jan	92	690
Pakistan Bashai/Laghara	58	435
Mekhtar town	665	4998
Aghbarg	91	683
Zizgay	108	810
Balao Sahib Gull/Khairudin	61	460
Alawalzai/ Manazai	76	510
Total	1161	9381

Source: Socio-economic survey by PMU/PSIAC teams

5.9.1 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 revealed that 05% of the respondents were between 21-30 years, 55% were between 31-40 years, 23% were between 41-50 years, 17% were between 51-60 years of age group.

Female: The survey revealed that 08% of respondents were between 20 and below age group, 25% of respondents were between 21-30 years, 17% were between 31-40 years, 14% were between 41-50 years, 15% were between 51-60 years, 19% were between 61-70 years and 05% were 70 years old.

Table 29: Age of Respondent

Responds' Age	**Raj Bandi, Balao Ghaffarabad/Gohar Jan, Pakistan Bashai/Laghara, Mekhtar town, Aghbarg, Zizgay, Balao Sahib Gull/Khairudin, Alawalzai/ Mananzai, Tora Laray**
No out of 130 Male Respondents	
< 20	0
21- 30	07
31- 40	71
41 – 50	30
51 – 60	22
61 – 70	0
70 and above	0

No out of 63 Female Respondents	
< 20	05
21- 30	16
31- 40	11
41 – 50	09
51 – 60	07
61 – 70	12
70 and above	03

5.9.2 Religion

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

5.9.3 Respondent's Relationship with Head of Household

During the survey, 60% of the respondents or heads of households were personally available for an interview, 16% of the respondent were fathers, 03% were sons, 04% sisters, 11% mothers, 06% daughters and 01% were wives of the heads of the households.

5.9.4 Education Level of Respondents

Male: The socio-economic baseline survey revealed that 42% of the respondents were uneducated, 32.0% have a primary level of education, 11% have completed secondary education (Matric), 02% education have higher secondary school qualification (Intermediate), and 02% have completed university-level education (Graduation and Masters).

Female: The socioeconomic baseline survey revealed that 49% of the respondents were uneducated, 29% have a primary level of education, 11% have completed secondary education (Matric), 06% education have higher secondary school qualification (Intermediate), and 05% have completed university-level education (Graduation and Masters). The details of male and female respondents are illustrated in the following table.

Table 30: Education Level

Education Levels	Raj Bandi, Balao Ghaffarabad/Gohar Jan, Pakistan Bashai/Laghara, Mekhtar town, Aghbarg, Zizgay, Balao Sahib Gull/Khairudin, Alawalzai/ Mananzai, Tora Laray
No out of 130 Male Respondents	
Un-educated	54
Primary (up to 5 Years)	61
Secondary (up to 10 years)	22
High Secondary School (up to 12 Years)	4
University	3
No out of 63 Female Respondents	
Un-educated	31
Primary (up to 5 Years)	18
Secondary (up to 10 years)	7
High Secondary School (up to 12 Years)	4
University	3

5.9.5 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 27.

Table 31: Average Family Size

Family Size	Raj Bandi, Balao Ghaffarabad/Gohar Jan, Pakistan Bashai/Laghara, Mekhtar town, Aghbarg, Zizgay, Balao Sahib Gull/Khairudin, Alawalzai/ Mananzai, Tora Laray
1 to 5	84
5 to 10	71
10 to 15	38
15 & above	0

Source: Socio-economic survey by PMU/PSIAC teams

5.9.6 Family System

Approximately 76% of the households were living in a joint family arrangement while 24% were part of the nuclear family system. In the joint family system, the eldest male member takes care of all the family members and has the final decision-making authority particularly for issues regarding the public domain. This system also provides social security for family members during periods of individual unemployment and financial crisis especially to poor women, the elderly, infirm or ill, orphans, etc. These communities believe that the joint family system is a more economical way of living as they often work together on the same land and can share their joint incomes to support the entire family, including the elderly, orphans, single women living alone, and infirm or ill who are unable to work. The family arrangements (nuclear and joint) are illustrated in the table below.

Table 32: Family System

Family System	Raj Bandi, Balao Ghaffarabad/Gohar Jan, Pakistan Bashai/Laghara, Mekhtar town, Aghbarg, Zizgay, Balao Sahib Gull/Khairudin, Alawalzai/ Mananzai, Tora Laray (In %)
Joint	76
Nuclear (Single)	24

5.9.7 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 33: Marriages

Marriage System	Raj Bandi, Balao Ghaffarabad/Gohar Jan, Pakistan Bashai/Laghara, Mekhtar town, Aghbarg, Zizgay, Balao Sahib Gull/Khairudin, Alawalzai/ Mananzai, Tora Laray (In %)
Outside family marriage	30%
Inside family marriage	70%

Source: Socio-economic survey by PMU/PSIAC teams

5.9.8 Health Problems

The most common diseases in these villages included typhoid, hepatitis B & C, diarrhea, and malaria and now a days COVID-19, however, there are no reported COVID cases in the sub-project area due to lack of testing facilities. These diseases largely occur due to lack of awareness, unhygienic living conditions, lack of sanitation and safe drinking water facilities, malnutrition, and lack of ready access to proper healthcare, including preventive healthcare facilities.

5.9.9 Money Lending

In the scheme area, capital is not borrowed from banks for agricultural purposes instead money is borrowed from middlemen (*arthis)* for agricultural inputs (seeds, fertilizers, etc.) and health treatment, (i.e., illness). In times of need, community members take loans from relatives and friends.

5.10 Common Needs to Visit Nearest City

Family members visit the nearest city for various purposes. A significant percentage 77% of family members visit the nearest city for business purposes, 23% visit for health services and only 01% for educational purposes.

Table 34: Purpose of the Visit to nearest City

Purpose of Visit	Raj Bandi, Balao Ghaffarabad/Gohar Jan, Pakistan Bashai/Laghara, Mekhtar town, Aghbarg, Zizgay, Balao Sahib Gull/Khairudin, Alawalzai/ Mananzai, Tora Laray (In numbers)
Family relations	0
Marketing/Business/Agriculture	148
Educational	2
Health	45

Source: Socio-economic survey by PMU/PSIAC teams

5.11 Livestock

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

Table 35: Average No & Type of Livestock Ownership

Livestock Ownership	Raj Bandi, Balao Ghaffarabad/Gohar Jan, Pakistan Bashai/Laghara, Mekhtar town, Aghbarg, Zizgay, Balao Sahib Gull/Khairudin, Alawalzai/ Mananzai, Tora Laray (In numbers)
No. of Buffalos	0
No. of cows	148
No. of Goats	1,025
No. of Sheep	405
No. of Oxen	41
No. of chicken	296
No. of Donkey	35

5.11.1 Cost of Livestock

The average cost of livestock commonly found in the area is given in the following table.

Table 36: Average cost of Livestock

Name of Livestock	Average Cost/unit (in PKR)	Expenses in USD[19]
Cows	80,000	398
Goats	17,000	84.5
Sheep	18,000	89.5
Donkeys	15,000	74.6
Chicken	700	3.4

Source: Socio-economic survey by PMU/PSIAC teams

5.11.2 Source of Fodder

Farmers meet their livestock grazing needs from the nearest rangeland. In addition, fodder is also cultivated on agricultural land. Straw is also used as fodder. Only 5% of farmers purchase fodder from the market.

5.12 Source of Livelihood and Income

The baseline survey indicates that agriculture is the primary source of income in all these villages. The monthly income ranges from PKR 40,000 to PKR. 120,000. All the households also have a secondary source of income, including livestock, transportation, business, and salaried employment, and earn between PKR 14,000 to PKR 30,000 every month from as a secondary source of income.

5.13 Agriculture Tools and Farm Machinery

The agriculture of the scheme is dependent on rain and floods water, where the water is available for late *Khareef* (autumnal) *to Rabi* (spring) season crops. The farmers did not possess farm implements such as

[19] The exchange rate 1 USD = PKR 201

tractor, trolley and thresher for ploughing and harvesting of crops. While only 06% of the farmers owned a spray machine. The other farm machinery such as a tractor and thrasher are available on rent. The type and number of farm equipment available are provided below.

Table 37: Type of Agriculture Tools and Machinery

Type of Equipment's	Raj Bandi, Balao Ghaffarabad/Gohar Jan, Pakistan Bashai/Laghara, Mekhtar town, Aghbarg, Zizgay, Balao Sahib Gull/Khairudin, Alawalzai/ Mananzai, Tora Laray (In numbers)
Plough for oxen	00
Plough for tractor	17
Tractor	20
Spray Machine	09
Trolley for tractor	16
Thresher	06

Source: Socio-economic survey by PMU/PSIAC teams

5.13.1 Commonly Used Agriculture Inputs

The average agricultural expenses per acre, including seed, fertilizer, pesticide, ploughing, and harvesting costs, is PKR 8,150 (USD 40.5) per crop.

Table 38: Estimated Expenses per Year per Acre

Items	Expenses/Acre	Expenses/Acre in USD[20]
Ploughing	4,000	20
Cotton seeds /bag (10kg)	10,000	49.7
Urea DAP	1,450	7.2
DAP	3,050	15.1
Pesticides/Lit	1,400	7
Total cost	19,900 PKR	99

5.14 Seasonal Earnings from Crops

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

Table 39: Average Seasonal Earnings/acre

Seasons	Average Seasonal Earning/Acre (in PKR)	Avg. Earning/ Acre (in USD)
Rabi (autumnal)	25,000	124.3
Kharif (Spring)	16,000	79.6
Rabi and Kharif (Both)	41,000	204

Source: Socio-economic survey by PMU/PSIAC teams

[20] 1 USD= PKR 201

5.15 Agricultural landholding and cropping pattern

The tenancy is not common in the scheme area. The entire 100% of the land is cultivated by the owners themselves. While 0% is tenant operated. The agricultural land area is fertile and farmers grow maize, vegetables, and fodder during the *Kharif* (spring) season (July to October) and wheat, pulses, lentils, and vegetables during *Rabi* (autumnal) season (October to March).

5.16 Anticipated Losses due to the Project

The potential losses in terms of physical and economic displacement are not expected due to the proposed intervention. However, 395 trees are expected to be felled and 39 acres of land have been obtained, as shown in the following table.

Table 40: Anticipate Losses due to Project

Anticipates	Results
Loss of Residence	No
Loss of cultivated/uncultivated/barren land	39 acres of land acquired through the VLD process
Loss of trees	Yes (395 nr of trees) (The further details of trees species, cutting, and mitigation measures are provided in section 6.2.8)
Loss of Livelihood	No
Loss of Other infrastructure	No

Source: Socio-economic survey by PMU/PSIAC teams

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.

5.17 Housing

The baseline survey reveals that houses are owned by the community members and there is no household which is a rented house.

5.17.1 Average Number of Rooms

The number of rooms owned by the target communities in the project area is 1-5 in 87.0% homes, 5-10 in 19% homes, and 10 and above in 0% homes. The details are given in the following table.

Table 41: Ownership of Rooms

Room Ownership	Raj Bandi, Balao Ghaffarabad/Gohar Jan, Pakistan Bashai/Laghara, Mekhtar town, Aghbarg, Zizgay, Balao Sahib Gull/Khairudin, Alawalzai/ Mananzai, Tora Laray) (In numbers)
1 to 5 rooms	168

5 to 10 rooms	36
10 and above	0

Source: Socio-economic survey by PMU/PSIAC teams

5.17.2 Pit Latrines and Toilets

In all villages, 73% of houses have toilets facilities and 23 were without toilets; however, the available toilets were not connected to a proper sanitation system. Open defecation is also practiced.

5.17.3 Type of Housing

In the sub-project area, 51% of the houses were semi pucca (Brick mercenary and mud), and 49% of houses were *Katcha* (mud-houses).

Table 42: Housing Type

Type of House	Raj Bandi, Balao Ghaffarabad/Gohar Jan, Pakistan Bashai/Laghara, Mekhtar town, Aghbarg, Zizgay, Balao Sahib Gull/Khairudin, Alawalzai/ Mananzai, Tora Laray) (In numbers)
Pucca (bricks mercenary)	0
Semi pucca (Brick mercenary and mud)	99
Katcha (Mud houses	94

5.17.4 Residential Plot Size

The baseline survey revealed that the plot size in the sub-project area is between 2500 ft. to 3500 sq. ft. in 56% of households; 3600 ft. to 5000 sq. ft. in 38% of households; and above 5000 sq. ft. in 06% of households.

Table 43: Plot Size

Plot Size in sq. ft. (Approx.)	Raj Bandi, Balao Ghaffarabad/Gohar Jan, Pakistan Bashai/Laghara, Mekhtar town, Aghbarg, Zizgay, Balao Sahib Gull/Khairudin, Alawalzai/ Mananzai, Tora Laray (In numbers)
2000 to 3500	109
3600 to 5000	73
5000 & Above	11

Source: Socio-economic survey by PMU/PSIAC teams

5.18 Land Ownership

The 100% of the land is cultivated by owners themselves and no tenant operated land is reported in the sub-project areas. The communal 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 all villages. However, if the land is sold, the land transfer of ownership is done formally and is recorded with the Revenue Department.

5.19 Community-Based Organization (CBOs) and NGOs

One local NGO, Balochistan Rural Support Program (BRSP) is actively working in the sub-project area. The overall goal of this organization is poverty reduction and to harness peoples potential through self-reliant efforts by using social mobilization of communities as a cross-cutting theme for all sectors and implementing different projects funded by various donors. They are providing support in different sectors such as education, livelihood, microcredit, and physical infrastructure schemes at the village and union council levels. BRSP is now implementing a European Union-funded project covering rural development including raising awareness on COVID-19 outbreak and has also provided Hand Washing Tanks in different places, printed awareness material, sanitizers, soaps for hand washings, and masks at households level and government offices to facilitate the local population and government departments to minimize the spread of coronavirus.

5.20 Customary Institutions

The tribal system is prevalent in the scheme area and the only tribe is Hamzazai (Kakar).

5.21 Local Government and Administration

The elected members of provincial and national assemblies are now actively involved in the overall development works at their constituencies. Before these arrangements, the local government representatives such as Chairman, Vice-chairman, and their Councillors were operating under the Balochistan Local Government Act 2013; and were responsible for the development works at the village, union councils, and district levels respectively. At the village and union council level, the union council Chairman and councilors were responsible for village and union council level development activities. At the district council level development works were the responsibility of the district council led by the Chairman. However, now this system is no longer prevailing in the area but because of being political workers, these councillors and chairmen are now jointly working with the members of national and provincial assemblies and supporting them to improve the development of their areas.

The district-level bureaucracy is also part of this development process, which consists of the Deputy Commissioner, Additional Deputy Commissioner, assistant commissioners, officers' in-charge of line departments, and revenue officials.

5.22 Law and Order Situation

The law-and-order situation in the scheme area is under the control of the district administration, police, and Frontier Corps (FC). The current security situation of the project area is better than in the past due to the presence of security forces but still, the security risks in the Balochistan Province are high.

5.23 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 Sehan River, Sehan Channel, and distributary minors. The details are illustrated in the following table.

Table 44: Community Cultural Properties

Village	Grave Yard	Mosque	In RoW
Scheme area	03	06	No

Source: Socio-economic survey by PMU/PSIAC teams

5.24 Community Awareness about Scheme Works

The communities in the scheme area are aware of the proposed civil works to be carried out in three separate sub-projects and their implementation schedule. This awareness was provided during repeated cycles of public consultations by the project PSIAC staff during the formation of FO's and women's development groups (WDGs) and other related planned activities. In addition, separate women and men consultation meetings were organized in all villages from the period of October 2019 to August 2020.

5.25 Community Demands

During public consultations and baseline data collection activities in the scheme area, the basic priority needs of the communities were determined. These are as follows:

1. Water ponds for agricultural purposes
2. Sewerage System
3. Arrangement for natural gas
4. Water supply system
5. Poultry farming
6. Livestock rearing and vaccination
7. Construction of separate washing places for clothing and kitchen needs

Further details are available in the section on stakeholder consultations.

6 Environmental and Social Impacts and Mitigations Measures

6.1 Overview

This Chapter assesses the impacts on the environment (physical and biological) and social aspects of the Sehan FIS. The significant impacts and mitigation measures to be implemented by the contractor during the execution phase of the sub-project are illustrated as follows:

6.1.1 Screening of Environmental and Social Impacts

As part of the environmental and social impact assessment process, a screening matrix focusing on environmental and social impacts was developed specifically for the proposed sub-project. The matrix examined the interaction of project activities with various components of the environment and society. The impacts were broadly classified as physical, biological, and social. Each of these broad categories was further divided into different aspects. The potential impacts thus predicted were characterized as:

- High negative (adverse) impact,
- Medium (adverse) impact,
- Low Adverse Impact
- High positive (beneficial) impact,
- Medium positive impact, and
- Low Positive

Appropriate mitigation measures are recommended in this chapter. These measures are set in place to reduce the occurrence or possibility and severity of potential adverse impacts.

6.1.2 Impact Characterization

Once potentially adverse impacts were identified, they were characterized as follows:

- **Nature**: Direct/Indirect
- **Duration of impact:** Short term (less than 5 years of the project), Medium-term (5 to 15 years), and long term (15 Years and above)
- **Reversibility of impact:** Reversible/Irreversible
- **Likelihood of impact**: Certain, Likely, Unlikely, Rare
- **Consequence of Impact:** Severe, Moderate, Mild/Minor.

6.1.3 Impact Assessment and Mitigation

An impact assessment was completed based on the impact characterization above. All the attributes of an impact, particularly the likelihood of occurrence and consequence severity, were used to assess the impact either as 'high', 'medium', or of 'low' significance. Each environmental and social impact identified during the screening stage was assessed according to this criterion.

6.1.4 Determination of Mitigation Measures

Following the impact of characterization and assessment, appropriate mitigation measures were identified. These measures are set in place to minimize, if not eliminate, the adverse impacts associated with sub-project activities.

6.1.5 Assessment of Residual Impacts

Mitigation measures cannot always eliminate the adverse impacts associated with project activities. In many cases, there are residual impacts even after the implementation of mitigation measures. The final step of the entire impact assessment process is to determine the residual impact. These residual impacts are monitored during project implementation and it is ensured that they become insignificant.

6.2 Environmental Impacts and Proposed Mitigation Measures

6.2.1 Construction of Sehan (Flood Irrigation Scheme)

The overall BIWRMD Project area is under Sailaba, Khushkaba, and tube well-irrigated farming systems but the little area is brought under cultivation as farmers can't control and manage the floodwater. Droughts and floods are common in Balochistan Provincecharacteristics of floodwater, therefore, any controlled irrigation scheme will help to manage the droughts and floods and provide a more reliable source of water. The reliable source of water and diversification of livelihood will improve the landscape with improved surface cover resulting in reduced wind erosion and environmental improvement due to increased flora and fauna, and the runoff water harvesting and ponding in micro-catchments (eye-brow terraces) will supplement the incident rainfall to the extent that adequate water is made available. The construction of the scheme is designed to improve the landscape so that surface cover is increased and benefiting in groundwater recharge which will ultimately bring further reliability and sustainability in landscape improvement and livelihood generation. The communities would get sustained water for irrigation and ultimately would also be using it for drinking and washing purposes.

Particularly for this sub-project, due to the non-availability of an irrigation system under the Sehan area, the farmers divert the floodwater to their lands by locally available means on a temporary basis. Following the construction of proposed activities under these sub-projects (Package 1, 2 & 3) there will be a long-term positive impact throughout the command area of the scheme.

The construction of hydraulic structures will reduce the loss of floodwater, sedimentation, and discharge will be controlled while the construction of 12.6 km long sehan channel and two distributary minors will increase efficiency and effectiveness of floodwater distribution to the downstream side, and within the

command area, thus providing benefits to the agriculture land at tail end. In addition, it will also improve the reliability and equity of irrigation flow resulting in ultimate user satisfaction.

Furthermore, the construction of weir and fall structures will also cause water ponding on the upstream side, increasing irrigation capacity and providing a beneficial breeding environment for fauna habitat. The associated positive and negative impacts of each proposed works are provided in the table below.

Table 45: Associated environmental and social impacts

Sr. No.	Sub-project Aspects	Positive and Negative Impacts
Construction of Sehan Weir and Fall Structures		
1	Increased upstream water storage	• The water table in the vicinity will increase the availability of water for drinking, washing, and other uses – Positive • Maintenance of the integrity of the land alongside ephemeral streams since the land area which would be eroded and braided by the unchecked flood water is now protected- Positive • Increase in recharge of aquifers through percolation - Positive • With an increase in flow velocity, the channel water would carry more sediments downstream which could negatively affect crop production- Negative. This issue has been addressed in the engineering design of the weir to control the excess sediment load
2	Increase in Agricultural Productivity	• Besides the increase in livelihood, enhanced agricultural activities will increase fertilizers and pesticides use– Negative. The project has developed the IPMP which will be used to mitigate this impact.
3	High water head for Sehan channel and distributary minors, resulting in increased velocity	• The rapid flow of water will result in the availability of water for tail end-users – Positive • Tail end fields initially without access to water will get irrigated- Positive
4	Flourishing aquatic flora and fauna, especially on the upstream side	• In flood season, Aquatic fauna can easily cross Weir due to V-shape- Positive • Seasonal aquatic fauna and flora will get more time for their growth- Positive
5	Socio-economic uplift and poverty alleviation	• Enhanced agricultural production will result in an uplift of local livelihood - Positive • Enhanced livestock productivity due to availability of fodder and water - Positive
Construction of Guide Bunds		
6	Impact on Community Health and Safety	• During flood season there is a chance of drowning of the local population especially children, of the surrounding communities - Negative. The project will conduct the community awareness session at the subproject site.
7	More water availability	• More water for fields- Positive.
8	Flourishing aquatic flora and fauna Sehan Area	• Seasonal aquatic fauna and flora will get more time for their growth- Positive.

9	Socio-economic uplift and poverty alleviation	• Enhanced agricultural production will result in an uplift of local livelihood – Positive. • Enhanced livestock productivity due to availability of fodder and water – Positive.
10	Impact on Community Health and Safety	• Loss of field and crops will be reduced due to uninterrupted passage of water through supper-passages and aqueducts – Positive.
11	Impact on sediment load of existing water bodies	• Soil and construction material may fall or find its way into the Sehan River. Negative and can be managed by adopting the mitigation measures as defined in the relevant chapter.
Construction of Head Regulators and Under Sluice		
1	Proper water regulation head Regulator	• Water flow wastage will be reduced by proper regulation of gates as per need of the river/channel- Positive • The land along the channel will be protected which would be eroded and braided by the uncontrolled flow of water, is now protected- Positive • The increase is flow velocity; due to properly designed structure will result in reaching water at tail field-Positive • Increase in recharge of aquifers through percolation – Positive • Increase in sediment transported by channel water-Negative: This aspect is addressed in construction design to reduce the amount of sedimentation carried by the channel water.
2	Increase in efficiency of Channel and distributary minors	• Previously spur was easily damaged by high flow into the river, the properly designed guide bund with rip rap and stone pitching have a longer life – Positive • Channel banks will be more safe – Positive.
3	Decreasing possibility of Flooding of Fields	• Proper structure of head and escape regulators will save water by avoiding topping and overflow - Positive • Water overflowing and topping the bunds and flooding nearby fields will be avoided due to escape regulator – Positive.
4	Enhanced Agricultural Productivity	• The field may get water beyond flood season due to the proper regulation system of water - Positive • Besides the increase in livelihood, enhanced agricultural activities will increase fertilizers and pesticides – Positive • Increased use of pesticides and chemicals for crop productivity- Negative.
5	More water availability	• Availability of water for tail end-users, resulting in enhanced agricultural production – Positive. • Tail end fields initially without access to water will get irrigated- Positive.
6	Effects on aquatic flora and fauna, especially in the channel and in Sehan river	• Aquatic fauna and flora will get more time for their growth- Positive. • Sedimentation and discharge of pollutants and during construction directly into aquatic and indirectly into marine ecosystems could result in habitat destruction and potential loss of ecosystem function- Negative. • Changes in water hydrology and flow could lead to disruption of the natural ecosystem and thus, effect biodiversity of the area – Negative.

		• However, it must be noted that the contractor shall carry out the construction activities after the construction of temporary diversions channels that will fulfil the requirements of aquatic fauna downstream to flourish and therefore, maintain the water flow.
7	Socio-economic uplift and poverty alleviation	• Enhanced livestock productive-Positive • Enhanced agricultural production will result in an uplift of local livelihood – Positive.
8	Impact on Community Health and Safety	• Community loss of field and crops will be reduced due to proper regulation of water through escape and head regulators – Positive.
The Risk to Terrestrial Avi Fauna		
1	Impact on Terrestrial Avi-Fauna	• During the construction of temporary diversion channels and earthworks, there is a risk to terrestrial avi-fauna, such as; struck by construction machinery or run over or struck by excavator bucket-Negative • While the risk to ground-nesting birds shall be struck by the machinery throughout the nesting season. This risk is not considered beyond the nesting period, as outside this period, the birds shall vacate the area before construction machinery approaches-Negative • The potential risk results from uncontrolled waste disposal and includes entanglement within solid waste and pollution of water sources due to improper disposal of waste-Negative.
Construction of Road Crossing Structure		
1	Temporary disturbance to local community	• During the construction of road crossing structure temporary disturbance will be created to the movement of local traffic-Negative
2	Water availability at downstream side	• The construction of road crossing structure will allow continuous flow of water at tail of Sehan Channels -Positive • Availability of water for tail end-users, resulting in enhanced agricultural production – Positive. • Tail end fields initially without access to water will get irrigated- Positive
3	Socio-economic uplift and poverty alleviation	• Enhanced agricultural production will result in an uplift of local livelihood - Positive • Enhanced livestock productivity due to availability of fodder and water – Positive.

Table 46: Impact Characterization- Rehabilitation of Irrigation Structures

Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance
Direct	Long Term	Irreversible	Certain	Severe	High Positive (Beneficial)

6.2.1.1 Mitigations

Enhanced crop production will cause increased use of pesticides; therefore, Integrated Pest Management Plan (IPMP), as given in Appendix G will be implemented by the agriculture department. An appropriate

diversion will be provided so that construction works are separated from channel flow and hence the sediment runoff into the channel can be avoided. In addition, community health and safety adverse impacts are anticipated during flood season such as drowning of the local population especially children, of the surrounding communities and in this regard, the project will conduct the community awareness session at the sub-project site. To further mitigate these community health and safety issues, the measures given in section 6.3.9 shall be followed by the contractor, which will be temporary during the construction works.

6.2.1.2 Residual Impact

Due to an increase in water availability, proper regulation and avoiding wastage has long-term positive impacts. Agricultural production will also be enhanced and socio-economic uplift in the sub-project area, and by implementing IPMP the impacts will be highly positive in the long term.

6.2.2 Dismantling of Associated Facilities

Following the completion of construction activities under each package, 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 47: 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 bars, paints, and other construction materials.	To be sold back or given to the supplier or other users.
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

Type of Waste	Description	Disposal Method
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 48: 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

6.2.2.1 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 Engineer.
- 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.
- The mitigations given in section 6.2.6.1 shall also adhere to sites.

6.2.2.2 Residual Impact

Through the implementation of these mitigation measures, the impact significance will be reduced to neutral after dismantling and demolition activities.

6.2.3 Coronavirus disease (COVID-19)

During the implementation of the Sehan scheme, it is anticipated that the Covid-19 Pandemic (Corona Virus) will have a negative impact on the health and life of sub-project staff, as the implementation phase will require staff at various levels (Consultants, PMU, and Contractor). This will involve large a number of workers working together for the different construction activities, carrying out site inspections, living together in the campsite and dormitory, preparing, serving, and having food together.

COVID-19 disease can spread easily from an infected person to others through small droplets by nose or mouth during cough or exhaling. These droplets can also land on objects and surfaces around the person and if other persons touch these objects or surfaces, then touching their eyes, nose, or mouth can also be

spread the disease. The project staff can also easily contract COVID-19 if they are sitting together and inadvertently, inhale droplets from a sick person[21].

The viral disease may become dangerous when the infected worker or project staff with a strong immune system may not show any symptoms or signs of Covid-19, while that patient will infect other staff easily with a low immune system, including the elderly, children, pregnant women, and ill persons.

Table 49: Impact of Characterization-Covid-19

Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance
Direct	Long term	Variable	Certain	Severe	High negative (adverse)

6.2.3.1 Mitigations

These SOPs and mitigations provide guidelines in the context of COVID-19 and describe preventive measures, and contingency actions for preventing measures at camps, offices, and worksites, and if cases are reported at the site.

It is estimated up to 150 laborers (50 laborers under each package) will be required for carrying out construction activities. Out of the total, 75 % of laborers will be residents and will return to their homes at night, while 25% (skilled) will have overnight stay at campsites. All the laborers will carry out their activities as per their project work plan given in section 3.2.4.

To implement these mitigations measures, the project has nominated the following person at the PSIAC level for ensuring the Covid-19 guideline adhere to the site.

Table 50: Name of Focal Person

S.No	Name of Focal Person	Designation	Contact No
1	Mr. Shakoor Kakar	Community Development Specialist, PSIAC	+92-333-2211169

Control exits and entry on-site

- Secure the boundaries of the site and establish designating entry/exit points (if they do not already exist).
- Entry/exit to the site should be documented. Ensure screening of the person entering the project office, site, and camp areas and maintain a logbook for record-keeping of temperature readings (using an infrared thermometer) of all the workers entering the office area/building.
- All drivers, conductors, loaders, and other staff of the vehicle transporting materials shall be screened and no person(s) suspected (and any person accompanying the suspected person) to have COVID-19 shall be allowed to enter the site or premises

[21] Studies have shown that the COVID-19 virus can survive for up to 72 hours on plastic and stainless steel, less than 4 hours on copper and less than 24 hours on cardboard (https://www.who.int/news-room/q-a-detail/q-a-coronaviruses).

- Train security staff on the (enhanced) system that has been put in place for securing the site and controlling entry and exit, the behaviours required of them in enforcing such system, and any COVID - 19 specific considerations.
- Train staff who will be monitoring entry to the site, providing them with the resources they need to document entry of workers, conducting temperature checks, and recording details of any work that is denied entry.
- Confirm that workers are fit for work before they enter the site or start work with special attention to workers with underlying health issues or who may be otherwise at risk. Consideration should be given to the demobilization of staff with underlying health issues.
- Provide daily briefings[22] to workers before commencing work, focusing on COVID-19 specific considerations including cough etiquette, hand hygiene, and distancing measures, using demonstrations and participatory methods.
- Limit the travel to only essential. Any person coming from affected areas:
    a. Should not return if showing symptoms
    b. All persons returning to the site should self-isolate themselves for fourteen (14) days following their return.
- Those who develop a high temperature or cold-like symptoms such as a runny nose or cough should not be allowed to come to work and must stay isolated.

Good Hygiene Practices

- Minimize face to face meetings. If face-to-face meetings are necessary, use a face mask and latex gloves while maintaining at least a 2m (6.5 ft) distance from each other during the meeting.
- Minimize the number of laborers and work time at sites. Maintain minimum safe distances.
- Ensure that hand wash facility with soap and water, sanitizing hand rub dispensers, and tissue papers are placed in prominent places around the workplace including toilets and entrance/exit to work areas, and are used. Make sure these dispensers are regularly refilled.
- Ensure that face masks and/or paper tissues are available and used at your workplaces along with closed bins for hygienically disposing of them (such waste should be contained in a designated area till its final disposal through incineration).
- Daily toolbox talks should discuss measures on COVID-19. Display posters promoting hand washing with soap and water (For further details please refer to (https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public) and combine this with other communication measures such as offering guidance from occupational health and safety officers/medical staff, briefings at meetings, and information through Whats-App groups to promote hand-washing with soap and water.
- All the waste such as face masks, gloves, and other items generated at the office and campsites should be stored in a labelled marked container (Hazardous Waste) and should be stored separately in isolation after disinfection. The waste once accumulated should be disposed of via EPA, a certified contractor for Incineration.

[22] During the daily briefings, remind workers to self-monitor for possible symptoms (fever, cough) and to report to their supervisor or the COVID-19 focal point if they have symptoms or are feeling unwell.

- Ensure that sufficient supplies of PPEs, tissues, and hand sanitizers are available for all workers and they use them. Have masks available to offer anyone who develops respiratory symptoms.
- Make sure that the workplaces, toilets, canteens are clean and hygienic. Cleaners should be provided with PPE and disinfectant as well as training on how to use PPEs.
- At canteens in campsites, the break times should be staggered, workers should sit about 2m apart, hand cleaning facilities and sanitizers should be provided, minimizing the exchange of currency notes, cleaning of the surface between use and immediate disposal of waste into bins should be ensured.
- The materials like steel, wood, and cloth, iron, plastic keep the COVID-19 for days, therefore, all such raw material shall be stacked separately for a few days before use to minimize the transmission or sanitized and disinfected to the extent possible before entry to the site.
- All staff must be sprayed and cleaned on returning to the camp and a wash facility has to be set up at the site gate. The guards should be instructed to enforce these measures with a request to workers to cooperate. Gloves, masks, shoes, and helmet must be left at the gate after spraying.

Workplace Practice Adjustment:

- Measures to changes work processes and timings to reduce or minimize contact between workers, (recognizing that this is likely to impact the project schedule) include:
- Decreasing the size of the work teams.
- Limiting the number of workers on-site at any one time.
- Changing to a 24-hour work rotation.
- Adapting or redesigning work processes for specific work activities and tasks to enable social distancing, and training workers on these processes.
- Continuing with the usual safety training, adding COVID-19 specific considerations. Training should include the proper use of normal PPE. While as of the date of this note, the general advice is that construction workers do not require COVID-19 specific PPE, this should be kept under review (for further information see WHO interim guidance on the rational use of personal protective equipment (PPE) for COVID-19).
- Reviewing work methods to reduce the use of construction PPE, in case of supplies become scarce or the PPE is needed for medical workers or cleaners. This could include, e.g. trying to reduce the need for dust masks by checking that water sprinkling systems are in good working order and are maintained or reducing the speed limit for haul trucks.
- Arranging (where possible) for work breaks to be taken in outdoor areas within the site.
- Consider changing canteen layouts and phasing meal times to allow for social distancing and phasing access to and/or temporarily restricting access to leisure facilities that may exist on-site, including gyms.
- As and when required, review the overall project schedule, to assess the extent to which it needs to be adjusted (or work stopped completely) to reflect prudent work practices, potential exposure of both workers and the community, and availability of supplies, taking into account Government advice and instructions.

Project Medical Services

After assessing the existing Project Medical Services, where possible, considerations should be given to expanding these services (if possible) as follows:

- As part of the organizational framework, the contractor shall appoint paramedic staff, who must also conduct training, on current WHO advice of COVID-19 and recommendations on the specifics of COVID-19. Where COVID-19 infection is suspected, medical providers on-site should follow WHO interim guidance on infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected.
- Training medical staff in testing, if testing is available.
- Assessing the current stock of equipment, supplies, and medicines on-site, and obtaining additional stock, where required and possible. This could include medical PPE, such as gowns, aprons, medical masks, gloves, and eye protection. Refer to WHO guidance as to what is advised (for further information see WHO interim guidance on the rational use of personal protective equipment (PPE) for COVID-19).
- If PPE items are unavailable due to worldwide shortages, medical staff on the project should agree on alternatives and try to procure them. Alternatives that may commonly be found on construction sites include dust masks, construction gloves, and eye goggles. While these items are not recommended, they should be used as a last resort if no medical PPE is available.
- Review existing methods for dealing with medical waste, including systems for storage and disposal [23]

Local Medical and Other Services

Given the limited scope of project medical services, the project may need to refer sick workers to local medical services. Preparation for this includes:

- Obtain information as to the resources and capacity of local medical services (e.g. number of beds, availability of trained staff, and essential supplies).
- Conduct preliminary discussions with specific medical facilities, to agree on what should be done in the event of ill workers needing to be referred to.
- Consider ways in which the project may be able to support local medical services in preparing for members of the community becoming ill, recognizing that the elderly or those with pre-existing medical conditions require additional support to access appropriate treatment if they become ill.
- Clarify how an ill worker will be transported to the medical facility, and checking the availability of such transportation.
- Establish an agreed protocol for communications with local emergency/medical services.
- Agree with the local medical services/specific medical facilities the scope of services to be provided, the procedure for in-take of patients, and (where relevant) any costs or payments that may be involved.
- A procedure should also be prepared so that project management knows what to do in the unfortunate event that a worker ill with COVID-19 dies. While normal project procedures will continue to apply, COVID-19 may raise other issues because of the infectious nature of the disease. The project should liaise with the relevant local authorities to coordinate what should be done, including any reporting or other requirements under national law.

Contingency plan

[23] For further information see WHO interim guidance on water, sanitation and waste management for COVID-19, and WHO guidance on safe management of wastes from health-care activities).

- If an exhibits symptoms of COVID-19 like high fever, he/she should be isolated immediately in the isolation room as a first step. The contractor should designate and maintain isolation and quarantine rooms.
- The Contractor should facilitate his contact with Pak Corona Helpline (+92-300-1111166) for further guidance and testing. He/She will be kept isolated till tests have been performed and the results are received. Resident laborers will use a quarantine/isolation facility while waiting for the test results. Non-resident labor should not come to work and can stay at home until the test results are received. If the results are positive, the Contractor should contact the designated hospitals to transfer the patient for quarantine and treatment. The contractor may also be needed to facilitate the transfer if hospitals request to do so. The contractor should support the cost of treatment.
- The contractor will also need to facilitate the "contact tracing" for the persons who were in contact with the patient during work at the site through their records, attendance registers, etc., and inform the authorities. This is information which authorities will ask the Contractor to provide as they will require the persons who were in contact to be isolated and tested.
- Local healthcare authorities should all be made aware of the preparations that have been made at the site.
- If a medical doctor handles the infected person for any initial first aid at the site; he should use PPEs; medical masks, gowns, apron, eye protection goggles, or face shield (respirator N95 or FFP2 standard) and boots.
- The cleaning of quarantined areas and food supplies to the quarantined/isolated persons should be ensured. PPEs must be used by all personnel responsible for these services in isolation and quarantine areas.
- Healthcare wastes produced during the care of COVID-19 patients should be collected safely in designated containers and bags, treated, and then safely disposed of.
- Preparation measures and contingency plans will be communicated widely to workers, subcontractors, suppliers, adjacent communities, nearby projects/workforces.
- If testing is available on site, the worker should be tested on-site. If a test is not available at the site, the worker should be transported to the local health facilities to be tested (if testing is available).
- If the test is positive for COVID-19 or no testing is available, the worker should continue to be isolated. This will either be at the worksite or home. If at home, the worker should be transported to their home in transportation provided by the project.
- Extensive cleaning procedures with high-alcohol content disinfectant should be undertaken in the area where the worker was present, before any further work being undertaken in that area. Tools used by the worker should be cleaned using disinfectant and PPE disposed of.
- Co-workers (i.e. workers with whom the sick worker was in close contact) should be required to stop work, and be required to quarantine themselves for 14 days, even if they have no symptoms.
- Family and other close contacts of the worker should be required to quarantine themselves for 14 days, even if they have no symptoms.
- If a case of COVID-19 is confirmed in a worker on the site, visitors should be restricted from entering the site and working groups should be isolated from each other as much as possible.
- If workers live at home and have a family member who has a confirmed or suspected case of COVID-19, the worker should quarantine themselves and not be allowed on the project site for 14 days, even if they have no symptoms.
- Workers should continue to be paid throughout periods of illness, isolation, or quarantine, or if they are required to stop work, in accordance with national law.

- Medical care (whether on-site or in a local hospital or clinic) required by a worker should be paid for by the employer. Workers will be reassured that there will be no retaliation or discrimination if they self-isolate as a result of feeling ill, and also with respect to the compensation or insurance arrangements that are in place.

Community Notification and Contact

To address the community concerns about the presence of non-local workers, or the risks posed to the community by local workers presence on the project site[24], the following good practice should be considered:

- Communications should be clear, regular, based on fact, and designed to be easily understood by community members such as Urdu, Balochi, Pushto, or graphical / visuals banners if communities are not able to read.
- Communications should utilize available means. In most cases, face-to-face meetings with the community or community representatives will not be possible. Other forms of communication should be used; posters, pamphlets, radio, text messages, electronic meetings. The means used should take into account the ability of different members of the community to access them, to make sure that communication reaches these groups.
- The community should be made aware of procedures put in place at the site to address issues related to COVID-19. This should include all measures being implemented to limit or prohibit contact between workers and the community. These need to be communicated clearly, as some measures will have financial implications for the community (e.g. if workers are paying for lodging or using local facilities). The community should be made aware of the procedure for entry/exit to the site, the training being given to workers, and the procedure that will be followed by the project if a worker becomes sick.
- If project representatives, contractors, or workers are interacting with the community, they should practice social distancing and follow other COVID-19 guidance issued by relevant authorities, both national and international (i.e., WHO, CDC).

6.2.3.2 Residual Impact

By applying the above mitigations, the impact significance shall be the very low duration of the sub-project.

6.2.4 Air Quality

A decline in the ambient air quality within the vicinity of works is expected during the construction phase activities at Sehan packages. The machinery, equipment, diesel generators, operation of batching plant, and project vehicles will be used for movement of people and construction activities such as excavation, leveling, filling of earth material, etc. Due to these activities release of exhaust emissions, containing carbon monoxide (CO), sulphur dioxide (SO_2), oxides of nitrogen (NO_X), and particulate matter (PM_{10}) is expected, which can deteriorate the ambient air quality in the sub-project sites and access roads. Furthermore,

[24] The project should set out risk-based procedures to be followed, which may reflect WHO guidance (for further information see WHO Risk Communication and Community Engagement (RCCE) Action Plan Guidance COVID-19 Preparedness and Response).

vehicular movement on unpaved tracks or katch routes may also cause fugitive dust emissions. The impact has been characterized and given in the table below.

Table 51: Impact of Characterization-Air Quality

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

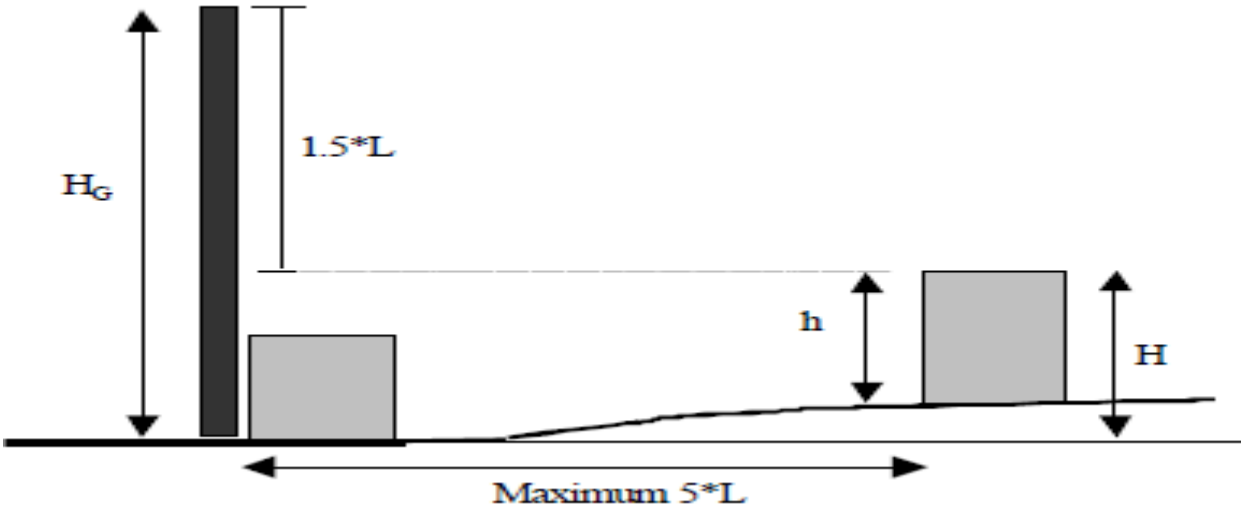
6.2.4.1 Mitigations

Ambient air quality analysis of the scheme area has been carried out to know the baseline data before the execution of the works. The existing prevailing conditions of ambient air quality are provided in section 4.1.3. The following mitigations will be used to minimize the impact.

- Contractor camps will be established at least 500 m (1,625 ft) away from communities.
- The construction machinery, generators, all equipment's and vehicles will be kept in good working condition and properly tuned, to minimize exhaust emissions. The exhaust emissions will comply with the NEQS.
- Fugitive dust emissions will be minimized by continuous water sprinkling/water spraying on the soil.
- The sub-project vehicles will avoid passing through the communities and cultivation fields as far as possible. If unavoidable, speed will be reduced to 15 km/h to avoid excessive dust emissions.
- While working within or near the communities for works such as the construction of new alignments and or structures, coordination with the communities will be maintained to minimize any detrimental impacts on the crops, settlements, or cultural values.
- Any area taken for haulage shall be taken with the permission of farmers and with a commitment to pay due to compensation accordingly.
- Diesel generation should be fitted with acoustic enclosure and stack of appropriate height for the proper dispersion of emission.

The minimum generator stack height and clearance from existing structures shall be as defined in the following figure.

Figure 12: Minimum Generator Stack Height and Clearance[25]



$H_{G=}$ 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

6.2.4.2 Residual Impact

Because of the proposed works, an increase in the levels of PM, SO_2, NO_x, and CO shall result in the degradation of ambient air quality. Through the implementation of the mitigations detailed above, the concentrations of these parameters shall not exceed the NEQS, reducing the impact magnitude to Low adverse impact in short term, and further reducing to neutral following completion of works.

6.2.5 Dust

The potential for dust emissions in the scheme area (Package 1, 2 & 3) shall be increased due to the excavation, construction activities, and clearance of vegetation. Dust shall also be generated by vehicles running on earthen haul routes. In addition, erosion of open storage piles (aggregate, fill, etc.) shall also result in an increase in dust in the area of works, as shall the operation of the batching plant.

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

The first stage of the dust emission assessment involves the identification of construction activities that have the potential to cause dust emissions and the degree of that potential. 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 52: Potential for Dust Emissions by Works Activity

Stage	Description	Potential Dust Emitting Activities	Like hood	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 regulators. 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 in the following table.

Table 53: Impact of Characterization-Dust Generation

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

6.2.5.1 Mitigations

- Water bowsers shall be used to sprinkle water to the extent of earthwork for guide bunds, and haulage routes to reduce dust emissions resulting from vehicles passing along these un-surfaced routes. This shall be the main mitigation during the project duration.
- Water sprinkling should be focused on access routes near the villages. Hard-core fill is used to repair the kacha routes to make them accessible to heavy vehicles shall also reduce the impact as the larger fill material has a lower dust raising potential. Vehicle speeds shall also be limited to 15km/hr. These

actions shall reduce the dust raising potential of these long-running activities, and if effectively implemented, this shall reduce the impact magnitude to a minor.

- The contractor shall be required to submit a traffic management plan which identifies the proposed access and haulage routes and shall be prohibited from using any routes other than those specified in the traffic management plan.
- The contractor shall be required to minimize the double handling of material during earthworks operations for the embankment strengthening.
- The contractor shall be prohibited from vegetation clearance beyond the RoW.
- Water sprinkling shall be carried out at material stockpiles where dust is generated.
- Materials delivered to sites, such as cement, loose material, sand, or aggregates shall be transported in a covered truck.

6.2.5.2 Residual Impact

By applying the above mitigations, the impact significance shall reduce to Low Adverse Impact for the duration of the works, reducing to very low following the completion of work.

6.2.6 Occupational Health and Safety

The construction phase will include various activities such as; construction of hydraulic structures, contractor camps, excavations, installation of a batching plant, earthworks, movement of various heavy machines (lorries and dumpers), manual handling during loading-unloading operation, bad housekeeping, improper storage of hazardous materials, (i.e. petrol, admixtures, etc), as a result of these works, there will be a direct impact on the health and safety of all staffs working in sub-project sites.

The potential impacts that can occur during the construction activities are presented below:

Table 54: Activities and Potential Impact

Activity	**Potential Impact *(in Worst Case)***
Earthworks	Ill health due to dust or injury/death following an accident caused due to poor visibility
Use of hazardous substances	Ill health/injury/death from improper handling
Manual handling	Injury from improper lifting
Working in the vicinity of heavy plant	Injury/ill-health due to high noise or emissions
Inhabitation of the construction camp	Ill health due to poor quality or unhygienic camps
General site works	Injury from slips and trips
Working at height	Injury/death from fall during the construction of contractor's camps, installation of batching plant.
Operation of heavy construction plant/machinery	Injury/death
Movement of vehicles and plant	Injury/death from traffic accidents

Health and safety impacts have been characterized as follows:

Table 55: Impact Characterization- Health and Safety

Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance
Direct	Short term	Reversible	Likely	Severe	High Adverse

6.2.6.1 Mitigations

The contractor shall also employ a safety officer, under this respective package who shall have the day-to-day responsibility for health and safety at each worksite in accordance with the World Bank Group General Environmental Health and Safety Guidelines[26]. He must prepare and identify:

- Emergency prevention, preparedness, and response arrangements – including details of emergency evacuation of labor following a life-threatening accident to the nearest hospitals
- Provision of security
- The contractor shall prepare a Health and Safety Plan which is relevant to his chosen methodology.
- Identification of potential hazards to workers, particularly those that may be life-threatening
- Provision of preventative and protective measures, including modification, substitution, or elimination of hazardous conditions or substances
- Training of workers
- Documentation and reporting of occupational accidents, diseases, and incidents.
- The provision of the supply of personal protective equipment shall also be mandatory for all staff and visitors.

In additions the following arrangement shall be made:

- Adequate lighting and electricity supply
- Fire prevention and fire fighting equipment
- Sheltered kitchen area (separated from living quarters)
- Proper ventilation facility with availability of electric fans
- Pedestrian routes segregated from vehicular traffic routes
- An adequate number of toilets and sanitary fittings (1 toilet, 1 hand wash basin, 1 bathroom with bench per 10 persons to be provided) located no greater than 60m from dormitories.
- Floor to ceiling partitions within sanitary facility buildings for privacy
- Lined washing areas
- Safe and reliable water supplied from tube wells that meet the national standards
- A minimum area of 4m² and one bed per person resident in a camp dormitory
- Camp building with a minimum height of 2.1m
- Appropriate protection against heat, cold, damp, noise, fire, and disease-carrying animals, in particular insects.
- Float finished plain cement washable floor for easy cleaning throughout camp buildings.
- Provision of mosquito nets
- Locks to doors and windows on camps
- Regular cleaning throughout camps

[26]https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES

- Laundry facilities
- In-house community/common entertainment facilities for foreign staff. The dependence on local entertainment outlets by foreign staff is to be discouraged.
- Drinking water
- First aid kits

The contractor shall be required to comply with the World Bank Group (IFC and EBRD) guidance note on *Workers' accommodation: processes and standards*[27], which shall be incorporated into the contract documents. This guidance note covers the following standards:

- Sanitary and toilet facilities.
- Canteens and cooking.
- General living facilities.
- Dormitory facilities.
- Nutrition and food safety.
- Medical facilities.
- Leisure, social and telecommunication facilities.

The guidelines on the details of Workers Accommodation Guidance Note (World Bank Group: IFC/EBRD) are given below:

Table 56: Workers Accommodation Guidance Note (World Bank Group-IFC/EBRD)

S. No	World Bank Group IFC Guidelines	Best Practice
1	Structures, surfaces, and installations should be easy to clean and maintain, and not allow for the accumulation of hazardous compounds	Surfaces (including flooring and work surfaces) in camps, kitchens, dining areas, and workshops should be solid and easy to clean. Flooring for work camps must be float finished concrete or better.
2	Buildings should be structurally safe, provide appropriate protection against the climate, and have acceptable light and noise conditions	The contractor's staff accommodation must be structurally sound and provided with lighting and ventilation. Accommodation must be situated at least 25m from the nearest generator
3	Floors should be level, even, and non-skid	As for #1
4	Workplace structures should be designed and constructed to withstand the expected elements for the region and have an area designated for safe refuge, if appropriate	Contractor's staff accommodation must be located such that it is not at risk from flooding
5	The workspace provided for each worker, and in total, should be adequate for safe execution of all activities, including transport and interim storage of materials and products	The Contractor shall submit to the Engineer for approval a site layout plan, identifying work areas, accommodation, kitchen, dining area, sanitary facilities, location of generators, plant and vehicle parking, transport routes through the camp, pedestrian routes through the camp, evacuation routes, emergency exits, batching plants, storage areas, waste facilities, etc.
6	Passages to emergency exits should be unobstructed at all times. There should be a minimum of two exits from any work area	Evacuation routes to be unobstructed at all times. At least two emergency exits to be provided from each building and the camp itself.

[27] Available at: http://www.ebrd.com/downloads/about/history/workers.pdf

S. No	World Bank Group IFC Guidelines	Best Practice
7	Equipping facilities with fire detectors, alarm systems, and fire-fighting equipment. The equipment should be maintained in good working order and be readily accessible.	Fire extinguishers should be provided throughout camps and work sites. Fire extinguishers should be inspected monthly and maintained as necessary
8	Adequate lavatory facilities (toilets and washing areas) should be provided for the number of people expected to work. Allowances should be made for segregated facilities or indicating whether the toilet facility is “In Use” or “Vacant”	Separate latrines and washing facilities for males and females with total isolation by a wall or by location shall be provided. Female toilets should be marked in a language understood by those using them to avoid miscommunication Suitable and sufficient washing facilities, including showers, shall be provided or made available at readily accessible places within the immediate vicinity of every sanitary facility. Washing facilities shall include a supply of clean running water, soap, or other suitable means of cleaning and towels or other suitable means of drying. Rooms containing washing facilities shall be sufficiently ventilated and lit and kept in a clean and orderly condition
9	Where workers may be exposed to substances poisonous by ingestion and skin contamination may occur, facilities for showering and changing into and out of street and work clothes should be provided	As for #8
10	Adequate supplies of potable drinking water should be provided from a fountain with an upward jet or with a sanitary means of collecting the water for drinking. Water supplied to areas of food preparation for personal hygiene (washing or bathing) should meet drinking water quality standards	An adequate and reliable supply of safe drinking water shall be made available at readily accessible and suitable places including at all camps. The Contractor shall take samples from each supply of drinking water and arrange for these to be samples to be tested at a licensed laboratory before its use by the Contractor’s staff. The results of these tests for each supply must be submitted to the Engineer and must demonstrate that each water supply meets national and World Health Organisation standards for drinking water.
11	Where there is potential for exposure to substances poisonous by ingestion, suitable arrangements are to be made for the provision of clean eating areas where workers are not exposed to the hazardous or noxious substances	The Contractor shall provide and maintain adequate hygienic kitchens that are sheltered and separated from the living quarters. Kitchens shall include raised and washable surfaces suitable for food preparation. The Contractor shall provide and maintain adequate hygienic dining areas for staff.
12	Workplaces should, to the degree feasible, receive natural light and be supplemented with sufficient artificial illumination to promote workers’ safety and health and enable safe equipment operation. Supplemental ‘task lighting’ may be required where specific visual acuity requirements should be met. Emergency lighting of adequate intensity should be installed and automatically activated upon failure of the principal artificial light source to ensure safe shut-down, evacuation, etc.	Workplaces and camps should be provided with both natural and artificial light. Artificial lighting should be powered by a generator in the event of power cuts.
13	Passageways for pedestrians and vehicles within and outside buildings should be	Pedestrian and vehicle routes are to be included in site layout plans to be submitted to the Engineer for approval

S. No	World Bank Group IFC Guidelines	Best Practice
	segregated and provide for easy, safe, and appropriate access	
14	The employer should ensure that qualified first-aid can be provided at all times. Appropriately equipped first-aid stations should be easily accessible throughout the place of work	A qualified doctor shall be appointed on-site and adequately equipped and properly staffed portable first aid stations or dispensaries shall be provided by the Contractor at camps and other strategic locations, to administer first aid treatment at any time required and free of charge to all persons on the Site, including personnel of the Engineer and the Employer. The nature, number, and location of facilities furnished and the Contractor's staff for administering first-aid treatment shall, at a minimum, meet the requirements of the Health Service of the Government of Pakistan. Dispensaries should be adequately stocked with medicines. The paramedic staff shall be available at the site all the time.

Furthermore, the ECOPS guideline given in table 10, Appendix B shall be implemented by the contractor.

6.2.6.2 Residual Impact

After the implementation of the above mitigations, the impact significance shall reduce to medium (adverse) for the duration of the works, however, it will become neutral after the completion of work.

6.2.7 Noise and Vibration

Noise and vibration will be generated because of the construction works. The main impacts will be from increased traffic along haulage routes, sheet piling, operation of batching plant, operation diesel generator. The duration of the impact will be short terms in nature. The existing noise levels in the area are below the permissible provided in NEQs. The noise levels of various equipment and machinery are given in the table below[28] .

Table 57: Noise Levels of Equipment/Machinery

Equipment/Machinery	Noise Level (dB)
Generator	<85
Bull Dozer	96
Roller	90
Grader	<85
Truck	96
Concrete Mixer	<85
Concrete Pump	<85

[28] Construction Noise, Workers Compensation Board of British Columbia

The impact characterization of noise and vibrations is evaluated as follows:

Table 58: Impact Characterization- Noise and Vibration

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

6.2.7.1 Mitigations

- The contractors working hours shall be limited to between 6 a.m. and 6 p.m, six days a week to reduce disturbance. However, the noisy activities shall only be carried out during the day time.
- Movement of vehicles and personnel will be restricted to within the work areas.
- The Community Liaison Officer shall notify affected people and communities before undertaking, especially noisy work activities and before any noise event outside of daylight hours.
- The contractor shall keep in place any acoustic guards, covers, and doors provided on the plant, generators, and vehicles and maintain all in accordance with the manufacturer's maintenance procedures to ensure good working order.
- The pressure horns will not be allowed while passing through or near communities in the sub-project area.
- The contractor shall train the operators of construction equipment on potential noise problems and the techniques to minimize noise levels.
- In the case of concrete pouring, if it is inevitable to work in the night or late hours, the contractor will seek special permission from PSIAC before carrying concrete.
- The ECOPs guideline given in table 7, Appendix B to be implemented by the contractor

6.2.7.2 Residual Impact

Following the implementation of these mitigations, the impact shall reduce to neutral in the short term and following completion of the works.

6.2.8 Loss of Vegetation and Trees

The trees and scattered vegetation cover will be removed during the construction of the Sehan channel, distributary minors, and hydraulic structures. During the survey, it was found that 395 trees are anticipated to be felled, and all these trees belong to the irrigation department. A strip of approximately 11m (36ft) will need to be cleared from the area adjacent to the existing outer toe of the embankments to allow construction of new, wider and higher, set back embankments of channel and distributary minors. 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 59: Felling of Trees

Serial No	Location	Name of tree species	Number of total trees to be cut	Package
1	Sehan channel	Babur *(Acacia Nilotica*	118	

		Ber *(Ziziphus nummularia)*	27	To be cut under Package-2
2	Distributary Minor No I	Babur *(Acacia Nilotica*	48	To be cut under Package-3
		Ber *(Ziziphus nummularia),*	16	
3	Distributary Minor No II	Al-mond *(*Prunus amygdalus)	12	
4	Sehan Channel	Babur *(Acacia Nilotica*	125	
		Ber *(Ziziphus nummularia)*	30	
		Al-mond *(*Prunus amygdalus)	19	
Total			395 number of trees to be cut. *There is no tree-cutting involved under Package-1 of the Sehan Scheme*.	

Table 60: Impact Characterization-Loss of Vegetation and Trees

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

6.2.8.1 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 (395*5=1,975) 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 PSIAC 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 PSIAC and PMU. 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 Engineer will only approve tree cutting where a complete tree inventory has been submitted to the Engineer detailing 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 Engineer and PMU, 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.

Taking into account the improvement of vegetation coverage of the scheme, and as an environmental enhancement plan, a separate community-based tree plantation plan of the sub-project area has been designed by the project under the component of “Forest sub-projects” with budget allocation under the BIWRMDP. The details are given in the table hereunder;

Table 61:Proposed Tree Plantation under the Forest Component of the BIWRMDP[29]

S. No.	Main locations of plantation	No of the plants targeted	Proposed Species
01	Sehan Channel, Distributary minors, Hydraulic Structures sites	5000	Moringa, kandi, Neem, Shisham, Jantar, Jangli, bair, Falsa, Acacia Nilotica.

6.2.8.2 Residual Impact

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

6.2.9 Surface and Ground Water Pollution

There shall be a risk of contamination to surface and groundwater resulting from bad waste management in camps and construction sites, where it is expected that large quantities of solid waste will be generated

[29] The preparation of tree plantation plan under the BIWRMDP shall be the responsibility of the PSIA, in consultation with PMU.

at construction sites. 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. During the baseline sampling total coliform, fecal coliform, Escherichia coli, level in both surface and ground water samples were found above the permissible limits of NDWQs.

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. The quality of surface and ground is already depleted in these areas and due to the unanticipated events, the impact of groundwater and surface water contamination will be further felt most severely by those nearby who depend on groundwater as their source of drinking water and domestic needs.

Table 62: Impact Characterization-Surface and Ground Water Pollution

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

6.2.9.1 Mitigations

- The contractor camp will not be located within 500 m (1,625 ft) of the community;
- The contractors of each respective package will submit their contractor environmental and social management plan which must include (camp layout and waste disposal system and obtain approval).
- Vehicles will only be washed in designated areas within each campsite;
- All fuel tanks and other hazardous material storage containers will be properly marked to highlight their contents. Hazardous material storage areas shall include a concrete floor to prevent soil contamination in case of leaks or spills and be permanently covered. Hazardous material storage areas shall be secured, and access shall be controlled;
- Fuel storage areas and generators will have secondary containment in the form of concrete or brick masonry bunds;
- 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 biodegradable domestic waste shall be disposed of in landfills established in the sub-project area or disposed of at municipal waste facilities where available;
- Landfills shall be sited at the main camp and in each sub-camp in areas where groundwater is low and, where the base of the landfill is highly permeable, the base shall be lined with an impervious layer (such

as clay) to prevent groundwater contamination. The contractor shall provide fences and secure landfills to prevent unauthorized access;

- Medical wastes will be temporarily stored on-site as hazardous material and ultimately incinerated at a medical facility;
- A sewerage system will be constructed for disposal of the wastewater from all staff and labor camps. The quality of the sewage water shall be monitored quarterly against NDWQs;
- Refueling points shall be provided with a concrete pad and bund, or drip trays shall be used to prevent soil contamination in the event of leaks or spills;
- The contractor shall submit a plan for treatment using septic systems to PSIAC 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, as during the water quality testing in the community areas microbiological contaminations was found high;
- 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.

6.2.9.2 **Residual Impact**

The baseline sampling shows that groundwater quality is already contaminated in the sub-project area. However, the contractor shall ensure that these mitigation measures are adequately adhered to at the site, reducing the level of the impact to low adverse.

6.2.10 Fauna

During the construction works there will be a possibility that the incidence of injury and killing of terrestrial and reptilian fauna could occur such as; struck by construction machinery (run over or struck by excavator bucket). It is also anticipated that noise created during the construction works may also cause a temporary impact on fauna behavior, and these may vacate the nesting areas due to noise pollution and disturbance created due to construction works, particularly, when the works are carried out at night time. In addition, illegal hunting and shooting of faunal species by working staff be possible. However, there are no major adverse impacts related to the construction phase, and the impact will be temporary.

The proposed works will require the establishment of construction and labor camps which will generate construction; domestic, sanitary, and hazardous wastes. This has also some impacts on fauna. The greatest potential impacts result from uncontrolled waste disposal and include entanglement of fauna

within solid waste and pollution of water sources due to improper disposal. The discharge of pollutants water or waste water in the Sehan River may also cause habitat destruction of Mahseer fish, after flood season in the stagnant water at low lying area or at ditches. The changes in water hydrology and flow could lead to disruption of the natural ecosystem and thus, effect the biodiversity of the area. However, since diversion channels shall be constructed to maintain the flow of water, this effect is minimized.

Table 63: Impact Characterization-Fauna

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

6.2.10.1 Mitigations

- The contractor environment officer shall survey the construction site to eliminate the potential risk of any incident to any terrestrial, reptilian, mammals, fauna species before the construction works
- On identification of any such nest, the contractor shall immediately cease works in the area and inform the Engineer and PMU. The contractor shall also 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 PSIAC to visit the site and assess the impact.
- The contractors working hours shall be limited to between 6 a.m. and 6 p.m. to avoid disturbance to fauna at Night-time.
- Low voltage lights shall be used at construction sites in the case near around nesting, breeding, and flight paths
- Waste and other hazardous substances shall be handled, stored, and treated as per the mitigation measures provided in sections 6.2.2 and 6.2.9.
- The contractor shall train the operators of construction equipment on potential noise problems and the techniques to minimize noise levels
- There shall be a ban on hunting, poaching, or trapping. The contractor's staff shall be required to sign a code of conduct prohibiting hunting, poaching, or trapping.
- Garbage will not be left in the open.
- The project staff will not be allowed to indulge in any hunting or trapping activities.
- In case any project activity is carried out in any protected area, a separate environmental study will be carried out in accordance with the Change Management.
- The measures to prevent soil and water contamination will forestall any adverse impact on the faunal resources of the area.
- As part of the CESMP, the contractor shall prepare a conservation plan to avoid any impact on these animals during construction.
- The contractor shall comply with ECoP guidelines for fauna given in table 9, Appendix B.

In case of any chance of the sensitive areas or habitat location, the contractor shall require preparing the alternative habitat management plan and implementing accordingly without any additional cost. The plan shall document the presence of affected species, the land needs of the species that may be met on the development site and shall recommend appropriate habitat management plans and other measures to protect the subject wildlife.

6.2.10.2 Residual Impact

The potential impacts of the proposed project on the wildlife of the area are expected to be moderate. By implementing these mitigation measures, anticipated impacts are expected to reduce further. The Significance of the residual impacts on the faunal resources of the area is therefore expected to be 'minor'.

6.2.11 Protected or Sensitive Areas

As stated in section 4.2.2, no protected area exists within the corridor of impact or RoW of the sub-project activities.

6.3 Social Impacts and Proposed Mitigation Measures

6.3.1 Possible Positive Economic Impacts

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

- Reduced water losses and increased water storage after the proposed construction work.
- An increase in skilled/unskilled job opportunities for area resident's skilled/unskilled job opportunities to a villager will be increased.
- This is a new roved irrigation system in the Sehan area. Therefore, benefits will directly be given to all population and villages, through the construction of new Sehan Channel and distributary minors thus supply of water to the agriculture lands at the start to a tail end, however, tail-end users will be more beneficiary for this improved irrigation system.

6.3.2 Induced Economic Development during Construction

The implementation of the scheme will potentially lead to economic development through direct and indirect investments in the area. The hiring of local labor will be prioritized and workers will benefit due to the availability of an additional source of income. This income, in turn, will hopefully lead to an increase in economic activity and contribute to local area economic development. Direct employment usually creates indirect employment (which results from increased business expenditure on goods and services including procurement of materials, equipment, and services) and induced employment (employment generated in the local and regional economy by increased spending of direct, on-site employees and indirect, supply chain, employees).

Table 64: Impact Characterization- Induced Economic Development

Nature	Duration	Reversibility	Likelihood	Consequence	Impact Significance
Direct	Short term	Reversible	Certain	Severe	Highly Positive

6.3.2.1 **Residual Impact**

The impact significance is assessed to be highly positive in the short term, reducing to neutral following the conclusion of sub-project works

6.3.3 Site Security

The project has experienced two incidents of the explosion of a landmine on an on-going World Bank funded project site in the Sibi district of NRB in January and April 2021. Keeping this in view, the project conducted a detailed security risk assessment with the need to strengthen the security measures for the project teams and equipment at all working sites of the BIWRMD project. The mitigation measures and security recommendation are provided in the security management plan and will be implemented to strengthen the security of staff, workers and project facilities. The following mitigation measures will be implemented at all work sites.

Table 65: Impact Characterization-Site Security

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

6.3.3.1 Mitigations

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

Management Steps

The following are the management steps will be adhered:

- The project shall hire a security manager (Individual Consultant) who will supervise the implementation of recommended security measures and will help the project develop further plans policies and procedures related to security for the project.
- The project shall hire the services of a professional and efficient security guarding company with an adequate number of armed private security personnel for the protection of offices, contractor camps, and work sites and will work under the supervision of the security manager.
- A system of key performance indicators will be agreed upon with the guarding service provider and strictly enforced to ensure the maintenance of service quality.
- Where possible it will be ensured that the locals or those conversant with the area and customs must be hired for the guarding duties and thorough background checks will be done by the security company before deploying any guards at the site.
- It shall be ensured that physical measures such as a fence, barriers, gates, warning signage, and surveillance system are in place to prevent access to or passage through work areas, camps, and offices.
- The project shall ensure that the security personnel should be stationed at the entry and exit points of the sites, offices, and camps around the clock.
- Perimeter walls and entry points to all facilities should be well-lit at night and where electricity is not available solar/generator-backed-up lights can be used.

- The contractor will issue cards to the staff which will be checked at the entry points. The record of all the visitors will be maintained and will be checked by the OHS staff.
- The contractor shall maintain communication through employer with local police and other law enforcement agencies in the area about his construction activities especially if the construction area is near any sensitive place and movement of staff.
- In case of any suspicious activity observed at the camp or worksite, the contractor staff shall immediately inform about the situation to the management and private security personnel. The private security personnel will immediately observe, report, and record the suspicious activity.
- In case of emergency, the private security personnel and site/camp management will contact police control, police station and patrolling parties of law enforcement agencies in the respective area to tackle the issue.
- The contractor shall not permit unauthorized person to enter the working site or camp areas. Only authorized persons will be allowed to enter the work site and in the camps.
- The contractor shall prepare emergency evacuation procedures under their health and safety management plan. Training should be provided to all staff on different emergency situations and drills should be conducted periodically.
- The emergency contact numbers of police department, fire department, nearby hospitals, rescue department shall be displayed at the camp sites and work areas.
- The project has developed a grievance redressal mechanism for the project to resolve complaints of public and project people. A public complaint centre (PCC) and a grievance redressal committee has been established for this project. The public and project staff can register their complaints related to social issues, security issues and other aspects related to project in the complaint centre. Their complaint will be received and resolved within a given time frame. The complaints which were not resolved by PCC will be forwarded to grievance redressal committee (GRC) for resolution.

Emergency Preparedness and Response Procedures

i. Emergency Evacuation & Transfer

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

ii. Emergency Drills

- All site personnel/members (PMU/PSIAC/Contractor) will follow emergency drills that shall be periodically tested through exercises. The frequency of these drills shall be every quarter which

includes fire Fighting, medical evacuation and patient transfer. The schedule of these drills shall be planned on-site in accordance with site activities and be made part of the contractor health and safety plan.

- The finding of the observations and debrief notes of the emergency drills shall be recorded. The health and safety officer shall analyze the findings and identify any remedial actions required.
- The emergency procedure shall be updated from time to time to reflect observations made.
- Training shall be conducted on regular basis for emergency response teams.
- During toolbox talk, the supervisor must emphasize how to raise an emergency and emergency response protocol associated with the work shall also be discussed with it.

6.3.3.2 Residual Impact

By applying the above mitigations, the impact significance shall be medium during the duration of the scheme.

6.3.4 Impediment to Community Movement

Community disturbance will potentially be created because of an increased volume of traffic expected within the sub-project areas during the execution of all packages, particularly at link a road towards Mekhtar Town. This, in turn, will lead to congestion on transport routes causing delays to local traffic. The contractors 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.

The impact characterization of community disturbance is given below:

Table 66: Impact Characterization-Impediment to Community Movement

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

6.3.4.1 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 en-route are to be included.
- A complaints register shall be placed at the Contractor's, PIU, and Engineer's offices to address complaints. Each contractor under their respective package will prepare their plan.
- 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 for the works shall be required to implement a traffic management plan to the approval of the Engineer and the Client to reduce stress on the transport system.
- 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 the 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 (i.e., close one of two carriageways).
- 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 and advertised.

6.3.4.2 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.

6.3.5 Disturbance to Community Mobility

An increase in traffic is expected within the sub-project areas (all packages), 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. The impact characterization of community disturbance is given below:

Table 67: Impact of Characterization-Community Disturbance

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

6.3.5.1 Mitigation Measures

- A community Liaison Officer will be appointed by the contractor to address community mobility issues.
- Route 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 for the works will be required to implement a traffic management plan to the approval of the Engineer and the Client to reduce stress on the transport system.

- The contractor will 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 15 km/hr on 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 (i.e. close one of two carriageways).
- 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.

6.3.5.2 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.

6.3.6 Community Health and Safety

As a result of the civil works and contractor camp sitting there shall be impacts on the health and safety of the local community. The potential impacts to the local communities shall be traffic incidents/accidents due to collision with a vehicle, physical injuries due to falls in excavated sites and bad housekeeping, health diseases, (i.e., asthma, skin irritation, diarrhea, hepatitis B and C, and typhoid) due to decline in air quality, exposure to hazards material (ad-mixtures chemical), bad waste management and improper disposal of sewerage waste from campsites.

Table 68: Impact Characterization- Community Health and Safety

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

6.3.6.1 Mitigations

All the work executed by or on behalf of the contractor (sub-contractor) in the performance of the work shall be in accordance with this ESMP. The contractor shall observe high standards of health and safety at all times and shall, inter alia, comply with local laws, and ensure strict adherence to the following:

- The contractor shall protect its workers and member of the community from excavations by ensuring appropriate barricading.
- The contractor's Health and Safety Plan should include plans for the emergency transfer of members of the public to suitable medical facilities in the event of a serious accident resulting from the construction works. Details of transport and medical treatment en-route are to be included.

- The contractor shall not permit casual observers close to excavating operations or work areas.
- The contractor shall provide adequate fencing around the working areas and excavations.
- The contractor shall prepare emergency shutdown procedures and evacuations to cover all staff and affected members of the public in the event of any emergency incident (such as traffic accidents and fire). The contractor shall ensure emergency access routes are well-known and have appropriate signage.
- Water sprinkling shall be carried out to suppress dust.
- Contractor shall prepare pollution prevention and control plan to protect the member of the local community and shall include:
  - Method of treatment and disposal of sanitary wastes.
  - Method for disposal of hazardous waste.
  - Actions to be taken in the event of land and water-based pollution events.
  - Procedures for the collection and disposal of wastes, including domestic and construction waste.

6.3.6.2 Residual Impact

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

6.3.7 Labor Influx

Approximately 150 laborers will be required at a different time for construction activities of all packages (50 laborers under each package). The priority will be given to local area inhabitants for skilled and unskilled labor jobs. The majority of labor needs (Skilled and Unskilled) will be met from the local area. It is anticipated that approximately 75% of the workforce will be from the sub-project area while some 25% of labor (skilled) would be hired from outside the sub-project area. This labor influx may have an impact on the social norms, culture, and economy of the area. While during the influx of labor for the construction works, guidelines given on Covid-19 in Section 6.2.3 shall be followed.

Temporary employment within the area would contribute to a reduction in the local poverty level. Increased employment for area inhabitants will also increase the skill base of those employed on the sub-project. However, labor influx from outside the local community may result in a 'squeeze' on local resources. Most importantly, there may be behavior and practices which are not considered appropriate or socially acceptable by the community resulting in conflict between the local community and the contractor's staff.

Table 69: Impact Characterization- Labor Influx

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

6.3.7.1 Mitigations

- Priority will be given to locals for skilled and unskilled jobs.
- Adequate training for 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. Priority will be given to mitigate the risk of gender-based violence (GBV), sexual exploitation, and abuse (SEA).

- 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, etc.)
- Appropriate transportation for vulnerable groups.
- Inequality, discrimination, and marginalization, including on the basis of gender and or vulnerability, is avoided.
- Establish security patrols and provided details in the CESMP.
- Strive to reduce at-risk groups' exposure to GBV and SEA violence.
- Formulation of a progressive and dynamic Labor and Manpower Policy
- Human Resource Development, focus on education, 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
- Coordination with the Provincial Governments, International Labor Organization, and other international agencies
- 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.

6.3.7.2 Residual Impact

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

6.3.8 Gender-Based violence or Sexual Exploitation and Abuse

In general, presently the prevalence of SEA/SH doesn't exist in the area but due to the influx of local and non-local labor and during the peak of construction activities under all packages, there may be a risk of gender-based violence or sexual exploitation and abuse among women and children and other vulnerable population groups (poor women, single women living alone, elderly, infirm or ill, orphans, etc). The project Grievance Redressed Mechanism (GRM) has a mandate to cover the aspects of SEA/SH in the area if occurred during the construction period. This can contribute to enduring physical and mental harm, while undercutting the ability of survivors, and often their families, to engage in meaningful, productive lives.

Table 70: Gender-based violence or sexual exploitation and abuse

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

6.3.9 Mitigation

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

To achieve the above-mentioned mitigation measures and guidelines, training will be organized and conducted on GBV and SEA at the field level.[30] These trainings will be organized for the contractor and PSIAC staff, and it will be the responsibility of the Contractor. The contractor will hire services of a qualified professional Resource Person of GBV & SEA from the open market and an agreement will be signed between the contractor and Resource Person, under the supervision of training Specialist of PSIAC. At the end of each training, the Resource Person will produce a training report and other relevant material, submit to the concerned section of PSIAC with a cumulative report to PMU and PIU. This process will complete under the overall supervision and monitoring of the Social Safeguard Specialist of PMU and Training Specialist of PSIAC sitting there for this purpose and M&E consultants.

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

[30] Gender-based violence (GBV) (with reference to WB Note on GBV available at: http://pubdocs.worldbank.org/en/399881538336159607/Good-Practice-Note-Addressing-Gender-Based-Violence.pdf

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

6.3.9.1 Residual Impact

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

6.3.10 Archaeological and Cultural Heritage Site

There is no archaeological and cultural heritage site in CoI or RoW of the sub-project areas (all packages). However, in the event of any discovery of an unidentified archaeological or cultural heritage site or resources, a chance finding procedure will be followed and implemented as given in Appendix H.

On the discovery of archaeological or cultural resources, the contractor will stop work in the area immediately. The Contractor will inform the PSIAC and PMU 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 PSIAC and copy it to PMU.

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.

6.3.11 Physical Resettlement

As there has been no change in the existing alignment of Sehan River and its associated activities, therefore, there will be no physical resettlement for the works to be carried out under this contract.

6.3.12 Land Acquisition

The 24 parcels of land have been acquired from various farmers for the construction of the Sehan Channel and two distributary minors. The 30 acres of provided land will be used for the construction Sehan channel while 09 acres of land obtained will be used for the construction of distributary minor. 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 PMU/PSIAC 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 SIAMP) 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 PMU social team, were held with community members 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 Loralai. The copies of such agreements will also be provided to affected landowners and concerned FOs. A record of VLDs will be maintained in the PMU and concerned district/tehsil revenue office. All the activities would be monitored by the PMU social safeguards staff. The signed agreement between all stakeholders is provided in Appendix D.

7 Community and Stakeholder Consultation

7.1 General

The roles of men and women in the processes of social safeguards and social mobilization as in the approved Gender Action Plan (GAP) of the project were developed to equitably participate men and women in decision-making processes and can be benefited from the whole project planned interventions. Similarly, efforts are also made to mainstreaming women in all planned project activities as the GAP has also proposed the design and implementation of specialized projects and its interventions strategically to promote active engagement of men and women with the Project. These include the designing of On-Farm Water Management schemes, Irrigation schemes, Rangeland & Watershed Management of Forest schemes, and Water Supply Schemes for Public Health Engineering departments of the Government of Balochistan to improve men's and women's practical strategic gender needs. For women exclusively, Kitchen Gardening and Tunnel Farming demos will also be a part of the project interventions which will be implemented only with them to promote income enhancement through entrepreneurial training and skill development in relevant areas as well as access to and use of technology. The activities for men and women mainly focused on awareness-raising regarding women's importance, their fundamental rights, and sensitization amongst all relevant stakeholders.

Similarly, consultations with stakeholders and the community have become standard practice in the environmental and social assessment of development projects including drinking water supply schemes. The objective of public consultation is to ensure that the sub-project proponent should share relevant information about the project interventions and the potential environmental and social impacts with all stakeholders. Consultation is a two-way process by which the knowledge and views of affected persons and other interested parties are considered for purposes of decision making. Information dissemination during public consultation by the project proponent or his representative is fundamental to meaningful consultation.
The consultations meetings were held with ***126*** *male and* ***196*** female community members in different consultation cycles. During the consultations, the locals in the sub-project area were very humble and welcoming in nature to outsiders which are reflected in successful consultation cycles. These consultation sessions were held with different stakeholder groups who may be affected positively or negatively by the proposed project. The consultation process was carried out in accordance with the World Bank's policy and guidelines. Consultations were conducted to:

- 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.

The purpose of the meetings with stakeholders was:

- To inform the farmers about the overall objectives of the project and the scope of work involved in the execution of the sub-project.
- To receive and document feedback and views of the stakeholders
- To determine the needs of community members
- To consult community member about the construction of contractor camp and other associated activities (influx of labor, construction activities, waste disposal sites)
- Develop a schedule for future consultations
- Formation of FOs and WDGs
- Walk-through surveys for identification and verification of affected landowners
- Achieving an agreement with the Farmers on VLD following the formation of FOs.

7.2 Methodology of Consultation

Consultations at the sub-projects level were done with both men and women. There have been two major rounds of consultations. To prepare the overall grounds for the project and orient the focussed communities on the BIWRMD project, formations FOs and WDGs, two rounds of consolations were held with the communities of the Sehan scheme. The first phase round of consultations was held from May to June 2020 with female folks and onward to October 2020 while the second round of consultations was held from May 2020[31] to August 2020, to share and finalize the designs of the proposed irrigation scheme, These consultations were held with both men and women of Raj Bandi, Balao Ghaffarabad/Gohar Jan, Pakistan Bashai/Laghara, Mekhtar Town, Aghbarg, Zizgay, Balao Sahib Gull/Khairudin, Alawalzai/ Mananzai, Tora Laray during the preparation of this ESMP.

At the start of the proposed activities, the response from male and female community members was not encouraging as this scheme was new for them and they didn't know about the benefits of the scheme. However, after these community consultations and orientations of the communities on the project designs and its benefits, they turn into vibratory activism towards achievements of the desired outcomes of the scheme. During the first and second meeting consultations, farmers and women community members expressed their willingness to participate in and cooperate for purposes of project implementation and execution of proposed works. Male farmers participated in the walk-through surveys to sub-project sites.

7.2.1 Details and Location of Consultation Meeting

The list of attendees of each meeting is provided in Appendix F (F.1)

Table 71: Location and date of consultative meeting with Male Community

S. No.	Location	Date
1	Inter Collage Mekhtar	23/10/2019
2	Mekhtar Killi Raj-Bandi	07/06/2020

[31] *Source: Socio-economic survey by PMU/PSIAC teams*

3	Mekhtar Killi Raj-Bandi	27/08/2020

Source: Socio-economic survey by PMU/PSIAC teams

7.3 Formation of Farmers Organization (FO)

Two FOs were formed at the main channel of the Sehan scheme. The members of each FO were elected through the participatory process and from among the local community by themselves. The list of FO members is provided in Appendix F(F.2).

Table 72: Location and date of formation of FO

S. No.	Location	Date
1	Mekhtar Killi Raj-Bandi	10/06/2020
2	Mekhtar Killi Zizgai Laghara	11/06/2020

7.4 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 73: Summary of Key Discussions

S. No.	Topic of Discussion	Measures to be Implemented
1.	How will the supply water to the tail end of the channel and distributary minors be ensured?	The supply of irrigation water to tail-end farmers of all nine villages of the Sehan scheme will be improved by the construction of the main channels and its distributaries. The structure will maximize the water flow and reduced sedimentation, therefore ensuring the Sehan channel and distributary to carry water with full discharge. The relevant FOs under the Irrigation component and WUAs under OFWM of Agriculture component are true representatives of the communities at main channel levels and channel that will be constructed in the command areas, and they will ensure a fair share of water to the tail end in an equitable manner by the active participation of all farmers. The project staff will work on the enhancement of the capacity of these organizations through proper training and on job sessions through their regular follow up visits.
2.	Contractor camp siting and associated activities	Three different contractor's camps will be established in different sites of the area and are the choice of contractors in relation to the factors including ease of access in all weather conditions, nearness to the sites, nearness to the availability and handling of materials. Environmental and Social factors will also govern the selection of the sites. On this premise, the sites identified for camp is a tentative selection and will depend on the confirmation by the contractors and concerned communities. The community members and stakeholders were informed accordingly that the contractors along with communities, PSIAC, and PIUs concerned engineering and social teams will jointly finalize the sites for the three camps locations so that there is no disturbance to the local community

S. No.	Topic of Discussion	Measures to be Implemented
		and others. The camps will be located at a safe and fair distance from communities. The waste disposal sites and access routes will be identified with the help of the community.
3.	Community disturbance during construction	Locations for contractor's camps will be constructed at least 500 meters beyond residential communities. The contractors will be required to provide complete facilities and ensure that the facilities of the community are not adversely affected.
4.	Labor Influx	Communities were informed that the hiring of local labor will be preferred to reduce labor influx. Non-local labor will be contained to camps and worksites to prevent the mixing of immigrant and resident communities, and reduce community disturbance.
5.	How will the privacy of women and children be protected during construction?	It was communicated that during construction activities, the contractors and project staff will provide all possible support to provide and use proper alternate routes for labor so that community roads are not disturbed. This is also necessary to protect the mobility and privacy of women. Moreover, to mitigate and address the risk of sexual exploitation and abuse at both the male and female sides, during the project implementation process proper awareness campaign will be held during different community meetings/training that are already planned in the project.
6.	Will buildings and structures (shops, houses, and community structures) be lost because of the Works?	The communities were informed that works only involved the construction of weir and diversion structures on Sehan river which is almost 30 km far from the local areas and villages, therefore, there shall be no impact on any community structures.
7.	Will employment opportunities be offered to the community?	The project team will emphasize to the Contractors to develop coordination with the concerned FOs members and offer joint employment to those within the community, favoring the landless who work on farmland that will be temporarily acquired during the project. The contractor will also employ a maximum number of locals in the construction work. Local labor will also be trained in different skills, during work, so that they become skilled workers for the project in question and future projects.
8.	What is the scope of work and how will the quality of work be ensured?	The FOs and Water User Associations will play their vital role with the support of the contractors and PSIAC engineer team to supervise technical aspects of the project as well as the quality of work etc.
9.	Is there a Grievance Redress Mechanism (GRM) in the sub-project?	FOs and communities of all nine villages were given a detailed orientation about the project GRM and its procedures. An Urdu description of the GRM was also provided and nomination of focal persons from communities noted.
10.	Concern about participation in Consultations?	Some community members/farmers were not present in the village during the conduction of meetings therefore, they couldn't participate. The project social team requested the other executive body members of FOs to hold meetings of the absent farmers and give orientation to them about the sub-project objective, scope of work, and the process of the BIWRMD project. The social team of PSIAC shall also contact these absent farmers and may help them to participate in future FOs meetings.

S. No.	Topic of Discussion	Measures to be Implemented
11.	Is permanent land required for the construction of channel and distributary minors?	As this scheme is new for the area and all structures will be constructed under the new irrigation system. The community was informed that there is a need for permanent land requirements for the construction of these planned activities. Therefore, 24 different affected sites are identified and lands are donated by the landowners through Volunteer Land Donation (VLD) process. The whole process was again orientated to all the community members, which was appreciated anonymously.
12.	Will water rights will be altered?	The communities were informed that this project is new for the whole area and water rights will be developed by PSIAC, However, established community water-sharing arrangements will remain the same.

7.5 Summary of Findings of Consultation with Farmers

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

7.6 Consultation with Women Community

Consultation sessions with local women were also conducted in six different locations of nine villages of the Sehan scheme at Mekhtar town . The Female Social Organizer of the project at the PSIAC level 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 Gender Action Plan, construction of watercourses planned under the agriculture component, etc.

The list of women participants is provided in Appendix F (F.3).

Table 74: Consultative meeting with Women Community

S. No	Location	Date
1	Raj Bandi Center	11/06/2020
2	Zizgai Bhetak 1	12/06/2020
3	Faqeer Muhammad bhetak	15/06/2020
4	Pakistan Bashai	16/06/2020
5	Kakar Badinzai	17/06/2020
6	Manazai Laghara	18/06/2020

Source: Socio-economic survey by PMU/PSIAC teams

7.7 Women Development Groups (WDGs)

Based on the above-mentioned theme given in para-1 of section 7.1; to support the implementation of women-related activities, it was planned that at least 40% 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 potential women 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 BIWRMDP 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 this regards, six Women's development groups respectively were formed by covering all nine villages of the command area. For this purpose, meetings were convened at the village and cluster level. The project's female social organizer at PSIAC conducted formation meetings.

In the first round of consultations, women were oriented briefly about the project development objectives of BIWRMD 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 BIWRMD project for the betterment and fulfillment of women's needs. The details of women's development groups are provided in Appendix F (F.4).

Table 75: Location and date of Meeting for the formation of WDGs

S. No	Location	Date
1	Raj Bandi Center	10/05/2020
2	Zizgai Bhetak 1	11/05/2020
3	Faqeer Muhammad bhetak	13/05/2020
4	Pakistan Bashai	14/05/2020
5	Kakar Badinzai	15/05/2020
6	Manazai Laghara	16/05/2020

7.8 Findings of Women Consultations and Priority Needs

The members of the WDGs have shared their issues which they are facing for a long time. They shared that due to the highly remote area of the province no basic necessities are available from the government for the poor women and girls. They said that in the first instance load-shedding of electricity is nowadays are on the higher side in which they are forced to fetch water from far-flung areas for drinking and domestic purposes. Secondly, the women and children are facing great difficulty in routine work after sunset, especially at the night. Third, the women, men, and children are bringing fuel from woods, bushes in the surrounding hilly areas to use for the cooking and other purposes which is a painful exercise for them and their children; they suggested the provision of GAS supply. The Women expressed great interest in initiatives for livelihood generation and requested support for the following:

- Solar panels for electricity;
- Arrangement for natural gas;
- Construction of a high school for girls;

- Drinking-Water Supply;
- Poultry farming;
- Livestock rearing and vaccination;
- Construction of separate washing places for clothing and kitchen needs.

7.8.1 Consultations with District Administration

Separate consultation meetings were held with Tehsildar, Assistant Commissioner, Deputy Commissioner, and other government representatives. In the meeting, PMU, PIU, the Irrigation Department along with PSIAC team informed the representatives of the district administration about the BIWRMD project and the proposed Sehan FIS.

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 Sehan sub-project will required lands permanently. In this regard, 24 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 Appendix F (F.5).

Table 76: Meetings carried out with District Administrations

S. No.	Location	Date
1	Deputy Commissioner	23/10/2019
3	Tehsildar	09/06/2020
5	SDO Irrigation Loralai	17/06/2020

8 Institutional and Implementation Arrangements

Baluchistan Irrigation Department (BID), GoB, will be the Implementing Agency for this sub-project. The BID will access technical expertise from the departments of Agriculture, Forestry, Livestock, and Public Health Engineering to guide project implementation. A central Project Management Unit (PMU) in BID (located at Quetta) will incorporate staff from the BID Planning and Monitoring wing and the ID Water Resource Management directorate, supplemented with 10 additional qualified staff. The Project Implementation Units (PIU) will lead the field implementation and manage the community, engagement process for the project, with PMU oversight.

The PMU is led by a Project director (PD). It will include a financial management specialist, two accountants, a procurement specialist, a communication specialist, and environmental safeguards specialist, a social safeguards specialist, a gender development specialist, a monitoring and evaluation specialist, a matching grants specialist, a training management specialist, a water resource specialist, a livestock specialist, and an agriculture specialist.

The PMU will be responsible for project implementation, including technical aspects, financial management, and procurement. Led by executing engineers, the PIUs will be responsible for the supervision of project works and activities in the river basins and community liaison and participation through COs/FOs. The PMU and PIUs will be supported by Project Supervision and Implementation Assistance (PSIAC) and Monitoring and Evaluation (M&E) consultants.

A Project Steering Committee will provide strategic guidance and facilitate inter-agency coordination. It will be chaired by the Additional Chief Secretary Balochistan and will include the Secretaries of Irrigation, Agriculture, Forestry, Public Health Engineering, Livestock and Finance departments, and Local Government. It will meet quarterly or as required to review physical and financial progress, to recommend ways to accelerate implementation, and to resolve any complaints that have been brought by the Chairman of the Grievance Redress Committee.[32]

8.1 The Contractor

The Contractor[33] of each package will be overall responsible for the implementation of the ESMP. The Contractor will be responsible for environmental protection liabilities under the Balochistan Environmental Protection Act (2012), World Bank's Environmental and Social safeguard policies, and relevant ESMP provisions. The Contractor will also be responsible for better communication and training of his crews for the implementation of the ESMP.

[32] Project Appraisal Document-PAD
[33] Each contractor of separate package

Upon mobilization, the contractor will submit to PSIAC, for approval, the Contractor's Environmental and Social Management Plans which will detail exactly how the contractor will meet the requirements of this ESMP and the contractor's Health and Safety Plan. The Contractor's Environmental and Social Management Plans will reflect the contractor's chosen construction methodologies. The Contractor will submit these plans within 30 days after award of contract and will not commence any Works until the CESMP and Health and Safety Plan are approved by the Engineer.

The Contractors specific responsibilities will include the following:

- Provide the Engineer and Employer with access to records of the environmental management program for an audit.
- Prepare and implement the CESMP, including mitigation given in this ESMP.
- Monitoring their compliance with environmental and social requirements.
- Produce a monthly report to the Employer, copied to the Engineer, which reviews the Contractor's compliance with the environmental and social requirements of this specification and the CESMP and identifies any problems.

8.2 Contractor's Environmental and Social Management Plan (CESMP) and Contractor Health and Safety Plan

Upon mobilization, and within 30 days of commencement, the contractor of each package will prepare a series of plans as part of the Contractor's Environmental and Social Management Plan (CESMP) and Health and Safety Plan which will be relevant to his chosen methodology and meet the requirements of this ESMP.

The plans shall include various management plans:

- Pollution Prevention Plan (Air/Noise/Waste/Sanitary waste management plans).
- Traffic Management Plan.
- EHS Training Plan.
- Health and Safety Plan including SOPs for COVID 19 Infection Prevention.
- Emergency Plan including SOPs for COVID 19 Infection Control.
- Contractor Layout Plan.

8.2.1 Contractor's Organisational Framework

The Contractor[34] will provide details of his organizational framework, the designation of a senior manager to take overall responsibility, and the designation of the following positions. The Contractor will provide a Curriculum Vitae for staff appointed to the positions below. These staff, must have 3 to 5 years of work experience in EHS compliance and reporting in the foreign-funded project and will meet the requirement of the contract specification and this ESMP.

[34] Each contractor will hire their own staff under organizational framework under his respective package.

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

8.2.2 Layout Plans of Contractor Camps

The Contractor will submit a layout plan for the main construction and subcamps in the CESMP. Before the construction of any camp, the Contractor will submit, to the Engineer for approval, a layout plan for the camp. All layout plans will include the following details:

- Location of landfills.
- Generators.
- Batching plants (if applicable).
- Storage areas (including hazardous material storage areas).
- Fuel tanks.
- First aid facilities.
- Waste facilities.
- Medical facilities.
- Refueling points.
- Plant wash down points.
- Water supply.
- Plant and vehicle parking.
- Measures are taken to segregate pedestrian and vehicle routes.
- Evacuation routes and emergency exits.
- Drainage.
- Camp location.
- Camp boundary.
- Work areas.
- Accommodation areas.
- Kitchens and dining areas.
- Sanitary facilities (including toilets and washrooms/showers).
- Location of sanitary treatment facilities and discharges.

9 The Environmental and Social Management and Mitigation Plan

9.1 General

Mitigation measures for the reduction of environmental degradation and social impacts, especially relating to air quality, soil contamination, pollution of water resources, loss of habitat, and disruption to wildlife will need to be implemented and monitored. Monitoring tasks will vary over the construction and operation stages of the sub-projects. Physical, biological, and socio-cultural parameters will be measured/monitored to determine compliance with national and international standards and comply with the ESMP[35] itself. The contractor of each package/sub-project (package 1, 2 & 3) is responsible for implementation of this ESMP.

Before the execution of work of sub-projects (Package 1, 2 & 3), each contractor will prepare the Contractor Environmental and Social Management Plan (CESMP) and Contractor Health and Safety Plan would be prepared and duly approved by PSIAC in coordination with PMU. Each contractor will provide its proposed social, health, safety, and environmental implementation procedures, to ensure that civil works are operating satisfactorily and that problems are being dealt with swiftly. These will be submitted to the PSIAC for review and onward submission to the PMU.

This will include the following:

- The format of a monthly report which reviews the Contractor's compliance with the environmental and social requirements of this ESMP and their plan.
- A formalized mechanism to audit the effectiveness of the own plan, (i.e., Contractor Environmental Social Management Plan)
- Details of the records to be kept demonstrating compliance with safeguards.
- Monitoring checklists for day to day monitoring with safeguards.
- A plan for day-to-day monitoring of the site and identification of staff responsible for this
- Proposed actions to be taken to correct non-compliances noted by the PSIAC.
- Internal reporting channels for non-compliances

To ensure the successful implementation of an ESMP, monitoring and supervision are considered effective tools. The level of monitoring and supervision must be appropriate. These measures are mean to reduce the risks and impacts and ensure compliances with the sub-project requirements and the procedures for documentation, reporting, and feedback on the outcomes of corrective and preventive action.

[35] All the requirement under this ESMP are applicable to contractor of each package.

Physical, biological, and socio-cultural parameters will be monitored to determine the compliance level with National, World Bank standards and compliance with this ESMP. Monitoring will be divided into Compliance monitoring and Effect monitoring.

Compliance monitoring represents the majority of the monitoring during the sub-project operational and handing over (defect notification). PSIAC along with PMU will be responsible for day to day monitoring of the contractor's compliance with this ESMP and will monitor the implementation of the mitigation measures.

PSIAC will complete monitoring within the sub-project area using contract specific monitoring checklists and will engage a full-time environmental representative to be present on-site for daily monitoring who will report directly to the Resident Engineer from PSIAC, and who will coordinate with the project management unit.

Effects Monitoring will be carried out by M&EC of various environmental and social parameters quarterly to evaluate the performance of this ESMP. The following parameters are to be monitored:

- Monitoring of Noise levels at fixed locations during the construction phase
- Availability of water at the downstream end of the channel system;
- Monitoring of ambient air quality during the construction phase;
- Health and safety of Contractors personnel.
- Monitoring for waste management and sanitary waste disposal.
- Monitoring labor management in the project area such as the process of hiring skilled and unskilled labor from the local community or other areas, no any labor rights are affected, camps are located 500 meters away from community trespass area and have an adequate boundary, contractor's training plan is implemented accordingly, no GBV or sexual exploitations are taken place, rights of women and children or any vulnerable groups are not affected.
- Monitoring of overall GRM mechanism developed in the project such as their functional committees, a database of grievances received from the communities in soft and recorded in hard in database register in writing or verbally and follow-ups status.
- Monitoring of overall VLD process as per the requirements of given RPF and its record-keeping at the community, tehsil, and PIU level.

9.2 Monitoring Mechanism

Before the execution of work, in the contractor's environmental and social management plan, each Contractor will include details of its proposed social, health, safety, and environmental implementation procedures, to ensure the construction sites are operating satisfactorily and that problems are being dealt with swiftly.

This will include the following:

- The format of a monthly report which reviews the Contractor's compliance with the environmental and social requirements of this ESMP and their own plan.
- A formalized mechanism to audit the effectiveness of the own plan (i.e. Contractor Environmental Social Management Plan).

- Details of the records to be kept demonstrating compliance with safeguards.
- Monitoring checklists for day to day monitoring with safeguards.
- A plan for day-to-day monitoring of the site and identification of staff responsible for this.
- Proposed actions to be taken to correct non-compliances noted by the PSIAC.
- Internal reporting channels for non-compliances.

9.3 Aims of Monitoring

The main objectives of the monitoring plan are:

- Evaluate the performance of the ESMP and to bring about improvements.
- To provide a means where impacts that were uncertain at the time of preparation of ESMP or unforeseen could be identified and steps are taken to adopt appropriate corrective measures.
- Record the inputs provided by various participants in the environmental and social management process, (i.e., client, consultants, contractors)
- To check whether mitigation measures are adequate, effective, and adopted in the field.
- To comply with legal and community obligations, including safety on construction sites.

9.4 Noncompliance and Corrective Measures

The Contractor will be notified of any violations with this ESMP, as well as any corrective actions required. The payment of the mobilization bill item will not be paid to the contractor until the following conditions have been met.

- Preparation and submission of Health and Safety Plan to the PSIAC in coordination with PMU for review and approval.
- Provision of contractor's staff camps.
- Preparation and submission of the contractor's Environmental and Social Management Plan to the PSIAC in coordination with PMU for review and approval.
- The contractor will submit the curriculum vitae of its ESMP staff to the PSIAC in coordination with PMU for review and approval. The availability of the Contractor's ESMP staff will be made full time on site.

Where the contractor fails to comply with his management plans, (i.e., CESMP or Health and Safety Plan) and, therefore fails to comply with this ESMP, payments will be deducted from the relevant bill item each month. The percentage deduction from these bill items will be based on the percentage compliance as measured through monthly monitoring checklists.

The following stages will be performed, relating to the increasing severity of ESMP non-compliances.

Stage 1 PSIAC discusses the problem with PMU and Contractor to work out mitigations together and record the facts and the decision implemented.

Stage 2: A more serious infringement is observed and PSIAC notifies the Contractor of the issues in writing, with a deadline by which the problem must be rectified. All costs will be borne by the Contractor.

Stage 3: PMU/ PSIAC will order the Contractor to suspend part, or all, of the works. The suspension will be enforced until the offending party, procedure, or equipment is corrected and/or remedial measures put in place if required. No extension of time will be granted for such delays and all costs will be borne by the Contractor.

Stage 4: Breach of contract - One of the possible consequences of this is the removal of a Contractor and/or equipment and/or the termination of the contract. Such measures will not replace any legal proceedings that PMU may institute against the Contractor.

9.5 Communication, Reporting, and Documentation

9.5.1 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 PMU/PIU, M&EC, PSIAC, and the contractor.

In addition to the meetings above, PSIAC (Environmental Engineer) will monitor or check the compliance status of contractor commitment on social, environmental, health, and safety-related issues. The day to day progress will be provided by the PSIAC to PMU.

9.5.2 Communications

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

9.5.3 Reporting Frequency

The Contractor and PSIAC 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 77: Distribution of Periodic Reports

S. No	Report	Prepared by	Frequency	Reviewed by	Distribution
1.	Monthly PSIAC Compliance Report ***(see report template in Appendix C)***	PSIAC	Monthly	ES PMU/PIU	PMU, Contractor
2.	Monthly Contractor's ES Mitigation and Management	Contractor's Environmental Coordinator/Officer	Monthly	ES PSIAC	PMU & PSIAC

S. No	Report	Prepared by	Frequency	Reviewed by	Distribution
	Compliance Report[36]				
3.	Monthly M&E ESMP Monitoring Report	M&E Consultant	Monthly	ES PMU	PMU and World Bank by PMU.
4.	Quarterly ESMP Progress Report	PSIAC	Quarterly	ES PMU	PMU and World Bank by PMU

9.5.4 Pictorial Record

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

9.5.5 Monthly Environmental Health and Safety Checklists

The completed monitoring checklists shall be attached to the monthly reports. The format of the monthly monitoring checklist is provided in Appendix E.

9.5.6 Complaints Register

The contractor will maintain social complaints register 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 PMU. 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.

9.5.7 Training Plan

The Contractor shall include a training plan within the CESMP which details the program for the delivery of training, demonstrating the training shall be carried out initially at the induction of staff and repeated intermittently throughout the project, to cover the subjects included in the following table.

Table 78: Training Subjects for inclusion in Contractor Training Plan

S. No	List of Topics/Training	Contents	Staff
1.	Covid-19 Pandemic (Corona Virus)	• Good Hygiene Practices • Medical Aid Facilities • Covid-19 Symptom • Precautionary measures in dealing with Covid-19 patient • Social Distancing • Needs and Benefits of Isolation or Quarantine	All Construction Staff

[36] The contractor of each respective package

S. No	List of Topics/Training	Contents	Staff
2.	Handling, use, and disposal of hazardous material	• Type of Hazardous Material and waste • Routes of Entry • Safety Labelling • Use of Safety Data Sheet • Goal and Objectives • Actions to Do and Preventive Measures • How to Avoid Injuries	All construction staffs
3.	Waste Management	• Introduction to types and waste • Solid Waste and its types • Effects of Solid waste • Waste Management concept Collection, storage, and disposal techniques What to do and what no to do	All construction staff working on regulating structures
4.	Efficient & safe driving practices, including road & vehicle restrictions	• Introduction • Causes of Road Accidents • Driving hazards • Road Journey • Vehicle inspection • Health Condition • Signposting • Competency	All staff
5.	Actions to be taken in the event of major or minor pollution event on land/Pollution Prevention	• Type of pollution and its causes • How to Avoid pollution • What to do in case of an event • Reduction Techniques • Use of tools in case of pollution • House Keeping • Impact on Human Health and Environment • Benefits	All Staff
6.	Health & Safety: Safe way to work & hazard awareness	• Objectives • Types of Hazards • Work at height procedures • Moving of machinery • Use of PPEs • Housekeeping • Hazards control	All construction staff
7.	Health & Safety: Safe use of plant & equipment	• Use of Plant procedures • Competency and training • Machine guarding • Dismantling of equipment • Daily maintenance • Safe operation • Intended use of equipment's	Operators of plant & equipment
8.	Health & Safety: Working at height	• Access and Egress, Loading Places • Ladders • Landing Places	All construction staff

S. No	List of Topics/Training	Contents	Staff
		• Openings, Corners, Breaks, Edges, and Joisting • Roof Work (Flat roofs/Sloping roofs/Steep roofs etc.) • Fragile Roofing Materials • Work over Water • Safety Nets, Belts and Harnesses • Equipment for working at height: Scaffold, MEWPS, Towers	
9.	Health & Safety: Working near/on water	• Contamination and biological/chemical hazards • Weather conditions • Hypothermia and hyperthermia • Unstable surface • Electrical hazards • Lone working • Accidental immersion • Using rescue and safety equipment • Key control measures (planning, training) • Hazards of Falling into Water • Precautions	All construction staff
10.	Health & Safety: Use of PPE	• Common Type of PPEs • Use of PPEs • Benefits • Workplace requirement of PPEs • Care and Maintenance of PPEs • When PPE is necessary • Limitations of the PPE	All construction staff
11.	Emergency procedures and evacuation	• Types of emergency • What is an Emergency plan • What is an individual role in case of emergency • Supervising Rescue Operations • Emergency reporting procedures • Means of egress	All staff
12.	Fire fighting	• Objectives • How fire starts • Use of fire extinguishers • Type of Fire extinguishers • Fire safety inspection • Competency required • Action in case of fire • Do's and Don'ts	All staff
13.	Site inductions, including requirements under the CESMP & details of environmentally sensitive areas of the site	• Purpose of induction training • Why health and safety is important • What is CESMP • What is the requirement of CESMP • Duty of care and responsibility • Your responsibility and our responsibility • Protection of Environment • What is an ecosystem • What is ecology	All staff

S. No	List of Topics/Training	Contents	Staff
		• Identification of key species • Protection of key species • Do's and don'ts • Care during the clearance of vegetation	
14.	Culturally sensitive awareness raising on HIV/AIDS and the spread of sexually transmitted diseases. Awareness-raising on risks, prevention, and available treatment of vector-borne Diseases, Cultural sensitivities of the local population	• Valuing cultural difference • Avoiding habits in other areas during migration • What are sexually transmitted diseases • Type of infection • Prevention • Strategies for controlling vector-borne diseases • Type of vector-borne diseases • Treatment procedures	All staff
15.	Awareness on cultural heritage	• Purpose of training • Awareness about cultural heritage and its importance • What to do if any cultural heritage is found the area • Prevention off cultural heritage and its techniques	All staff
16.	Gender based violence and Sexual harassment/abuse	• Objectives GBV and SH • Cultural sensitivity and tribal system of the project area • Negative impact of GBV/SH on the community and project • Code of conduct to avoid GBV/SH • Means of Conflicts due to GBV/SH • Stakeholders responsibilities	All staff, GFPs and notified GRM committees
17.	Human rights principles for security forces	• Step of ethical decision making • Dealing with misconduct and unethical behaviour • Roles and responsibilities of security personnel's • Dealing with Vulnerable groups	Security forces personnel's

9.6 Contractor's Health and Safety Plan

Upon mobilization, and within 30 days of commencement, the contractor of Package 1, 2 & 3 shall prepare a Health and Safety Plan which shall be relevant to his chosen methodology. This plan shall detail the following:

- Health and safety management structure, responsibilities, supervision, and reporting scheme
- Health and safety goals for the project.
- Identification of potential hazards (health risks, safety risks).
- Proposed measures to reduce the risk of identifying hazards.
- Arrangements to implement such measures.
- A system for reporting and investigating accidents, incidents, and near misses.
- A plan for emergency transfer of staff or public from site to medical facilities.
- Site rules.
- Fire and emergency preparedness and response plan (especially dealing with Covid-19).

- Site security.

9.6.1 Emergency Plan

The Contractor shall include an emergency plan within the CESMP which includes the following details:

- Measures for fire prevention and fire fighting.
- Indicators on site (for example, heavy rainfall) that shall prompt the shutdown of specified areas of work .
- Procedure for the shutdown of the site, including the transfer of plant, materials, and personnel to safe areas (for example in the event of a flood).
- Emergency evacuation procedures for staff and members of the public likely to be impacted by an emergency event on-site such as dealing with Covid-19, fire, or blast. The details of the Covid-19 emergency preparedness and response shall be included by the contractor in his plan, following guidelines given in Section 6.2.3.1.

9.7 Contractor's Code of Conduct

The contractor should develop conduct of conduct and ensure that each member of staff signs or provides a written explanation of why they have elected not to sign it. The contents of the Code of Conduct are as follows:

Social aspects

- Discreet sexual behavior that takes into consideration HIV/AIDS messages;
- Respect for the local community and its cultural norms;
- Presentation of professional behavior and integrity when dealing with the local community;
- Discrimination is prohibited such as gender, age, ethnic or national origin, religion, disability, sexual orientation;
- Respect privacy, particularly among women
- Inappropriate behavior such as sexual harassment, gender-based violence, and sexual abuse is strongly prohibited.

Health and Safety

- Show commitments to health and safety;
- Zero tolerance for any form of harassment, bullying, or other offensive physical or verbal treatments;
- Use of PPEs which provided;
- Attend regular training Health and safety training sessions

Environment

- No hunting and poaching of wildlife;
- Staff should not be involved in any environmental damage i.e. illegal tree cutting;
- Rules and regulations on pollution prevention and control.

9.7.1 Pollution Prevention Plan (Air/Noise/Water)

The Contractor will include a pollution prevention and control plan within the CESMP which includes the following details:

- Method of treatment and disposal of sanitary wastes.
- Method for disposal of hazardous waste.
- Actions to be taken to prevent the spill of contaminants on site.
- Actions to be taken in the event of land and water-based minor and major pollution events, including materials/equipment to be permanently based on site, regularly maintained, and to be used during a pollution event.
- Proposed methods for treatment of concrete batching plant washout water (if applicable), to include as necessary, flow and load equalization, pH adjustment, and sedimentation using settling basins or clarifiers.
- Procedures for the collection and disposal of wastes, including domestic and construction waste.

9.7.2 Traffic Management Plan

The Contractor must provide the following information regarding the traffic management plan within his document:

- Loading/unloading points for deliveries, plant, and vehicles at the construction camp.
- Access routes around the site for the transfer of materials and personnel.
- Proposed access/haul routes.
- Access routes for deliveries to and from the main camp.
- Queuing points for delivery vehicles.
- Locations and details of warning signs to be erected on public roads.
- Locations where banks-men will be provided (if required).

9.8 Criteria for the Approval of Contractor Documents

Once the CESMP and CHSP are submitted to the PSIAC, these documents will be reviewed by PSIAC along with PMU in the context and requirements of this ESMP. If any changes are required, the contractor will be given written comments to make the required changes and re-submit the revised version for review and approval. Approval will be accorded by the Engineer with the consent of the PMU if both have been met the requirements of this ESMP.

9.9 The Environmental and Social Monitoring and Mitigation Plan

The following table includes details of the mitigation and monitoring activities with relative agencies responsible for those actions during the implementation of this ESMP and civil works execution by the contractor of Package 1,2 and 3.

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
	8. Covid-19 (Corona Virus)									
1.1	COVID 19 (Corona Virus)	Spread of Corona Virus during the implementation phase of the sub-project	The guidelines and mitigations given in section 6.2.3.1 and SOPs in Appendix I shall be implemented and followed by the contractor	PMU, PIU, PSIA	Through the sub-project location (i.e Work areas, campsites	Daily	Monitoring of sick person or suspected patient. Social distancing is observed Face masks and gloves are worn all the time. Hand washing for 20 seconds is being carried out several times a day. Hand sanitizers are available at the campsite and work locations and are being used. Hygiene Hygiene practices are being maintained.	✓	✓	✓

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
1.2	Handling and disposal of Covid-10 waste	Chances of getting an infection while handling Covid-19 waste	waste such as latex gloves, face mask, tissue papers shall be disposed of in top covered waste bins Waste bins shall be marked with Covid-19 waste. All this waste shall be collected with appropriate safety measures and be transported to the burning pit away from the campsite and community. Provide training to staff on safe of use of PPE while handling Covid waste	PMU, PIU, PSIAC	Through the sub-project location (i.e Work areas, campsites	Daily	Waste collected in separate top covered waste bin The burning pit is located away from the local community and camp area. Appropriate safety measures are taken while collecting covid waste Training provided on safe use and removing PPE after work.	✓	✓	✓
1.3	Emergency preparedness response plan	Transfer of suspected patients/workers to the hospitals	The contractor's Health and Safety Plan should include plans for the emergency transfer of members of the workers to suitable medical facilities in the event of Covid medical emergency Display emergency contact numbers clearly and prominently in strategic places in camps. Provide a transport facility for the laborers during an emergency to be transported to the nearest hospitals.	PMU, PIU, PSIAC	Through the sub-project location (i.e Work areas, campsites	In case of emergency	Emergency contact number displayed. Training on Covid-19 emergency procedures is provided.	✓	✓	✓
9. Traffic Management										
2.1		Air pollution	Regularly service vehicles			Quarterly				✓

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
	All traffic movements		Limit particulate matter emissions from vehicles to less than 100 mg/Nm³	Contractor	All Sub-Project area		Air quality at any inhabited area within the sub-project area to meet NEQS and EHS guidelines for ambient air			
			Limit sulfur dioxide content from vehicles emissions to less than 3%							
			Limit nitrogen oxide emissions from vehicles to less than 1,460 mg/Nm³							
			Provide training in fuel-efficient driving practices for drivers.		-	At the commencement of works	Training identified in the contractor's training plan	✓		✓
						Quarterly	Training delivered as per training plan	✓		✓
		Soil and groundwater pollution	Inspect vehicles regularly for leaks		Sub-Project area	Monthly	No leaking oil or fuel observed from plant or vehicles	✓	✓	
2.2	Movement of plant and equipment on public roads	Increase in traffic around the sub-project areas	Prepare a traffic management plan detailing proposed routes to access the site	Contractor	All sub-project sites	At the commencement of works	Traffic management plan submitted and approved by Engineer (including details of proposed access routes to project area)	✓		
			Prohibit pressure horn and prevent excessive noise levels from the contractor's vehicles	Contractor	Sub-Project area	Quarterly	Noise emissions from plant and vehicles within NEQS and EHS guidelines			✓
		Safety of workers and public	Obey speed limits of public highways	Contractor	Public highways	Monthly	Contractor's vehicles not exceeding highway speed limits	✓	✓	✓
			Provide barricades, flagmen, and signs where haulage routes on private land intersect public highways	Contractor	Where haulage routes cross public highways	Monthly	Barricades, flagmen, and signs provided	✓		
			Clean mud from vehicles before entering public highways or regularly sweep the road	Contractor	Public highways	Monthly	No mud observed on roads	✓	✓	✓

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
		Damage to public infrastructure	Obey height & weight restrictions	Contractor	Public highway	Monthly	Vehicles are not overloaded	✓	✓	✓
			Repair ruts and scars resulting from contractors operations (at contractors cost)	Contractor	Public highways	Monthly	Ruts and scars not observed	✓		
2.3	Deliveries	Blockage of traffic on access routes and public roads	Prohibit delivery vehicles from queuing on public highways Load & unload vehicles off public highways Maintain one-way traffic with speed restrictions Provide flagmen, warning signs, and barricades to protect staff	Contractor	Camp, structure sites, and access roads of public	During deliveries	No delivery vehicles parked on public roads	✓		
		Air pollution	Prohibit running of engines while vehicles are waiting	Contractor	Camp and public roads	During deliveries	Delivery vehicle engines turned off while waiting for loading/unloading	✓		
2.4	Haulage of construction materials	Dust	Cover bed of haulage vehicles when transporting loose and/or fine materials	Contractor	Haulage routes	During deliveries	No dust observed from the bed of haulage vehicles near settlements or active agricultural land	✓		
2.5	Transport in the sub-project area	Damage to access roads, drains & embankments	Promptly repair any damage caused by the Works	Contractor	Haulage & access tracks	Monthly	No damage to access roads drains or embankments observed	✓		
		Safety of all staff & public	Limit speed of plant and vehicles on-site to 15km/hr	Contractor	Haulage & access tracks	Monthly	Speed of plant & vehicles not exceeding 15 km/hr	✓	✓	✓

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
		Damage to crops, pasture, and injury to livestock	Access & haulage routes included in the Traffic Management Plan and enforcement of the plan Minimize damage to crops, pasture, woodland, and livestock	Contractor	Access routes to channels	During Works	Traffic management plan submitted and approved by Engineer (including details of proposed access & haul routes throughout the project area and to borrow areas) No damage or harm, to crops, pastures, and livestock	✓		
		Dust	Regular water sprinkling of katcha tracks focused near settlements and active agricultural land	Contractor	Haulage & access tracks	Monthly	Low dust levels from haulage & access routes close to communities and active agricultural land	✓	✓	
	Site Access to reach work stations	Impact on Fauna Behaviour	Appoint Biodiversity specialist to prepare mitigation hierarchy (avoid, mitigate, compensate) and design/refine measures for fauna	Contractor/M&E C team/PIU/PMU	Site Access routes or new construction routes, if required	Weekly	Short term Biodiversity appointed to prepare a mitigation plan before construction of new access routes if required,	□	□	□
	3. Batching Plant & Excavation									
3.1	Operation of batching plant	Noise	The batching plant shall be installed 500 meters (1625 ft) away from community areas Maintain & operate the plant as per the manufacturer's guidelines.	Contractor	Main Camp	During the installation of the batching plant	No community disturbance is caused. Acoustic guards, doors, and hatches supplied on the rig are closed Noise levels are within the NEQs limit	✓	✓	

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
		Disturbance to the community	Plan all work to be completed within the hours of 6 am and 6 pm	Contractor	Main Camp	Monthly	No work undertaken from 6 pm to 6 am	✓	✓	✓
		Air pollution	Install new or highly maintained batching plants Regularly service plant Install fabric filters, cyclone control, or wet scrubbers if necessary to ensure particulate matter emissions from batching plant do not exceed 500 mg/Nm³ Reduce the distance between silos and containers when filling with cement	Contractor	Main Camp	Quarterly	Air quality at any inhabited area within the sub-project area to meet NEQS for ambient air. No cement dust emitted while filling containers	✓	✓	✓
3.2	Washing down plant & equipment	Ground, groundwater, and surface water pollution	Wash down only in designated and bunded wash down areas. Separate oil and cement from effluent and dispose of hazardous effluent at a licensed site In addition, concrete washout must be diluted by the addition of more water and then can be used for water sprinkling. Further treatment of wash down, if necessary to meet NEQS, using flow and load equalization with pH adjustment and/or sedimentation of suspended solids using settling basins or clarifiers	Contractor	Main Camp & subcamps	Monthly	Bunded wash down areas provided Plant & equipment not washed down outside wash down areas Disposal of hazardous effluent at a licensed site Effluent water quality meets NEQS for municipal and liquid industrial effluent Groundwater meets NEQS for drinking water, except for parameters where baseline water quality did not meet NEQS.	✓		✓

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
3.3	Civil works and earth excavation	Disturbance/harm to seasonal fauna	The contractor environment officer shall survey the construction site to eliminate the potential risk of any incident to any terrestrial, reptilian, mammals, fauna species before the construction works The contractor shall comply with ECoP guidelines for fauna As part of the CESMP (Contractor Environmental and Social Management Plan), the contractor shall prepare a plan /SOP to avoid any impact on flora/fauna during construction	Contractor	All work areas	During earth excavation at structural sites	Development of SOPs/Plan for protecting biodiversity in CESMP	✓	✓	✓
	4. Storage of Construction Materials									
4.1	Locating the storage area	Ground, groundwater, and surface water pollution	Locate storage areas away from watercourses, drains, and transport routes	Contractor	Campsites	Monthly	Construction materials not entering watercourse drain or being spread along transport routes	✓	✓	✓
			Protect storage areas from flooding	Contractor	Campsites	Monthly	Storage areas above flood levels	✓	✓	✓
			Storage areas marked on the camp layout plan	Contractor	-	Before camp establishment	Camp layout plan approved by PSIAC	✓		
4.2	Use of storage areas	Ground, groundwater, and surface water pollution	Ensure only designated storage areas are used	Contractor	Campsites	Monthly	No materials stored outside storage areas	✓	✓	✓
			Mark storage areas and label containers	Contractor	Storage areas	Monthly	Storage areas and containers clearly labeled	✓		✓

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
4.3	Storage of cement	Pollution The health of staff & public	Store within sheds, under polythene sheets, or in unopened bags	Contractor	Campsites	Monthly	Cement dust not observed	✓	✓	✓
4.4	Storage of sand	Dust	Cover with polythene sheets or store within sheds during times of high wind Employ water sprinkling if airborne particulate matter increases around the sand stockpile	Contractor	Campsites	Monthly	Sand from stockpile not spread by wind	✓	✓	✓
	5. Hazardous Materials									
5.1	Storage of hazardous material (i,e., petroleum products, batteries, ad-mixture chemicals, including waste)	The health of staff & public	Lock & secure hazardous material storage area to prevent unauthorized access	Contractor	Storage areas	Monthly	Hazardous storage areas locked and secured when not in use	✓	✓	
			Display warning signs depicting hazards and PPE required at the entrances to hazardous material storage areas	Contractor	Storage areas	Monthly	Warning signs displayed at the entrance to hazardous material storage areas	✓	✓	
		Fire	Provide fire extinguishers at hazardous material storage areas	Contractor	Storage areas	Monthly	Fire extinguishers provided	✓	✓	
		Ground, groundwater & surface water pollution	Provide hard compacted, impervious, and bunded flooring to hazardous material storage areas	Contractor	Storage areas	Monthly	The floor of hazardous materials storage is impervious	✓		
							The bund is provided around the hazardous material store	✓		
			Label each container indicating what is stored within	Contactor	Storage areas	Monthly	Each container is labeled indicating what is stored	✓	✓	
			Store containers with clearance around each to facilitate inspection of containers	Contractor	Storage areas	Monthly	No leaks observed	✓		

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
			Regularly check taps, hoses, lids & containers and dispose of damaged containers	Contractor						
			Provide spill kits and ensure staff are trained in their use	Contractor	Storage areas	Monthly	Spill kits provided at storage areas and around work sites	✓	✓	
			Hazardous material storage areas to be covered	Contractor	Storage areas	Monthly	Hazardous material storage areas are covered	✓		
5.2	Bulk storage of fuel	Ground, groundwater & surface water pollution	Contain fuel within double-skinned bowser or surround container by a bund to the capacity of container on hard compacted flooring	Contractor	Fuel storage area	Monthly	Fuel stored in double skinned bower or surrounded by bund on impervious floor	✓	✓	
5.3	Handling of hazardous materials	Health & safety of staff	Train staff in safe handling techniques Enforce the use of all necessary PPE	Contractor	All sites	Monthly	Necessary PPE is used when handling hazardous material	✓		
		Ground, groundwater & surface water pollution	Train staff in pollution control measures Lock valves and trigger guns when not in use	Contractor	All sites	Monthly	No spills of hazardous materials observed	✓	✓	
5.4	Plant and vehicle wash down	Ground, groundwater & surface water pollution	Contractor to identify designated wash down areas in the camp layout plan	Contractor	Contractors Camp	Before the construction of each camp	Wash down areas identified in the camp layout plan	✓		
			Wash-down points will have a concrete pad underneath	Contractor	Wash down points	During camp establishment	Concrete pad provided at wash-down points	✓	✓	✓

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
			Mobile plant washed down only at designated wash down areas Treatment of wash down effluent before disposal	Contractor	All Campsites	Quarterly	Mobile plant using wash down areas Treatment and disposal methodology for wash down effluent included in Contractor's Pollution Control Plan Effluent disposal quality meets the NEQs limits Groundwater quality meets should be in NEQs limit for drinking purpose	✓	✓	
			Separate oil from effluent and dispose of hazardous effluent at a licensed site	Contractor	Wash down points	Monthly	Disposal of hazardous effluent at a licensed site	✓	✓	
5.5	Refueling	Groundwater & surface water pollution	Refuel in designated and bunded areas only over impervious flooring or provide drip trays	Contractor	All sites	Monthly	Plant refueling only in designated and bunded areas or provide drip trays	✓		✓
5.6	Disposal of hazardous waste	Groundwater & surface water pollution	Identify and Transport hazardous waste to an approved disposal site (include details in Pollution Control Plan)	Contractor	-	Before commencement of works	Approval of Pollution Control Plan by the Engineer	✓		
					All sites	Monthly	Disposal of hazardous waste at approved sites	✓		
			Medical waste is stored and disposed of as hazardous waste.	Contractor	Landfills	Monthly	Medical waste not disposed of in landfills	✓	✓	✓

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
	6. Waste Management									
6.1	Locating landfill	Ground & groundwater pollution	Site landfill in an area where groundwater is low, and if not possible, line landfill with an impervious layer (such as clay)	Contractor	Landfill	Monthly	Water not observed in the landfill	✓	✓	✓
		Community disturbance & public safety	Locate landfill 300m (1,625ft) away from existing settlements (to be identified in Camp layout)	Contractor	-	Before establishment	Approval of camp layout by Engineer	✓		
6.2	Collection of domestic waste	Soil, groundwater, and surface water pollution	Provide garbage bins at a radius of 50ft at the main camp and 100ft in temporary and subcamps for collection of domestic waste	Contractor	All camps	Monthly	No littering of campsites	✓	✓	✓
		Odour & community disturbance	Regular collection & disposal of domestic waste	Contractor						
6.3	Disposal of biodegradable domestic waste	Soil, groundwater, and surface water pollution	Dispose of biodegradable waste at designated landfill or compost area	Contractor	All camps	Monthly	Landfilling or composting of biodegradable waste	✓	✓	✓
6.4	Disposal of non-biodegradable & non-recyclable waste	Soil, groundwater, and surface water pollution	Dispose of non-biodegradable, non-recyclable waste at the designated landfill, licensed disposal site	Contractor	All camps	Monthly	Landfilling, transfer to a licensed disposal site, or incineration of non - biodegradable, non-recyclable waste	✓	✓	✓
6.5	Disposal of recyclable waste	Loss of resources	Sell recyclable waste to local vendors (where available)	Contractor	Landfill	Monthly	Recyclable waste sold to local vendors (where available)	✓	✓	✓
6.6	Generation of sanitary waste	Soil, groundwater, and surface water pollution	Provide latrines at camps & prohibit staff from fouling the camp	Contractor	All camps	Monthly	Regularly cleaned latrines provided at all camps	✓	✓	✓
6.7	Incineration of waste	Air pollution	Do not burn materials which may result in the release of toxic or hazardous substances	Contractor	Incineration site	Quarterly	Air quality at any inhabited area within the sub-project area to meet NEQS for ambient air			✓

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
		Spread of fire	Provide fire extinguishers at incineration site	Contractor	Incineration site	Monthly	Fire extinguishers placed at incineration site	✓	✓	✓
			Do not burn on-site when surrounding vegetation is dry and combustible	Contractor						
6.8	Generation & collection of construction waste	Loss of resources	Reuse construction waste where suitable	Contractor	Sub-Project area	End of works	All construction waste removed	✓	✓	✓
		Visual impact & soil pollution	Remove all construction waste from the project area	Contractor						
6.9	Disposal of medical waste	Health & safety of staff & public	Incineration at a nearby hospital (or equivalent facility)	Contractor	Landfill	Monthly	Medical waste not disposed of in landfill	✓	✓	✓
	7. Construction of Health & Safety									
7.1	General construction activities	Health & safety to staff\Incident Handling	Qualified Health & Safety officer and site safety supervisor must be present all the time at the site. And shall be responsible for the health & safety of staff	Contractor	-	Before works commence	The CV of appointed Health & Safety officer and site safety officer approved by Engineer	✓		
			All necessary PPE provided to staff and its use enforced, particularly the use of safety belts while working at the site.	Contractor	All work sites	Monthly	All necessary PPE is worn by all staff	✓	✓	✓
			Provide training to staff in the safe use of equipment & plant, use of PPE, and handling of hazardous materials. Training shall include hazards of their work, hazard awareness, safe work practices, and emergency procedures in case of fire	Contractor	-	At the commencement of work	Approval of Health & Safety Plan by Engineer & inclusion of training plan	✓		
			No staff shall be allowed on the site who has not undergone induction training	Contractor	Entire sub-project area	Monthly	Induction provided to all staff	✓	✓	✓

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
			A qualified paramedic shall be engaged on-site and adequately equipped and properly staffed portable first boxes or dispensaries provided by the Contractor	Contractor	Entire sub-project area	Monthly	Paramedic staff is employed and first aid stations provided	✓	✓	✓
			Identify potential hazards and provide preventative measures to reduce the risk of accidents In case of an incident, the person shall be given a first-aid facility and ambulance service to the nearest hospital.	Contractor	-	Monthly	No accidents	✓	✓	✓
			Document & report accidents, diseases & incidents	Contractor	-	Monthly	Cause of accident or disease identified and measures implemented to prevent reoccurrence	✓		
7.2	Appointment of labor	The exploitation of local communities	Do not hire children of less than 18 years old. CNIC is issued to persons over 18 years. Those labor we be hired who have CNIC card, as it also requirement of employment. Do not hire pregnant women, or women who have delivered a child within 8 preceding weeks.	Contractor	Entire project area	Monthly	No staff is employed who are under the age of 18 or pregnant women.	✓	✓	✓
			8. Staff, Labour & Construction Camps							
8.1	Locating Camps	Community Disturbance	The contractor shall enter into a signed and witnessed agreement with the owner of the land at which he wishes to establish camps	Contractor	-	Before camp establishment	Signed and witnessed agreements in place for each campsite situated in private land	✓		

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
			Locate camps at least 500 meters (1625ft) from communities	Contractor	Camp Locations	Before camp establishment	Camp location at least 500m (1625ft) from the nearest community	✓		
			Appoint a Community Liaison Officer within Contractors staff	Contractor	-	Before works commence	Community Liaison Officer appointed	✓		
		Loss of flora & fauna Surface water pollution	Locate camps away from the embankments of watercourses Submit layout plans for each camp to the approval of the Engineer before construction of the camp	Contractor	Camp Locations	Before camp establishment	Construction of campsites do not begin before approval of the layout plan	✓	✓	✓
		Acquiring Private Land for Contractor Camp Construction	In case the land is taken from a private individual or public entity the contractor has to sign a temporary lease agreement and will follow the Project's RPF for meeting such land needs.	Contractor	Camp Locations	Before camp establishment	Community Liaison Officer	✓	✓	
8.2	Vegetation clearance	Disturbance to Flora and fauna	The Contractor shall take full care to preserve and protect from damage native shrubbery & vegetation	Contractor	Camp Locations	At the time of the camp establishment	Minimal unnecessary damage to vegetation	✓	✓	✓
		Loss of ground vegetation	Contractor to train staff engaged in vegetation clearance.	Contractor	-	Before commencement	Training in species identification included in the contractor's training plan	✓		
		Landscape change	Before vegetation clearance, a record of the pre-project landscape situation shall be taken	Contractor	Camp Locations	Before camp establishment	Photographs of the camp areas taken	✓		

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
			The Contractor shall reinstate the camp area to the original form upon completion of works.	Contractor	Camp Locations	Once after removal of each campsite	Removal of all camp facilities (including fences)	✓	✓	
8.5	Tree Cutting by Contractor Staff	Loss of habitat	Supply fuel (gas cylinders) in work camps and supplement with training to prevent labor from felling trees	Contractor	camp locations	Monthly	Cooking fuel supplied and training delivered in their use at labor camps	✓	✓	✓
8.5	Provision of the drainage line	Flooding of the campsite Unsanitary living conditions & spreading of disease	Drainage provided & maintained in camp sites	Contractor	All camp Locations	Monthly	No stagnant water accumulating in or around camps	✓	✓	
8.6	Provision of camp facilities	Health, safety & wellbeing of the workforce	Provision of electricity supply, lighting, and electric fans.	Contractor	All camp Locations	Monthly	Reliable electricity supply, lighting, and fans provided	✓	✓	
			Provision of fire prevention & fighting equipment	Contractor	All camp Locations	Monthly	Fire extinguishers provided	✓	✓	
			Provision of sheltered kitchen area separated from living quarters	Contractor	All camp Locations	Monthly	Provision of sheltered kitchen separate to living quarters & adequately ventilated	✓	✓	
			Provision of dormitories providing at least 4m² per resident	Contractor	All camp Locations	Monthly	Dormitories provided with at least 4m² floor space per resident	✓	✓	
			Provision of canteens with a minimum floor space of 1.25m² per worker using canteen at any time	Contractor	All camp Locations	Monthly	The canteen provides at least 1.25m² floor space per worker using the canteen at any one time	✓	✓	
			Provision of roads & paths	Contractor	All camp Locations	Monthly	Segregation of traffic and pedestrians in camp	✓	✓	
			Provision of safe & reliable water supply	Contractor	All camp Locations	Monthly	Provision of drinking water as per NDWQs	✓	✓	

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
			The Contractor shall maintain and cleanse sufficient latrines for use by his employees and ensure employees do not foul the camp/site	Contractor	All camp Locations	Monthly	Clean latrines	✓	✓	
			Treatment/disposal facilities for sewage	Contractor	-	At commencement	Method for treatment of sewage to be included in the contractor's Pollution Control Plan		✓	
				Contractor	Main camps	Monthly	Sewage treated before disposal	✓	✓	
				Contractor	Temporary & sub-camps	Monthly	Sewage disposed of through septic and burial	✓	✓	
			The Contractor shall nominate a qualified Health & Safety Officer and shall prepare and implement the Health and Safety plan	Contractor	-	At commencement	The nomination of Health & Safety Officer	✓	✓	
8.5	Hunting by Contractors staff	Disturbance to, and loss of, wildlife	Hunting, poaching, or trapping of wildlife/game is strictly prohibited and shall be included in a Code of Conduct to be signed by all Contractors Staff	Contractor	-	During the commencement of work	Code of Conduct prepared and signed by all staff		✓	
8.6	Provision of drinking water	Depletion of local water resources	Contractor shall make his arrangements for water supply for use by his staff and in construction and install tube wells and hand pumps where required	Contractor	Camp Locations	Monthly	Water is not abstracted from local water sources such as well or hand pumps		✓	✓
8.7	Provision of generators	Air pollution	Install fabric filters, cyclone control or wet scrubbers if necessary, to ensure particulate matter emissions from batching plant do not exceed 300 mg/Nm³ (measured at source)	Contractor	Residences close to campsites	Quarterly	Air quality at any inhabited area within the sub-project area to meet NEQS for ambient air			✓

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
			Use low sulphur fuels and sorbent injection as necessary to reduce sulphur dioxide in ambient air to below 120µg/m³ (average measured over 24 hours)	Contractor	Camp Locations	Quarterly	Air quality at any inhabited area within the sub-project area to meet NEQS for ambient air			✓
			Use of catalytic or non-catalytic reduction techniques as necessary to reduce oxides of nitrogen to below 80µg/m³ (average in ambient air measured over 24 hours)	Contractor	Camp Locations	Quarterly	Air quality at any inhabited area within the sub-project area to meet NEQS for ambient air			✓
			Install generator stack at the location and of height as per World Bank Group, IFC EHS guidelines.	Contractor	Camp sites	At the establishment of the camp	Generator stack installed as per World Bank Group IFC requirements.		✓	✓ ✓
8.8	Sewage Waste	Water pollution	Treatment/disposal facilities for sewage	Contractor	Camp Locations	At the commencement of Work	Method for treatment of sewage to be included in the contractor's Pollution Control Plan		✓	
						Monthly	Sewage treated before disposal	✓	✓	✓
						Monthly	Sewage disposed of through burial	✓	✓	✓
Dismantling Associated Facilities										
9.1	Demolition/ Dismantling of associated activities	Impact on human health due to improper disposal of biodegradable waste such as the spread of health diseases and waste eaten by faunal species	Biodegradable waste shall be composted/buried in the ground at the approved landfill site.	Contractor	Entire Project area	Monthly (after completion of engineering works)	Landfilling or composting of biodegradable waste and is not disposed off on the ground	✓	✓	✓

Table 79:Environmental Mitigation and Monitoring Plan

Items	Activities	Environmental Impact	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
		Surface and groundwater pollution	Liquid waste should be buried in a designated sanitary landfill which to be built by Contractor and after treatment, as per the design approved by the Engineer	Contractor	Contractor Campsite and associated facilities	Monthly (after completion of engineering works)	Sanitary or liquid is not disposed of in an open environment and without treatment.	✓	✓	✓
		Depletion of Air Quality	Recyclable waste to be handed over to recycling contractors. Combustible waste to be burned in a burn pit or incinerator. Medical waste to be incinerated at nearby hospital incinerator, if any, or an equivalent facility.	Contractor	Contractor Campsite and associated facilities	Monthly (after completion of engineering works)	Air quality at any inhabited area within the sub-project area to meet NEQS for ambient air. Medical waste is not disposed of in a landfill.	✓	✓	✓
		Demolition Waste and excessive construction material	Almost all construction and demolition waste are capable of being recycled, providing the waste is segregated and separated. The recycled materials can then go on to be used for aggregate formation, landscaping, and road construction. Excessive construction material to be sold back or given to the supplier or other users.	Contractor	Sub-project area	Monthly (after completion of engineering works)	Demolition waste is not kept unattended is removed from the site. Excessive construction materials are taken back by the supplier.	✓	✓	✓
Site Security										

10.1	Security threat	Unpeacful work environment Threat of unwanted incident/accident that may lead to stoppage of work and injuries/deaths	• The project shall hire a security manager (Individual Consultant) who will supervise the implementation of recommended security measures and will help the project to develop further plans policies and procedures related to security for the project. • The project shall hire the services of a professional and efficient security guarding company with adequate number of armed private security personnel for protection of offices, contractor camps and work sites and will work under the supervision of security manager. • A system of key performance indicators will be agreed with the guarding service provider and strictly enforced to ensure maintenance of service quality. • Where possible it will be ensured that the locals or those conversant with the area and customs must be hired for the guarding duties and thorough background checks will be done by the security company before deploying any guards at site. • It shall be ensured that physical measures such as a fence, barriers, gates, warning signage, and surveillance system are in place to prevent access to or passage through work areas, camps, and offices. • The project shall ensure that the security personnel should be stationed at the entry and exit points	PMU	Work areas and Camp site	Monthly basis	Communication carried out with LEAs. Emergency Preparedness and Response Procedures prepared and included in CHSP. Risk assessment conduct and included CHSP Walk through surveys conducted on daily basis before commencement of work activity Security guard hired and available all the time at site Emergency drills are conducted as per schedule given in CSHP Assembly area marked and visible Trainings provided.			✓

			of the sites, offices, and camps around the clock. • Perimeter walls and entry points to all facilities should be well lit at night and where electricity is not available solar/generator backed up lights can be used. • The contractor will issue cards to the staff which will be checked at the entry points. The record of all the visitors will be maintained and will be checked by the OHS staff. • The contractor shall maintain communication through employer with local police and other law enforcement agencies in the area about his construction activities especially if the construction area is near any sensitive place and movement of staff. • In case of any suspicious activity observed at the camp or worksite, the contractor staff shall immediately inform about the situation to the management and private security personnel. The private security personnel will immediately observe, report, and record the suspicious activity. • In case of emergency, the private security personnel and site/camp management will contact police control, police station and patrolling parties of law enforcement agencies in the respective area to tackle the issue.							

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

Table 80: Social Mitigation and Monitoring Plan

Item	Social Impacts	Related Activity	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
Impediments to Community Movement										
1	**Impediments to Community Movement**	Blockage of community routes Community disturbance due to an increase in traffic around settlements areas	The contractor's traffic management plan should include plans for the emergency transfer of members of the public to suitable medical facilities in the event of a serious accident resulting from the construction works. A complaints register shall be placed at the Contractor's, PIU, and Engineer's offices to address complaints. The blockage of local roads and routes shall be minimized. If unavoidable, consultation with the affected communities will be carried out and alternate routes (by-passes) shall be identified and advertised. Details of transport and medical treatment en-route are to be included in the contractor traffic management plan.	Contractor	Contractor Health and Safety Plan Contractor Camp Office Near Community Areas or settlements Contractor Health and Safety Plan	Monthly Basis Routine basis Routine Basis Routine Basis	The contractor traffic management plan shall be prepared and include alternative routes for their traffic movement. The key mitigation provides in this ESMP.	✓	✓	✓

Item	Social Impacts	Related Activity	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
2	**Labor Influx**	The hiring of skilled and unskilled labor	Priority shall be given to locals for skilled and unskilled jobs.	Contractor	All Work areas (channel and construction sites)	During the project execution phase	Skilled and unskilled labor are hired from the local community			
		Increased population in the area by the workforce from outside the local community.	Respect for human rights and no violation of rights of labor			Monthly basis	No labor rights are affected			
			All camp sitting shall be 500 m away from the local community to avoid disturbance to local cultural norms.		Settlements near the work areas	During siting of camp	Camps are the location from community trespass area and have adequate boundary			
			Adequate training to migrant labor shall be provided on the cultural norms of the local community.			Quarterly Basis	The contractor training plan is implemented accordingly.	✓	✓	
		GBV or sexual exploitations and abuse among women and children's	Educate and raise awareness among labor's (contractor's staff) on the civil, social, and legal rights of women, adolescents and children about risks of SEA, including case management support, health services, psychosocial support, police support and security, access to legal services, and shelter, if needed.		Entire sub-project area	Routine Basis	No GBV or sexual exploitations take place. The rights of women and children or any vulnerable groups are not affected.			

Item	Social Impacts	Related Activity	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
4	**Community Health and Safety**	Traffic movement around the sub-project areas The decline in air and water can cause health diseases asthma, skin irritation diarrhea, hepatitis B and C, and typhoid Safety hazards to the local community or trespassers due to bad housekeeping, movement of machinery, Inadequate disposal of sewerage waste	The contractor's Health and Safety Plan should include plans for the emergency transfer of members of the public to suitable medical facilities in the event of a serious accident The contractor shall not permit casual observer close to work sites Adequate safety measure is implemented around worksite (i.e. barricades, safety singes) The contractor shall prepare a pollution prevention and control plan, which shall include a method for the disposal of sanitary waste	Contractor	All Worksites Sanitary and solid waste Disposal locations	Monthly Basis During work activities During work activities During camp establishment	Contractor health and safety is implemented accordingly Health and safety officer is available to full time at sites No, any waste is directly disposed of near the water bodies, channel, or on open land	✓	✓	
	Construction Activities	Drowning risk especially for children during floods	Contractor to appoint Community Liaison Officer, install display boards. Provide side railing in design.	Contractor	Construction Site	In design and during the commencement of works	Community awareness to be conducted	✓		

Item	Social Impacts	Related Activity	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
5	**Community Disturbance**	Use of community routes for the transportation of machinery and manpower Use of generator, horns and other equipment which may cause noise pollution Congestion on community routes Use of community water resources resulting in the depletion of community water resources. Construction of contractor camps Construction carried out during night time	A Community Liaison Officer will be appointed full-time at the site to address community issues if any. The contractor shall locate its camps in which laborers shall reside overnight, at least 500m (16,25 ft) A complaints register shall be placed at the Contractor's, PIU, and Engineer's offices to address complaints. The register shall record measures taken in response to the complaint The contractors working hours shall be limited to between 6 am and 6 pm, six days a week to reduce disturbance. The pressure horns will not be allowed while passing through or near communities in the sub-project are	Contractor		Monthly basis During camp establishment Monthly Basis Routine basis Routine basis	The contractor community liaison officer is available full time at the site. No camp is located near any settlement The record of social complaint register is maintained and is kept at the contractor campsite Work timing is limited during day time and the community is consulted before carrying out work activities at night time No pressure horn is used by contractor staff at all times.	✓	✓	✓

Item	Social Impacts	Related Activity	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
6	**Impacts on Women, Children, elderly, disabled, and other Vulnerable Groups**	Impacts on women and other vulnerable groups are not considered during planning, implementation, and monitoring activities	In awareness-raising, women and vulnerable groups should be given priority. Ensure participation of women and vulnerable groups in project activities through consultations, to ensure planned investments take the well-being of such groups into consideration. Ensure the participation of women and vulnerable groups in social mobilization activities. Use female social organizers and social mobilizers to reach out to women and discuss impacts that have specific relevance for women.	PMU, PIU, PSIAC	All Channel sites	Monthly	Consultation records Awareness-raising records Social mobilization records	✓	✓	✓
7	**Participation of women and other groups**	The voice and needs of women and other vulnerable groups do not inform project development activities	Identify all direct and indirect stakeholders Hold meetings with all community groups. Use female social organizers and social mobilizers to encourage the participation of women in all stages of the project. Identify the communication mechanisms most commonly used by women and ensure these are used to impact and receive information throughout the project.	PMU, PIU, PSIAC	All Channel sites	Monthly	Consultation records Awareness-raising records Social mobilization records	✓	✓	✓

Item	Social Impacts	Related Activity	Mitigation Measures	Implementing Entity	Monitoring			Monitoring body		
					Monitoring Location	Monitoring Frequency/ Duration	Monitoring Parameter (for compliant action)	PSIAC	PMU	M&E C
8	**Voluntary Land Donation**	Approximately 39 acres of land are required for the construction of Sehan Channel and two distributary minors	In case there are any standing crop on the land being donated the land will not be taken for construction use till the crop has been harvested	PMU	Sehan Channel and distributary minor 1 & 2	During Construction work	Agriculture land is harvested		✓	✓

10 Grievance Redress Mechanism (GRM)

10.1 General

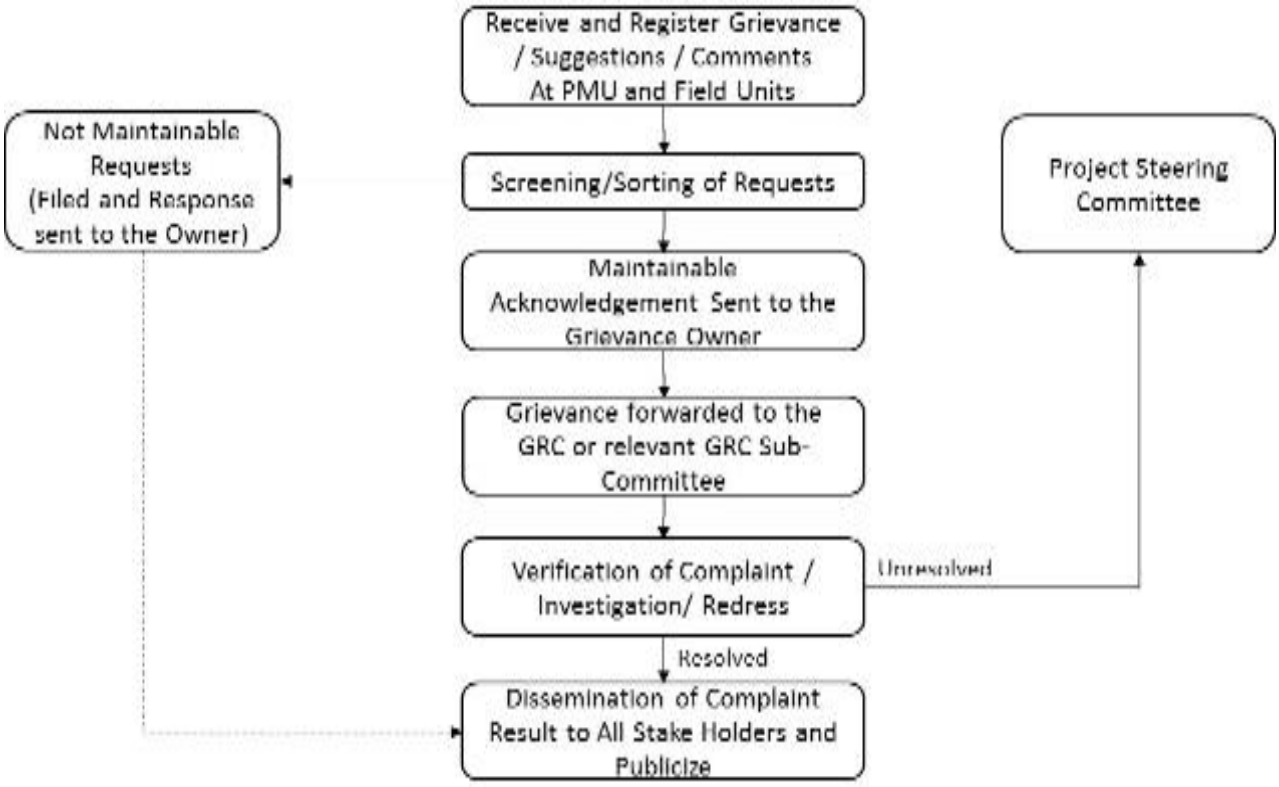
The BIWRMDP is committed to grievance redress. Effectively addressing grievances from people impacted by the projects is a core component of managing operational risk. The Grievance Redress Mechanism (GRMs) will be an effective tool for early identification, assessment, and resolution of complaints such as labor issues, GBV/SH within the project staffs and communities, and other environmental and social related issues along with anonymous grievances/complaints. The approach to Grievance Redress will be through three interlinked steps: (i) a risk-based assessment of potential grievances, disputes, or conflicts that may arise during project implementation; (ii) identification of the PMU's existing capacity for grievance redress; and (iii) an action plan that identifies mechanisms at the project level and where applicable.

The action plan will necessarily be BIWRMDP specific but would focus on tangible arrangements and steps. A key emphasis will be to support improved departmental capacity for addressing disputes that might arise from Project impacts. A firm channel and mechanism will be adopted which will include:

1 Access Point / Complaint Uptake - The uptake channels should be established and publicized by the PMU and where relevant, the contractors.
2 Grievance Recording – It will be made sure that all incidents and complaints/grievances are properly recorded and on time.
3 Assessment and Acknowledgment - Eligibility would be made to ensure that the issue being raised is relevant to the Project. A written response to the complainant, acknowledging receipt, and detailing the next steps will duly be done. Response to the aggrieved about the mechanism and time span or referring to the next or appropriate channel for redress will be made.
4 Resolution and Follow-up – All grievances would be resolved within a stipulated time span at the respective level. A follow-up of cases will be done to determine satisfaction with the process, resolution of the complaint, etc.
5 Record and Reporting - The PMU will provide tracking numbers to the grievances received to determine and monitor whether complaints have been redressed or not.

The Bank team would be provided the grievance data through scheduled progress reports on the status of grievance redress to support the PMU in early identification of developing any risks by the Task Team. The issues of grievances related to project development works etc. under BIWRMDP will be reported and addressed through the PMU and locally established set-ups. The FOs through their nominated Focal Persons (established under the project) will also play a role in the existing project GRM. All grievances will be recorded and within a stipulated time period, redressed.

Figure 13: Key Steps in Grievance Redress Mechanism



10.2 Objectives of the Grievance Redress Mechanism

A grievance redress mechanism (GRM), consistent with the requirements of the World Bank Operational Policies and Guidelines will be established to prevent and address community concerns, reduce risks, and assist the project to maximize environmental and social benefits. In addition to serving as a platform to resolve grievances, the GRM has been designed to help achieve the following objectives:

(a) Open channels for effective communication, including the identification of new social issues of concern arising from the project;

(b) Demonstrate concerns about community members and their environmental well-being; and

(c) Prevent and mitigate any adverse social and environmental impacts on communities caused by project implementation and operations.

The GRM will be accessible to diverse members of the community, including more vulnerable groups such as women and youth. Opportunities for confidentiality and privacy for complainants are to be honored where this is seen as important.

10.3 Principles, Procedures, and Timelines

Bearing in mind the range of possible grievances, the following three basic standards will underpin the proposed systems for handling these:

- All grievances submitted in writing to staff assigned under the proposed Public Complaints Centre (PCC) for the project will be formally recorded, and a written acknowledgment issued to the aggrieved;
- Grievances will be dealt with a referral basis; those that the Contractor or the Project Implementation Consultant (PISA) are unable to resolve will be referred to the Grievance Redress Committee, with a final provision for appeal to Project Director, if an issue cannot be resolved with the PMU of the project.
- Every effort will be made to address or resolve grievances within the below explained fixed time-lines, which will be an indicator against the performance of the handling system:
    - Acknowledgment of a written submission will be issued to the complainant within three working days. If not resolved earlier by the Contractor or Supervisory staff on-site;
    - Grievances will be tabled for discussion/resolution to the Project Director within one week of receipt of the written submission. The Project Director will forward it to the Grievance Redress Committee,
    - If not satisfactorily resolved by the Grievance Redress Committee; the grievance will be referred to consideration by the Secretary, Irrigation Department Government of Balochistan within 1 week.
- The cases that prove impossible to resolve through Grievance Redress Committee may be referred to as the Project Steering Committee (PSC) established under the Planning and Development Department (P&D), Government of Balochistan, comprising senior representatives from P&D, Irrigation Department. This Board will meet as needed to adjudicate on cases and either send their recommendations for endorsement to the Secretary, P&D or refer these for legal action. Where feasible, a response will be forthcoming to such appeals within one month of submission.
- If the complainant is not satisfied, the complaint will have the option to seek redress through a court of law.

10.4 Grievance Recording and Redress Monitoring

The Project Management Unit (PMU) will maintain the database to document all complaints received from the local communities. The information recorded in the database register will include the date of the complaint, particulars of the complainant, description of the grievance, actions to be taken, the person responsible to take the action, movement of the document (forwarded to whom / which Committee), follow up requirements and the target date for the implementation of the mitigation measure. The database will also record the actual measures taken to mitigate these concerns. All complaints received in writing or received verbally will be properly recorded and documented.

10.5 Dissemination

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

The PD 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. PD 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.

10.6 Proposed Mechanism for Grievance Redress under BIWRMDP

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

a. Grievance Focal Points (GFPs), which will be educated people from each community. The GFPs should be community members who are easily approached by the community. The GFPs will be provided training by the Social Section of the PSIAC and PMU;

b. A Public Complaints Centre (PCC) will be established in the project office and will be responsible to receive, log, and investigate complaints;

c. A Grievance Redress Committee (GRC) will be established in the PMU office, responsible to address grievances forwarded by the PCC.

10.7 Grievance Focal Points (GFPs)

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

10.7.1 The Nomination of Focal Person for GRM at Community Level

The BIWRMD project has constituted two GRM committees at PSIAC and PIU levels for Sehan (FIS). To further streamline the procedures, during community consultations at the villages of the Sehan scheme, the FO through mutual agreement of their members, have nominated the following Focal Persons for grievance redress at the FOs and WDGs level[37].

Table 81: Member of GRM Focal Women Member

S. No	Name of village	Name of WDG	Name of Focal Persons
1	Laghara Zizgai, Pakistan Bashai	Laghara Zizgai	Iranai Bibi
2	Laghara Zizgai, Pakistan Bashai	Laghara Zizgai	Bakht Malo Bibi
3	Laghara Zizgai, Pakistan Bashai	Laghara Zizgai	Sitara Bibi
4	Raj bandi	Raj bandi	Bibi Zaiara
5	Raj bandi	Raj bandi	Sanzalai Bibi
6	Raj bandi	Raj bandi	Zar Bibi
7	Badnazai	Badnazai	Jan Bakht Bibi
8	Badnazai	Badnazai	Gul Dasta

[37] Source: PSIAC

9	Badnazai	Badnazai	Patasa Bibi

Source: Socio-economic survey by PMU/PSIAC teams

Table 82: Member of GRM Male Focal persons

S. No.	Name of FO	Name of Focal Person	Address
1	Laghara Zizgai	Haji Sattar	Mekhtar City District Loralai
2	Laghara Zizgai	Safar Khan	Mekhtar City District Loralai
3	Laghara Zizgai	Haji Abdul Qadir	Mekhtar City District Loralai
4	Laghara Zizgai	Haji Sattar	Mekhtar City District Loralai
5	Laghara Zizgai	Safar Khan	Mekhtar City District Loralai
6	Laghara Zizgai	Haji Abdul Qadir	Mekhtar City District Loralai
7	Raj Bandi	Haji Aqil Khan	Mekhtar City District Loralai
8	Raj Bandi	Haji Kareem Shaikh	Mekhtar City District Loralai
9	Raj Bandi	Molvi Muhd Amin	Mekhtar City District Loralai
10	Raj Bandi	Haji Bashir Ahmed	Mekhtar City District Loralai
11	Raj Bandi	Aqil Khan	Mekhtar City District Loralai
12	Raj Bandi	Molvi Rozi u ddin	Mekhtar City District Loralai

Source: Socio-economic survey by PMU/PSIAC teams

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

10.8 Public Complaints Centre

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

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

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

10.8.1 Role and Responsibilities of PCC

The responsibilities of the PCC are:

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

b. The PCC will instruct contractors and PSIA to refer to any complaints that they have received directly to the PCC. Similarly, the PCC will coordinate with local government to "capture" complaints made directly to them;

c. The PCC, with the PSIA and the Contractor, will investigate the complaint to determine its validity and to assess whether the source of the problem is due to project activities, and identify appropriate corrective measures. If corrective measures are necessary, PCC, through the PSIA, will instruct the Contractor to take necessary action;

d. The PCC will inform the Complainant of investigation results and the action is taken;

e. If the complaint is transferred from local government agencies, the PCC will submit an interim report to local government agencies on the status of the complaint investigation and follow-up action within the time frame assigned by the above agencies;

f. The PCC will review the Contractors response on the identified mitigation measures and the updated situation;

g. The PCC will undertake additional monitoring, as necessary, to verify as well as review that any valid reason for complaint does not recur.

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

10.9 Grievance Redress Committee (GRC)

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

10.9.1 GRM Steps and Timeframe

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

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

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

Stage 3: If no solution can be identified by the PCC or if the complainant is not satisfied with the suggested solution under Stage 2, the PCC will organize, within two (2) weeks, a multi-stakeholder meeting through GRC under the auspices of the PD-PMU, where all relevant stakeholders (i.e., the complainant, PSIA, contractor/operator, relevant local government offices) will be invited. The meeting should result in a solution acceptable to all, and identify responsibilities and an action plan. The contractors during construction and the PSIA during operation should implement the agreed-upon redress solution and convey the outcome to the PCC within seven (7) working days;

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

10.10 The budget of GRM Implementation

The cost for the implementation of GRM activities of the Sehan Flood Irrigation Scheme (Package 1, 2 and 3) is estimated PKR 1,000,000 and is provided in Section 11. The cost given will be borne by the project proponent (Client).

11 ESMP Budget

All the environmental and social management activities will be undertaken by the Contractor under the direct supervision of PSIAC. The cost of ESMP activities will be included in the Contractor Budget in accordance with the procedures defined in the Condition of Contract (CoC) of the bidding document. The ESMP implementation budget will be applicable for each separate package (1, 2 &3). The cost details for the implementation of ESMP are provided below[38].

Table 83: ESMP Implementation Cost Estimates (Applicable for Each Package Separately)

S. No.	Description	Estimated Cost (PKR)	In US $ *(exchange rate 201 PKR)*
1.	Preparation and Implementation of Contractor Environmental and Social Management Plan (*Pollution Prevention Plan (Air/Noise/Waste/Sanitary waste management plans), Traffic Management Plan, EHS training Plan)*	250,000 Rupees/Month X 23 months=5,750,000 Rupees	28,607 $
2.	Preparation and Implementation of Contractor Health and Safety Plan *(Detailed HSP, emergency plan)*	250,000 Rupees/Month X 23= 5,750,000 Rupees	28,607$
3.	Appointment of ESMP Staffing: • Paramedic staff • Health and Safety Officer • Environmental Officer • Human Resource Officer • Community Liaison Officer • Safety Supervisor	540,000 Rupees/Month 23 months= 12,420,000 Rupees	61,791 $
4.	Baseline Ambient Air/Water/Noise Monitoring (water testing yearly, air quality yearly, vehicle and machinery testing 1st at time of mobilization then yearly.	1,000,000 Rupees (Lump sum for Project Duration)	4975 $
5.	Develop GRM Mechanism and training of GRM committees, contractor, and PSIA staff (All expenses to be incurred in GRM implementation)	1,000,000 Rupees *(Cost to be borne by PMU)*	4,975 $
6.	Training on Covid-19, environmental health and safety, GBV and SEA, for Contractor and PSIA staff including awareness sessions for the communities and develop printing materials to be disseminated[39].	PKR 200,000 lump-sum /event (250 number of persons, 13 trainings & 6 sessions). **Total=2,600,000** *(Cost to be borne by PMU)*	12,935 $

[38] The separate cost will be applicable for each package and contractor.
[39] Arranged and borne by PMU.

S. No.	Description	Estimated Cost (PKR)	In US $ *(exchange rate 201 PKR)*
7.	Dealing with Covid-19 Emergency[40]	1,500,000 *(Cost to be borne by PMU)*	7,462 $
8.	Contingency[41]	15,000,00 *(Cost to be borne by PMU)*	7462 $
9.	Total ESMP Budget	30,020,000 PKR	149,353[42] $

[40] Dealing with medical emergency and testing kits, provision of safety kits
[41] For unforeseen social and environmental impact or cost adjustment required for additional budget
[42] This amount is applicable for one package and shall be separate for other two packages.

12 Conclusions

The overall interventions of this scheme will have positive environmental and social impacts. Once the scheme is completed, it will increase the efficiency and effectiveness of floodwater distribution to the downstream side, and within the command area, thus providing benefits to the agricultural land at the tail end and also improving reliability and equal irrigation. While the construction of structures i.e. weir and fall structures will also cause water ponding on the upstream side, increasing irrigation capacity and providing a beneficial breeding environment for fauna habitat. In addition, the positive impacts are concluded:

- The water table in the vicinity will increase the availability of water for drinking, washing, and other uses.
- Increase in recharge of aquifers through percolation.
- Enhanced agricultural production will result in an uplift of local livelihood. It will also enhance livestock productivity due to the availability of fodder and water.
- An increase in skilled/unskilled job opportunities for area residents skilled/unskilled job opportunities for a villager will be increased.

The anticipated adverse environmental and social impacts are avoided or minimized by taking necessary mitigation measures and properly implementing environmental and social monitoring plan. The overall scheme implementation will have positive impacts.

13 References

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

1. Feasibility and Design Study Report Sehan FIS (Volume-1)), March 2014.
2. Social Impact Assessment and Management Plan, BIWRMDP Jan 2016.
3. Environmental Assessment (EA), BIWRMDP, Jan 2016.
4. Project Appraisal Document (PAD), Jun 2016.
5. Appraisal Stage Integrated Safeguard Data Sheet (ISDS), BIWRMDP, Feb 2016.
6. Bidding documents (Sehan Flood Irrigation Schemes).
7. Engineering Drawings (Sehan Flood Irrigation Schemes).
8. The Balochistan Wildlife Protection Preservation Conservation Management Act 2014.
9. The International Union for Conservation of Nature (Red List).

Appendices

Appendix A. Study Team 179
Appendix B. Environmental Code of Practices (ECOPs) 181
Appendix C. Format of a Monthly Monitoring Report 192
Appendix D. Cadastral Record and VLD Agreements 194
Appendix E. Monthly Monitoring Checklist 208
Appendix F. List of Participants: Public Consultation, Formation of FO and WDGs 213
Appendix G. Integrated Pest Management 227
Appendix H. Checklist of Procedures for Cultural Heritage finds 232
Appendix I. SOPs during Implementation of Civil Works 234
Appendix J. Certificate of Environmental (Water, Soil, Noise and Air) Quality Testing by QTS 237
Appendix K. Water Quality Results 238
Appendix L. TORs of Women Development Group 241

Appendix A. Study Team

Following team members were involved during the term of field visit and preparation of this ESMP.

Table A.1: Name of Team Members

S. No	Name of members	Responsibilities
1	Mr. Kaleemullah Khan Environmental Specialist PSIAC)	Originating ESMP. Review baseline surveys data Walkthrough survey to the sub-project area for environmental aspects Preparation of ESMP
2	Muhammad Arif Khan (Social Specialist)	Social data of the scheme Review the social component of ESMP Origination social component of the ESMP. Reviewing Socio-economic baseline, consultation, the formation of FO and WDGs, walkthrough surveys along with channels, involvements in a meeting of all line departments
3	Mr. Abdul Jabbar Kakar (Deputy Director of Environmental Protection Agency, Balochistan)	Baseline Samplings (Air/Water/Noise/Meteorological Parameters)
4	Mr. Naqeeb Ullah Kakar Community Mobilizer PSIA	Participated in project orientation meetings, review meetings, data collection and feeding the data in soft, initial orientation meetings with communities on project objectives and interventions, etc, keep records of each meeting and baseline surveys, etc. Supported the project teams in organizations of FOs formations meetings, report writing and keep a record in hard/soft.
5	Mr. Siraj Ahmed Community Mobilizer PSIA	
6	Mr. Bilal Ahmed Social Organizer PSIA	
7	Mr. Ehtesham ul Haq Social Organizer PSIA	
8	Mr. Baz Muhammad Community Mobilizer PSIA	
9	Ms. Sara (Gender Specialist)	Overall supervision, technical backstopping and demonstrations of Gender program in the field and desk work.
10	Ms. Rizwana (Female Community Mobilizer)	Formation of WDGs Women side Community Consultations Record keeping

Field Visit Photographs

Photo 1. Mekhtar Town (GRM Committees) formation

Photo 2: Location of construction of Guide Bund

Photo 3: Location of Sehan Channel to be constructed under Package-1

Photo 4: Filed visit of Sehan Scheme by PSIA engineering, socio-environment team

Photo 5:Formatin of FO at Mekhtar Town (Khilli Raj-Bandi)

Photo 6: Formation FO at Mekhtar Town (Killi Zizqai Laghara)

Appendix B. 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 scheme areas. The contractor shall be required to follow World Bank Group, IFC EHS guidelines[43] and Environmental Code of Practices (ECoPs) which provide the methods by which the Contractor should comply with the mitigations contained in this ESMP. The objectives of these World Bank Group (IFC-EHS Guidelines) and ECoPs are to provide best guideline practices on environmental, health, and safety during the operation phase of the scheme.The following best practices are:

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

Table 1: ECoP for Water Resource Management

Activity	Environmental Impact	Environmental Management Guideline
Drinking water	Groundwater at shallow depths might be contaminated and hence not suitable for drinking purposes.	Tube wells will be installed with due regard to the surface environment, protection of groundwater from surface contaminants, and protection of aquifer cross-contamination. Control the quality of the groundwater to be used for drinking water on the basis of NEQS standards for drinking water. Safe and sustainable discharges are to be ascertained prior to the selection of pumps. All tube wells, test holes, monitoring wells that are no longer in use or needed shall be properly decommissioned
Construction activities in water bodies	Construction works in the water bodies will increase sediment and contaminant loading, and affect the habitat of fish and other aquatic biology.	Monitor the water quality in the runoff from the site, and improve work practices as necessary Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways, stormwater systems or underground water tables. Use environment-friendly and nontoxic slurry during the construction of piles to discharge into the river.

[43] https://www.ifc.org/wps/wcm/connect/29f5137d-6e17-4660-b1f9-02bf561935e5/Final%2B %2BGeneral%2BEHS %2B Guidelines.pdf?MOD=AJPERES&CVID=nPtguVM

Activity	Environmental Impact	Environmental Management Guideline
		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 & disposal of hazardous material and waste	Water pollution from the storage, handling, and disposal of hazardous materials and general construction waste, and accidental spillage	Follow the management guidelines proposed in ECoPs for Waste Management and Management of Fuels & Hazardous Substances. Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter a watercourse or underground water tables

Table 2: 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

Activity	Environmental Impact	Environmental Management Guideline
		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

Table 3: ECoP for Waste Management

Activity	Environmental Impact	Environmental Management Guideline
Generation of hazardous wastes	Safety, health and environmental hazards due to improper waste Management practices	Collect chemical wastes in 200-liter drums (or similar sealed containers), appropriately labeled for safe transport to an approved chemical waste depot. Store, transport and handle all chemicals, avoiding potential environmental pollution. Collect hydrocarbon wastes, including lubricating oils, for safe transport off-site for reuse, recycling, treatment or disposal at approved locations. Construct concrete or other impermeable flooring to prevent seepage in case of spills. Store all hazardous wastes appropriately in Bunded areas away from watercourses. Make available Material Safety Data Sheets (MSDS) for hazardous materials on-site during construction.
General waste	Soil, surface water & groundwater pollution from the improper disposal of wastes.	Request suppliers to minimize packaging where practicable. Place a high emphasis on good housekeeping practice. Collect and transport non-hazardous wastes to all the approved disposal sites. Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process. Develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food waste, etc.) prior to commencing of construction and submit to PSIA 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.

Table 4: 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,	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.

Activity	Environmental Impact	Environmental Management Guideline
	lubricants, chemicals and hazardous goods/materials on-site, and potential spills from these goods may harm the environment or health of construction workers.	Store dangerous goods in bunded areas on a top of a sealed plastic sheet or other impervious material away from watercourses. Refueling 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. 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.

Table 5: 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

Table 6: 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

Activity	Environmental Impact	Environmental Management Guideline
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

Table 7: ECoP for Noise & Vibration

Activity	Environmental Impact	Environmental Management Guideline
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

Table 8: ECoP for Flora

Activity	Environmental Impact	Environmental Management Guideline
Vegetation clearance	Local flora is important to provide shelters for the fauna, offer fruits and/or timber/firewood and protect soil erosion. Such as damage to flora has a wide range of adverse environmental impacts.	Clear only the vegetation that needs to be cleared in accordance with the designs. These measures are applicable to both the construction areas as well as for any associated activities such as sites for stockpiles, disposal of fill and construction of diversion roads, etc. Do not burn cleared vegetation – where feasible, chip or mulch and reuse it for the rehabilitation of affected areas, temporary access tracks or landscaping. Mulch provides a seed source, can limit embankment erosion, retains soil moisture and nutrients, and encourages re-growth and protection from weeds. Reduce disturbance to surrounding vegetation Use appropriate type and minimum size of the machine to avoid disturbance to adjacent vegetation. Get approval from the supervision consultant for the clearance of vegetation. Make selective and careful pruning of trees where possible to reduce the need for tree removal.

Activity	Environmental Impact	Environmental Management Guideline
		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. Minimize the length of time the ground is exposed or excavation left open by clearing and re-vegetating the area at the earliest practical possible. Ensure excavation works occur progressively and re-vegetation is implemented at the earliest practicable stage

Table 09: ECoP for Fauna

Activity	Environmental Impact	Environmental Management Guideline
Construction activities	The location of construction activities can result in the loss of wildlife habitat and habitat quality Impact on migratory birds, habitat and active nests	Limit the construction works within the CoI. The Contractor is not permitted to destruct active nests or eggs of migratory birds Minimize the release of oil, oil wastes or any other substances harmful to migratory birds to any waters or areas frequented by migratory birds.
Construction camps	Illegal poaching	Provide adequate knowledge to the workers regarding the protection of flora and fauna, and relevant government regulations and punishments for illegal poaching.
Vegetation clearance	Clearance of vegetation may impact shelter, feeding and/or breeding and/or physical destruction and severing of habitat areas	Restrict the tree removal to the minimum required. Retain tree hollows on-site, where appropriate Leave dead trees where possible as habitat for fauna Fell the hollow-bearing trees in a manner that reduces the potential for fauna mortality. After felling, hollow trees will remain unmoved overnight to allow animals to move of their own accord.
Breeding Season & Nesting	During earth works and vegetation clearance	The contractor environment officer shall survey the construction sites to eliminate the potential risk of any incident to any terrestrial, reptilian, mammals, fauna species prior to the construction works. On identification of any such nest (on ground or trees), the contractor shall immediately cease works in the area and inform the Engineer and PMU. The contractor shall erect a fence within 50ft of the nest and prohibit any works within this area until approved by the Engineer who shall arrange for an ecologist from PSIA 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

Activity	Environmental Impact	Environmental Management Guideline
		• Imperial Eagle (*Aquila heliaca)*- November to April • Common Crane *(Grus grus)*- May • Houbara Bustard (*Chlamydotis undulata*)-March & October **Reptiles** • Bengal Monitor (*Varanus bengalensis*)-June to September • Oxus Cobra *(Naja sp)*-April • Tortoise Afghan *(Testudo horsfieldii*)-May or June **Mammals** • Common Hill fox *(Vulpes vulpes*)- December or February • Wolf *(Canis lupus)*-January and April • Urial (*Ovis vignei)*-April to May • Marbled Polecat (*Vormela peregusna)*-April to June

Table 10: ECoP for Health & Safety

Activity	Environmental Impact	Environmental Management Guideline
Training	Lack of awareness and basic knowledge in health care among the construction workforce, making them susceptible to potential diseases.	Train all construction workers in basic sanitation and health care issues (e.g. How to avoid malaria and transmission of sexually transmitted infections (STI) HIV/AIDS). Train all construction workers in general health and safety matters, and on the specific hazards of their work Training should consist of basic hazard awareness, site-specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. Commence malaria, HIV/AIDS and STI education campaign and compliment it with a strong condom marketing and increased access to condoms in the area Implement malaria, HIV/AIDS and STI education campaign targeting all workers hired, international and national, female and male, skilled, semi- and unskilled occupations, at the time of recruitment and thereafter pursued throughout the construction phase on a regular basis.
Accidents	Health and safety of the workforce, exasperated if adequate health care is not available	Ensure health care facilities and first aid facilities are readily available. Appropriately equipped first-aid stations should be easily accessible throughout the project area Document and report occupational accidents, diseases, and incidents. Prevent accidents, injury, and disease arising from, associated with, or occurring in the course of work by minimizing, so far as reasonably practicable, the causes of hazards. In a manner consistent with good international industry practice. Identify potential hazards to workers, particularly those that may be life-threatening and provide necessary preventive and protective measures. Provide awareness to the construction drivers to strictly follow the driving rules Provide adequate lighting in the construction area
Construction Camps	Lack of proper infrastructure facilities, such as housing, water supply, and sanitation facilities will increase pressure on the local services and generate substandard	The Contractor shall provide the following facilities in the campsites to improve health and hygienic conditions as mentioned in Table 14 (Construction Camp Management): Adequate ventilation facilities Safe and reliable water supply. Water supply from deep tube wells that meets the national standards Hygienic sanitary facilities and sewerage system Treatment facilities for sewerage of toilet and domestic wastes Stormwater drainage facilities. Recreational and social facilities

Activity	Environmental Impact	Environmental Management Guideline
	living standards and health hazards.	Safe storage facilities for petroleum and other chemicals in accordance with Table 2 Solid waste collection and disposal system in accordance with Table 1. Arrangement for training Security fence at least two meters in height. -Sickbay and first aid facilities
Water and sanitation facilities at the construction sites	Lack of water, sanitation facilities at construction sites cause inconvenience to the construction workers and affect their personal hygiene.	The contractor shall provide latrines on the construction sites. The location of facilities should be at least six meters away from any storm drain system and surface waters. These latrines should be cleaned once a day. The contractor should provide drinking water facilities to the construction workers at all the construction sites.
General construction works	Construction works may pose health and safety risks to the construction workers and site visitors leading to severe injuries and deaths. The population in the proximity of the construction site and the construction workers will be exposed to a number of (i) biophysical health risk factors, (e.g. noise, dust, chemicals, construction material, solid waste, wastewater, vector transmitted diseases, etc), (ii) risk factors resulting from human behavior (e.g. STD, HIV, etc) and (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 protective clothing to workers involved in hazardous operations and proper performance of their job Appoint an environment, health, and safety manager to look after the health and safety of the workers Inform the local authorities responsible for health, religious and security before the commencement of civil works and establishment of construction camps so as to maintain effective surveillance over public health, social and security matters The Contractor shall follow the ECoPs presented in the following tables to reduce health risks to the construction workers and nearby community

Table 11: 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 PSIA 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

Activity	Environmental Impact	Environmental Management Guideline
		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:

Table 12: ECoP for Camp Management

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

Activity	Environmental Impact	Environmental Management Guideline
		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.
Siting and Location of construction camps	Campsites for construction workers are important locations that have significant impacts such as health and safety hazards on local resources and infrastructure of nearby communities.	Locate the construction camps in areas that are acceptable considering a balance of environmental, cultural and social aspects. Consider the location of construction camps away from communities in order to avoid social conflict in using natural resources such as water or to avoid the possible adverse impacts of the construction camps on the surrounding communities. Submit to PSIA for approval a detailed layout plan for the development of construction camps showing the relative locations of all temporary buildings and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use in power supply generators), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps. The local authorities responsible for health, religious and security matters shall be duly informed on the set up of camp facilities so as to maintain effective surveillance of public health, social impacts, and security.
Fuel supplies for cooking purposes	Illegal sourcing of fuelwood by construction workers will impact the natural flora and fauna	Provide fuel to the construction camps for their domestic purpose, in order to discourage them to use fuelwood or other biomass. Make available alternative fuels like natural gas or kerosene to the workforce to prevent them from using biomass for cooking. Conduct awareness campaigns to educate workers in preserving the biodiversity of the project area, and relevant government regulations and punishments associated with improper wildlife protection.
Health and Hygiene	There will be a potential for diseases to be transmitted, including malaria, exacerbated by inadequate health and safety practices. There will be an increased risk of work crews spreading sexually transmitted infections and HIV/AIDS.	Provide adequate health care facilities within construction sites. Provide first aid facility round the clock. Maintain stock of medicines in the facility and appoint a doctor on site. Provide transport facility for the laborers during an emergency to be transported to the nearest hospitals. 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 HIV awareness programming, including STI (sexually transmitted infections) and HIV information, education and communication for all workers on a regular basis Provide adequate drainage facilities throughout the camps to ensure that disease vector habitats (stagnant water bodies, puddles) do not form. Place display boards at strategic locations within the camps containing messages on best hygienic practices
Site Restoration	Restoration of the construction camps to an original condition requiring demolition of construction camps and disposal of the material	Dismantle and remove from the site all facilities established within the construction camp, including the perimeter fence and lockable gates at the completion of the construction work. If possible, dismantle camps in phases as the work decreases (do not wait for the completion of the entire work) Give prior notice to the laborer 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.

Activity	Environmental Impact	Environmental Management Guideline
		To restore the site to its original condition or to an agreed condition with the landowner defined prior to the commencement of the works (in writing).

Appendix C. Format of a Monthly Monitoring Report

Scope of Works

Provide a summary regarding the engineering activities

Summary of Non-Compliances

This section summarises the findings of the Environmental Management Plan (ESMP) compliance monitoring completed by the PSIA under this project.

Summary of Action Required

Table XXX: Summary of Non-Compliances

S. No	Non-Compliances	Actions Required	Pending 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

5 Staffing and Documentation

This chapter provides the details about the key staff required and documentation required by the contractor

List of Key Staff, as per ESMP.

S. No	List of Staff	Remarks
1	Safety Supervisor	
2	Paramedic staff	
3	Health and Safety Officer	
4	Environmental Officer	
5	Human Resource Officer	
6	Community Liaison Officer	

List of Documents Required in ESMP

S. No	List of Documents	Remarks	Dated Approved
1	Traffic Management Plan		
2	Waste Management and Disposal Plan		
3	Pollution Prevention and Control Plan		
4	Training Plan		
5	Monitoring Plan		
6	Layout Plan of Main Camp		
7	Layout Plan of Sub-Camp		
8	Organization Frame Work		
9	Hazardous Waste Plan		
10	Health and Safety Plan		

Include Filled Monthly Monitoring Checklist for the month.

Appendix D. Cadastral Record and VLD Agreements

D.1 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, 39 acres of land has been acquired from the farmers for construction of Sehan channel and two distributary minors. Total 24 farmers have donated their 39 acres of lands for the sub-project of BIWRMDP. Out of 39 provided lands, 30 acres will be used for the construction of main channel while 09 acres obtained land will be used for the construction of distributary minor 1 and 2 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 scanned formats and agreements are provided below:

D.2: Cadastral Record

Appendix H.2 URDU VLD Screening Form

سکیننگ فارمیٹ وی ایل ڈی

نام چینل لغشہ ڈزگی / راج بنڑی تاریخ 11 نومبر 2020

سیریل نمبر	زمیندار کا نام اور والد کا نام	گاؤں	قبیلہ	خاندان	درکار زمین (میٹر کے حساب سے)	درکار زمین کی لمبائی (فٹ کے حساب سے)	درکار زمین کی چوڑائی (فٹ کے حساب سے)
1	مولوی عثمان ولد عبدالحلیم	راج بنڑی	کاکڑ	بدنازئی	03%	842	513
2	حاجی خیرالدین ولد حاجی حسن	راج بنڑی	کاکڑ	باکنیزئی	04%	559	437.
3	حاجی عقل خان ولد ورکر حاجی علی اکبر خان	راج بنڑی	کاکڑ	باکنیزئی	03%	384	566.
4	حاجی طور ولد حاجی عبدالکریم	راج بنڑی	کاکڑ	کنیزائی	07%	396	250.
5	آزاد خان ولد لیو	راج بنڑی	کاکڑ	باکنیزئی	6%	352	280.
6	حیات خان ولد داش	راج بنڑی	کاکڑ	بدنازئی	05%	489	297.
7	نجم الدین ولد عبدالرحمان	راج بنڑی	کاکڑ	باکنیزئی	06%	290	265.
8	نگے ولد بہادر	راج بنڑی	کاکڑ	باکنیزئی	03%	352	446
9	نواللہ ولد پناس	لغشہ	کاکڑ	آکندزئی	04%	203	360

GS- FO-1 Molui Safar Kha.

(BUOAMDPJ)

تیار کردہ:

13/11/20

نام: عبدالغفور کاکڑ

عہدہ: کمیونٹی ڈیولپمنٹ اسپیشلسٹ PSIAC.

CO. لغشہ ڈزگی راج بنڑی کمیٹی

CDS

12/11/2020.

13-11-20.

TEHSILDAR MEKHTAR
Assistant Collector. (Revenue)

Appendix H.2 URDU VLD Screening Form

سکیننگ فارمیٹ وی ایل ڈی

نام چینل: لغڑہ زرکی / راج بندی   تاریخ: 11 نومبر 2020

سیرئل نمبر	زمیندار کا نام اور والد کا نام	گاؤں	قبیلہ	خاندان	درکار زمین (میٹر کے حساب سے)	درکار زمین کی لمبائی (فٹ کے حساب سے)	درکار زمین کی چوڑائی (فٹ کے حساب سے)
1	مولوی صفر خان ولد گل [illegible]	لغڑہ	[illegible]	[illegible]	07%	439	280
2	عقل خان ولد [illegible]	راج بندی	[illegible]	[illegible]	07%	660.	230
3	مولوی عبدالستار ولد لعل محمد	لغڑہ	[illegible]	[illegible]	05%	584	300
4	[illegible]	بالاکی	[illegible]	[illegible]	04%	279	300
5	حاجی سعید ولد [illegible]	لغڑہ	[illegible]	[illegible]	05%	450	269
6	عصمت اللہ ولد حاجی [illegible]	لغڑہ	[illegible]	[illegible]	05%	151	270
7	حاجی [illegible] ولد شیخ محمد	زرکی	[illegible]	[illegible]	05%.	351	268
8							
9							

GS- Molwi Safar Khan
FO-1

تیار کردہ: [signature] 13/11/20

CDS - BaLO RMD P.

نام: [illegible]

عہدہ: [illegible]

CO.

[signature] 13/11/2020

[signature] 13-11-20

TEHSILDAR MEKHTAR
Assistant Collector. (Revenue)

[signature]

Appendix H.2 URDU VLD Screening Form

سکیننگ فارمیٹ وی ایل ڈی

نام چینل: لفڑہ زرگئی / راج بند (Canal) تاریخ: 11 نومبر 2020

سیریل نمبر	زمیندار کا نام اور والد کا نام	گاؤں	قبیلہ	خاندان	درکار زمین (میٹر کے حساب سے)	درکار زمین کی لمبائی (فٹ کے حساب سے)	درکار زمین کی چوڑائی (فٹ کے حساب سے)
1	عبداللہ جان ولد [illegible]	بانسر	کاکڑ	[illegible]	06%	660	321
2	عبدالقادر ولد ماشن	بالنی	کاکڑ	کنٹرزئی	07%	396	300
3	[illegible] ولد [illegible] خان	بالنی	کاکڑ	کنٹرزئی	06%	322	300
4	صالح جان ولد حاجی [illegible]	لفڑی	کاکڑ	[illegible]	06%	450	268
5	مولوی [illegible] ولد [illegible]	بلندی	کاکڑ	کنٹرزئی	06%	584	300
6	عبدالاحد ولد [illegible] جان	لفڑہ	کاکڑ	کنٹرزئی	06%	361	234
7	مولوی ابراہیم ولد ملا صدیق	لفڑہ	کاکڑ	کنٹرزئی	07%	344	269
8	محمد [illegible] ولد حاجی [illegible]	سلزرہ	کاکڑ	[illegible]	06%	200	230
9	[illegible]						

GS- FO-1 Molvi Safar Khan.

تیار کردہ: [signature] 13/11/20

نام: عبدالشکور

عہدہ: کمیونٹی ڈیولپمنٹ اسسٹنٹ

HDS.

BUORMDP

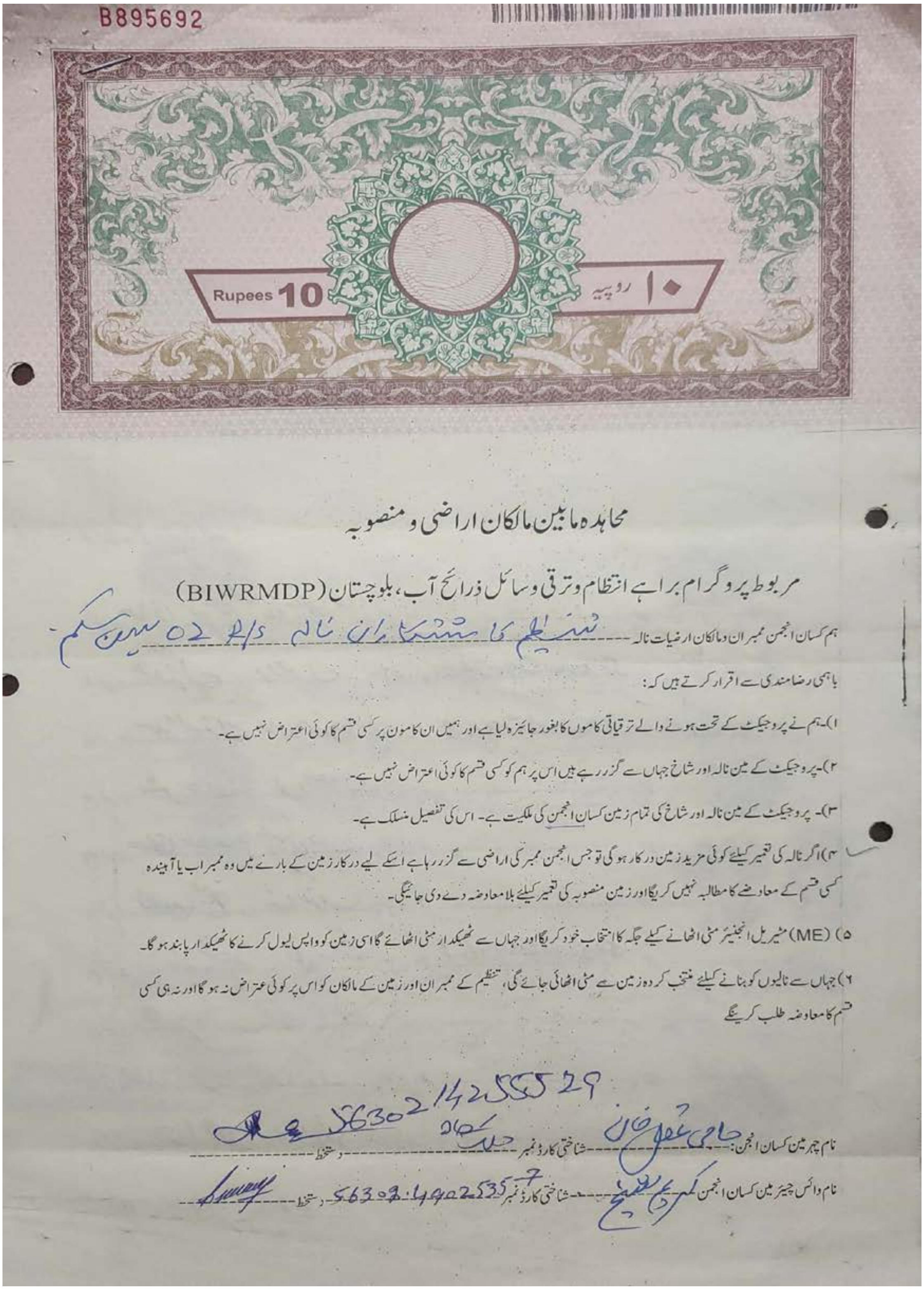
[illegible] CO.

[signature] 13/11/2020

[signature] 13-11-20

TEHSILDAR MEKHTAR
Assistant Collector. (Revenue)

D.3: VLD Agreements



B895692

Rupees 10

۱۰ روپیہ

محاہدہ مابین مالکان اراضی و منصوبہ

مربوط پروگرام براہے انتظام وترقی وسائل ذرائع آب، بلوچستان (BIWRMDP)

ہم کسان انجمن ممبران ومالکان 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 کامون 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۔

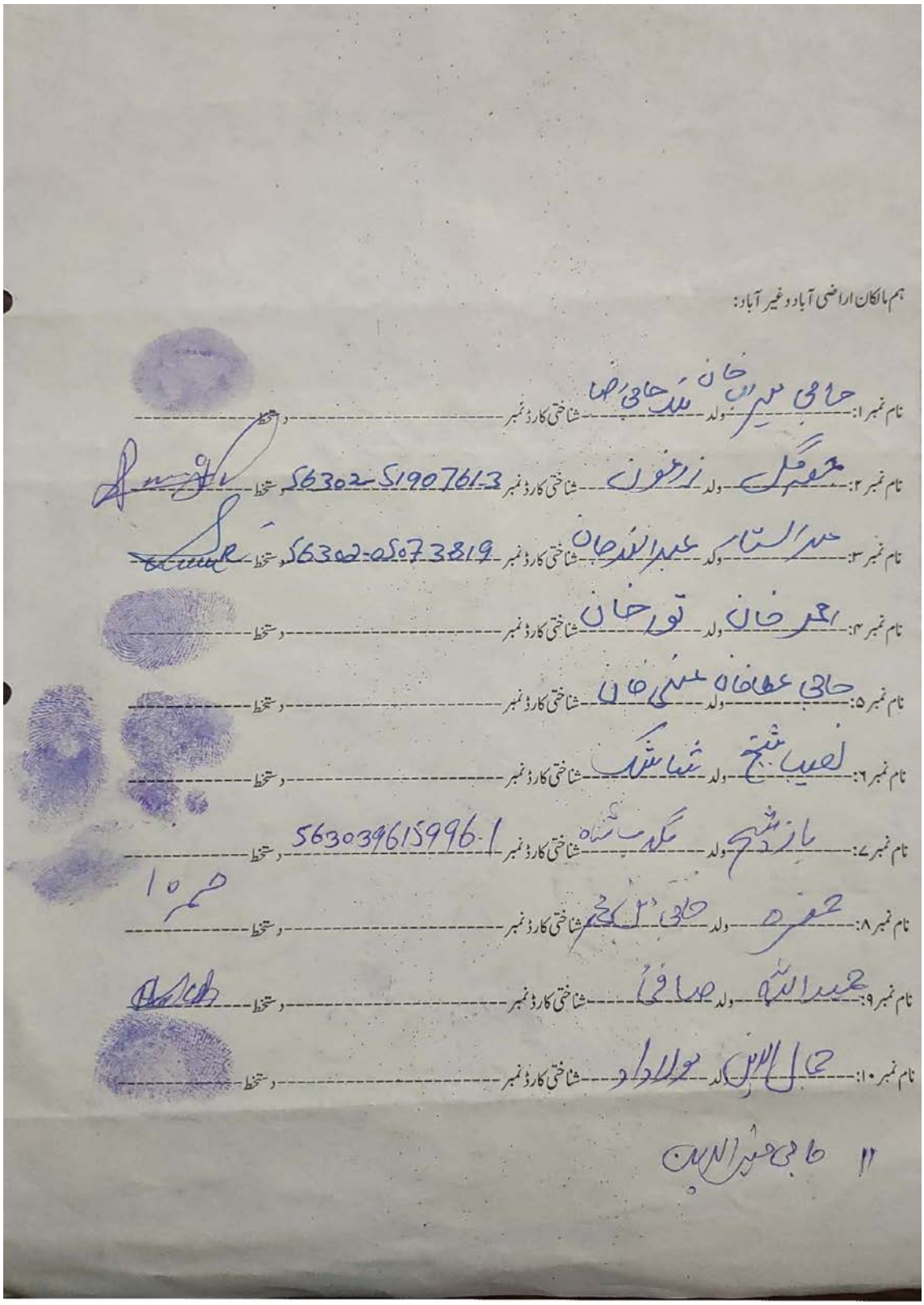
۴)اگر نالہ کی تعمیر کیلئے کوئی مزید زمین درکار ہوگی تو جس انجمن ممبر کی اراضی سے گزر رہا ہے اسکے لیے درکار زمین کے بارے میں وہ ممبر اب یا آیندہ کسی قسم کے معاوضے کا مطالبہ نہیں کریگا اور زمین منصوبہ کی تعمیر کیلئے بلا معاوضہ دے دی جائیگی۔

۵) (ME) میٹریل انجنیئر مٹی اٹھانے کیلیے 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 عتراض نہ ہوگا اور نہ ہی کسی قسم کا معاوضہ طلب کرینگے

نام چیرمین کسان انجمن: ____________ شناختی کارڈ نمبر 5630214255529 دستخط ____________

نام وائس چیرمین کسان انجمن ____________ شناختی کارڈ نمبر 5630?4402535? دستخط ____________



ہم مالکان اراضی آباد و غیر آباد:

نام نمبر ۱: حاجی میر رحمان ولد ملا حاجی رضا شناختی کارڈ نمبر ---------- دستخط ----------

نام نمبر ۲: شیر گل ولد زرغون شناختی کارڈ نمبر 56302-5190761-3 دستخط ----------

نام نمبر ۳: عبدالستار ولد عبدالرحمان شناختی کارڈ نمبر 56302-0507381-9 دستخط ----------

نام نمبر ۴: اکبر خان ولد نور خان شناختی کارڈ نمبر ---------- دستخط ----------

نام نمبر ۵: حاجی عطاء اللہ ولد ---- شناختی کارڈ نمبر ---------- دستخط ----------

نام نمبر ۶: نصیب شیخ ولد شاہ شیخ شناختی کارڈ نمبر ---------- دستخط ----------

نام نمبر ۷: بازشیخ ولد بگدپ شاہ شناختی کارڈ نمبر 56303961599-6-1 دستخط ----------

نام نمبر ۸: حمزہ ولد حاجی [illegible] شناختی کارڈ نمبر ---------- دستخط ----------

نام نمبر ۹: عبداللہ ولد صافی شناختی کارڈ نمبر ---------- دستخط ----------

نام نمبر ۱۰: جمال الدین ولد مولاداد شناختی کارڈ نمبر ---------- دستخط ----------

۱۱ حاجی صفی الدین

Rupees 10 — ۱۰ روپیہ

نام نمبر ۱۱: حاجی نور ولد حاجی عبدالکریم شناختی کارڈ نمبر 56302-0822162-3 دستخط

نام نمبر ۱۲: محمد امین ذاکر ولد عبدالمجید شناختی کارڈ نمبر 56302-0839018-3 دستخط

نام نمبر ۱۳: عقیل خان ولد محمد صالح خان شناختی کارڈ نمبر 5630216255529 دستخط

نام نمبر ۱۴: محمد رحیم ولد فیروز شاہ شناختی کارڈ نمبر 56302-4902535-7 دستخط

نام نمبر ۱۵: سلیم شاہ ولد بیان شاہ شناختی کارڈ نمبر 56302-4647604-7 دستخط

نام و دستخط نمائندہ گان پراجیکٹ:

۱۔ نام شفیع کاکڑ عہدہ کمیونٹی ڈویلپمنٹ سپیشلسٹ دستخط

۲۔ نام نقیب اللہ کاکڑ عہدہ کمیونٹی آرگنائزر دستخط

۳۔ نام عہدہ دستخط

۴۔ نام عہدہ دستخط

۵۔ نام عہدہ دستخط

12/11/2020

TEHSILDAR MEKHTAR
Assistant Collector (Revenue)

B895675

Rupees 10 — ۱۰ روپیہ

محاہدہ مابین مالکان اراضی و منصوبہ

مربوط پروگرام براہے انتظام وترقی وسائل ذرائع آب، بلوچستان (BIWRMDP)

ہم کسان انجمن ممبران ومالکان ارضیات نالہ ---------------- 01 [illegible]

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) مٹیریل انجنیئر مٹی اٹھانے کیلیے جگہ کا انتخاب خود کریگا اور جہاں سے ٹھیکدار مٹی اٹھائے گا اسی زمین کو واپس لیول کرنے کا ٹھیکدار پابند ہو گا۔

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 عتراض نہ ہو گا اور نہ ہی کسی قسم کا معاوضہ طلب کرینگے

نام چیرمین کسان انجمن:----------- شناختی کارڈ نمبر 5630245926367 دستخط ----------

نام وائس چیئرمین کسان انجمن ----------- شناختی کارڈ نمبر 5630268630189 دستخط ----------

ہم مالکان اراضی آباد و غیر آباد:

نام نمبر ۱: دیارب --- ولد --- شیخ --- شناختی کارڈ نمبر 56302-0840067-7 دستخط --- دیارب

نام نمبر ۲: گل محمد --- ولد --- فضل الدین --- شناختی کارڈ نمبر 56303-3409860-5 دستخط ---

نام نمبر ۳: بوزک --- ولد --- گل --- شناختی کارڈ نمبر 56302-0835072-3 دستخط ---

نام نمبر ۴: دوستک --- ولد --- حاجی گل --- شناختی کارڈ نمبر 56302-0818878-9 دستخط --- دوستک

نام نمبر ۵: علی خان --- ولد --- جمال خان --- شناختی کارڈ نمبر 56302-0835185-5 دستخط --- Ali

نام نمبر ۶: بایو --- ولد --- رسول داد خان --- شناختی کارڈ نمبر 56302-0840087-9 دستخط ---

نام نمبر ۷: سعر خان --- ولد --- گل بادان --- شناختی کارڈ نمبر 56302-8478541-9 دستخط ---

نام نمبر ۸: محمدان --- ولد --- ریحان خان --- شناختی کارڈ نمبر 56302-0624977-5 دستخط ---

نام نمبر ۹: عبداللہ خان --- ولد --- جمال خان --- شناختی کارڈ نمبر 56302-0840146-7 دستخط --- عبداللہ خان

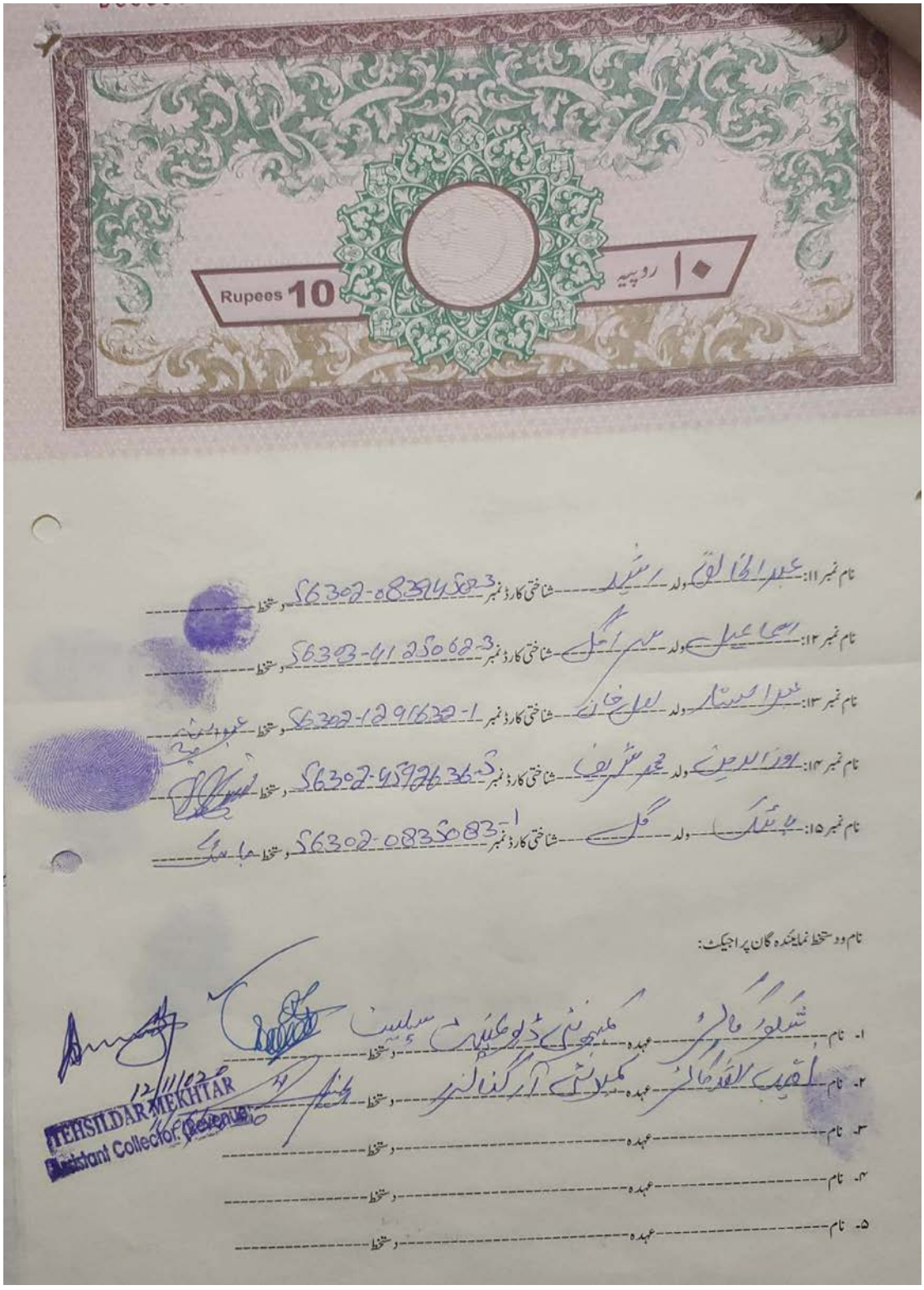
نام نمبر ۱۰: عالم خان --- ولد --- فاضل خان --- شناختی کارڈ نمبر 56302-6159149-7 دستخط ---

نام عبدالقادر ولد ماشی شناختی کارڈ 56302-6863013-9 دستخط عبدالقادر

TEHSILDAR [illegible] Collector Revenue

CDS Shakoor Kakar

22/11/2020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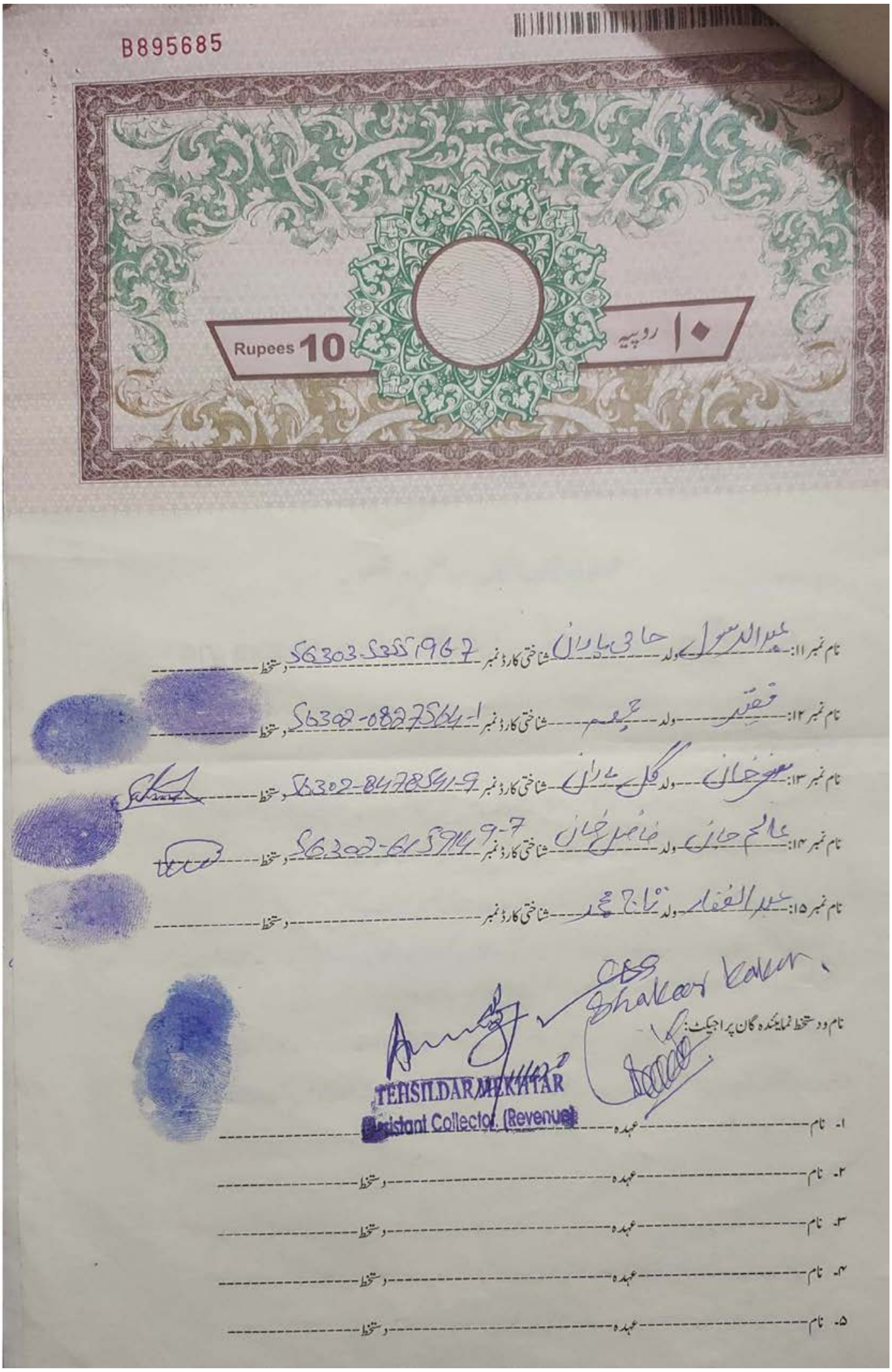
۱۰ روپیہ
نام نمبر ۱۱: عبدالخالق ولد رشید شناختی کارڈ نمبر 61302-0835483-3 دستخط
نام نمبر ۱۲: اسماعیل ولد میر اگل شناختی کارڈ نمبر 61303-4125062-3 دستخط
نام نمبر ۱۳: عبدالستار ولد لعل خان شناختی کارڈ نمبر 61302-1291632-1 دستخط
نام نمبر ۱۴: ولی الدین ولد محمد شریف شناختی کارڈ نمبر 61302-4592636-5 دستخط
نام نمبر ۱۵: پائندگ ولد گل شناختی کارڈ نمبر 61302-0835083-1 دستخط
نام و دستخط نمائندہ گان پراجیکٹ:
۱- نام شاہد خان عہدہ کمیونٹی ڈویلپمنٹ سپیشلسٹ دستخط
۲- نام اشفیق الرحمٰن عہدہ کمیونٹی آرگنائزر دستخط
۳- نام عہدہ دستخط
۴- نام عہدہ دستخط
۵- نام عہدہ دستخط
12/11/2020
TEHSILDAR MEKHTAR
Assistant Collector (Revenue)



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Rupees 10 — ۱۰ روپیہ

نام نمبر ۱۱: عبدالرسول ولد حاجی یاران شناختی کارڈ نمبر 56303-5355196-7 دستخط

نام نمبر ۱۲: مقتدر ولد محمد شناختی کارڈ نمبر 56302-0827564-1 دستخط

نام نمبر ۱۳: معز خان ولد گل یاران شناختی کارڈ نمبر 56302-8478561-9 دستخط

نام نمبر ۱۴: عالم جان ولد ناصر خان شناختی کارڈ نمبر 56302-615914-9-7 دستخط

نام نمبر ۱۵: عبدالغفار ولد تاج محمد شناختی کارڈ نمبر دستخط

نام و دستخط نمائندہ گان پراجیکٹ:

CSS Shakoor Kakar.

TEHSILDAR MEKHTAR
Assistant Collector (Revenue)

۱۔ نام ---- عہدہ ---- دستخط ----

۲۔ نام ---- عہدہ ---- دستخط ----

۳۔ نام ---- عہدہ ---- دستخط ----

۴۔ نام ---- عہدہ ---- دستخط ----

۵۔ نام ---- عہدہ ---- دستخط ----

ہم مالکان اراضی آباد و غیر آباد:

نام نمبر ۱: عبدالکریم ولد رضا شناختی کارڈ نمبر 56302-0848966-9 دستخط محب اللہ

نام نمبر ۲: عبدالجلیل ولد فتح محمد شناختی کارڈ نمبر 56302-0835057-3 دستخط

نام نمبر ۳: عبدالوہاب ولد فتح محمد شناختی کارڈ نمبر 56302-0835056-3 دستخط

نام نمبر ۴: ---------- ولد ---------- شناختی کارڈ نمبر ---------- دستخط ----------

نام نمبر ۵: حاجی ببل خیل ولد حاجی اسحاق زئی شناختی کارڈ نمبر ---------- دستخط ----------

نام نمبر ۶: بشیر احمد ولد حاجی قمبر شناختی کارڈ نمبر 56302-801357 دستخط

نام نمبر ۷: باجر ولد محمد (مجاخان) شناختی کارڈ نمبر ---------- دستخط ----------

نام نمبر ۸: ملا ستار ولد ارجان شناختی کارڈ نمبر 56302-1291632-1 دستخط عبداللہ

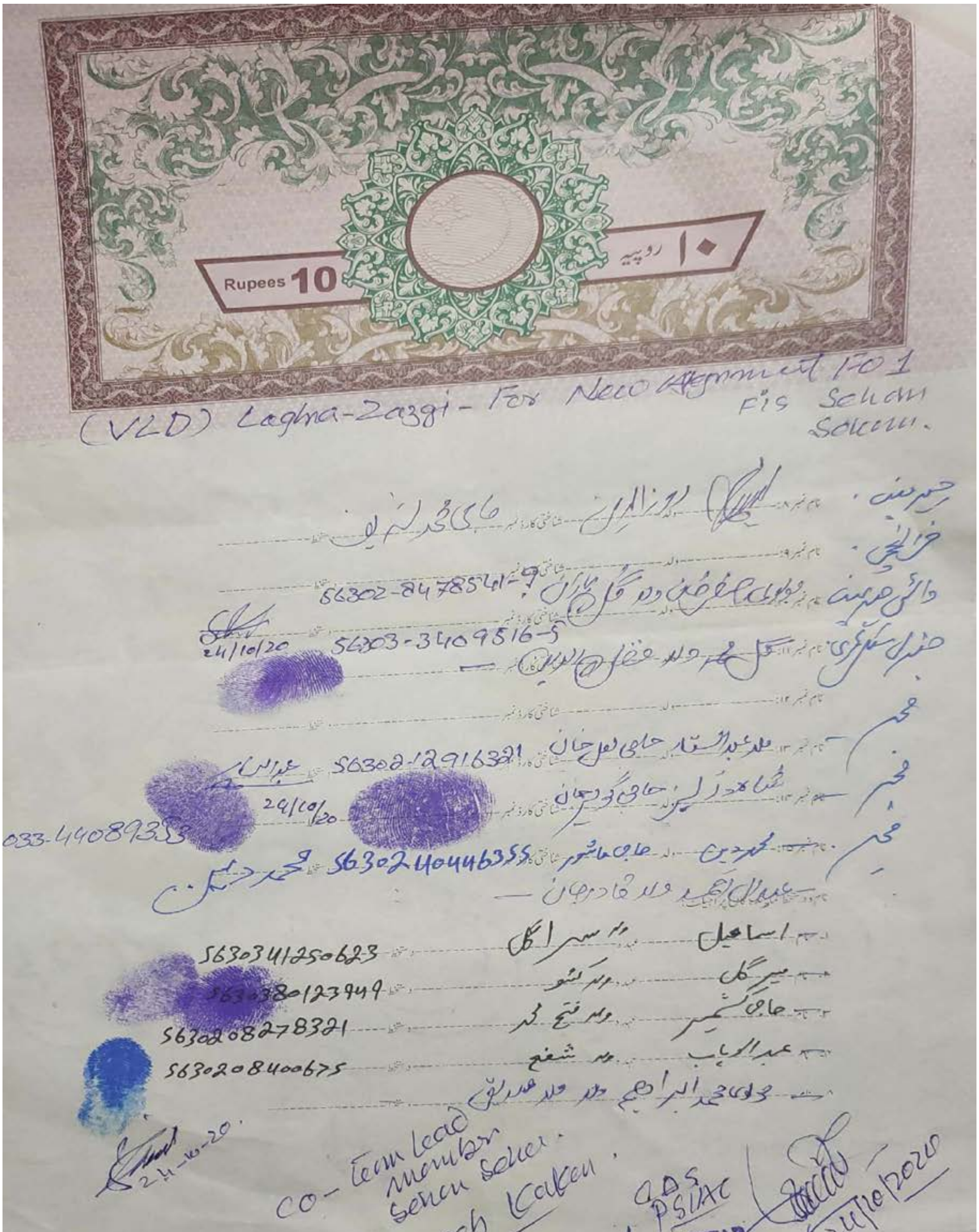
نام نمبر ۹: گل محمد ولد فضل الدین شناختی کارڈ نمبر 56302-3409116 دستخط

نام نمبر ۱۰: گل محمد اطرف ولد طور شناختی کارڈ نمبر 56302-0827609 دستخط

CDS Shakoor Kakar

12/11/2020

TEHSILDAR MEHTA
Assistant Collector (Revenue)
12/11/2020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56303412S0623
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5630208278321
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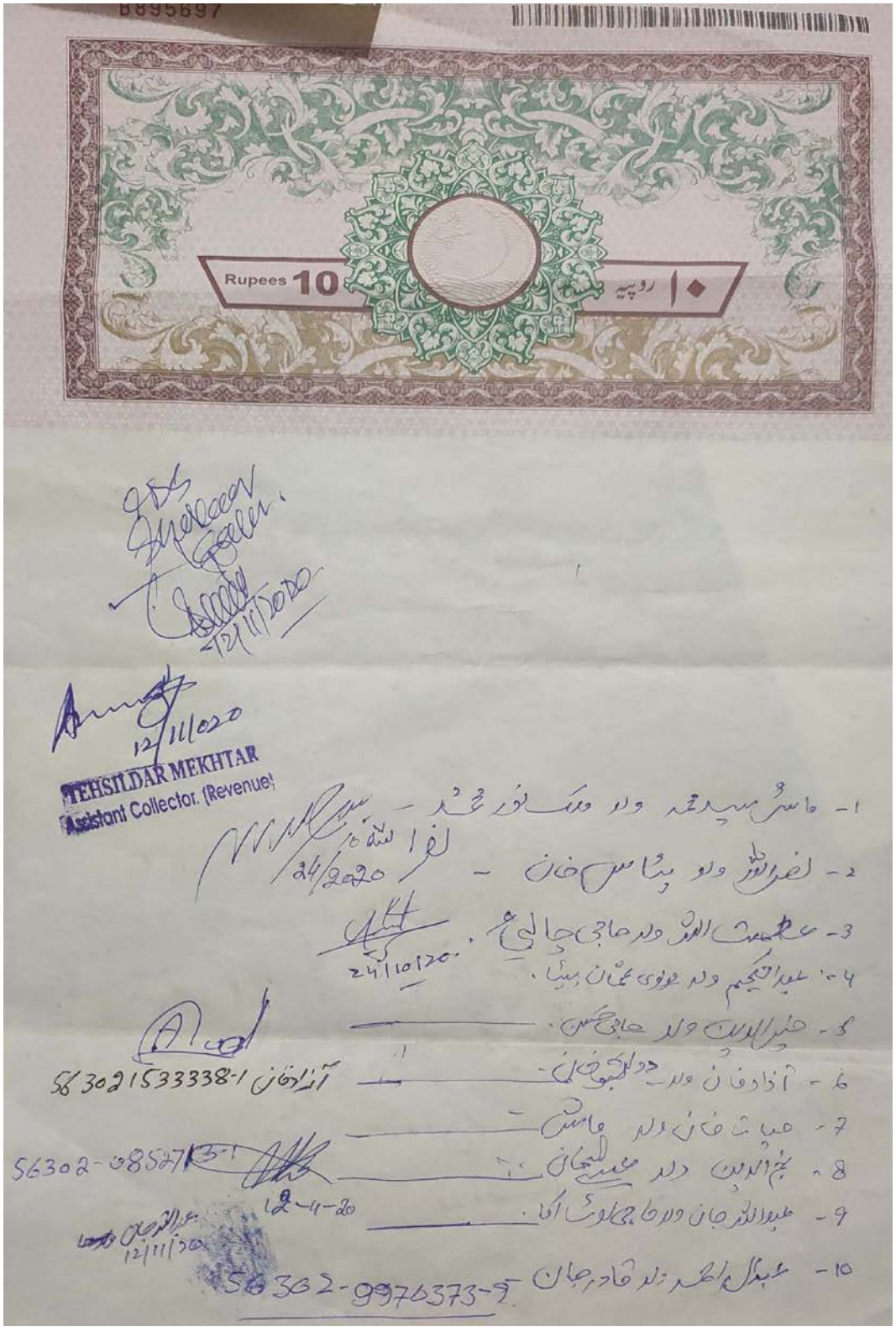
24-10-20
CO-Team Lead Member Sehan Sokar.
Naqeeb Kakar.
CDS PSIAC
TEHSILDAR MEKHTAR
Assistant Collector of Revenue
24/10/2020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۱۰ روپیہ
12/11/2020
TEHSILDAR MEKHTAR
Assistant Collector. (Revenue)
12/11/2020
24/11/20.
12-4-20
12/11/20

Appendix E. Monthly Monitoring Checklist

Site/Location: _____

Month: _____

Dated: _____

S. No	Description	Yes	No	Comments
Health and Safety				
1.	Has a health & safety induction been provided to all staff starting this month?			
2.	Are any staff under the age of 18?			
3.	Are first aid stations/kits available at all Camp and construction sites?			
4.	Have there been any incidents/accidents this month? i. Was the accident recorded? ii. Have measures been taken/practice improved/Corrective action reports are prepared to prevent the accident reoccurring?			
5.	Is staff wearing all necessary PPE?			
6.	An adequate number of fire extinguishers available at all campsites?			
7.	Appropriate barricade, fencing erected at working areas/construction site?			
8.	Accident/incident, near misses record register available site and properly reported with corrective actions?			
9.	Guard rails or equivalent protection erected (at height or excavations) to stop falls?			
10.	Is the construction site is free from trip hazards?			
11.	Is the construction site is free from trip hazards?			
12.	Scaffolds/work platforms properly erected?			
13.	Use of harness belt?			
14.	Signage's displayed?			
15.	Emergency drills conducted?			
16.	Emergency telephone numbers displayed?			

17.	Is all staff aware of the emergency procedures?			
18.	Broken plugs, sockets, switches observed?			
19.	Frayed or defective lead observed?			
20.	Is work being carried out near exposed live electrical equipment?			
21.	Storage material Labelled correctly?			
32.	Is material data sheets available?			
33.	The danger of a falling object?			
34	Are Drum's stacks stable?			
35	Are training records available?			
36	Warning notices in place to stop people using an incomplete scaffold or telephone			
37	Individual employees from working in excavations are unsupervised?			
38	Are workers protected from the moving parts of the machine by installing and maintaining proper guards?			
39	At least one first aid kit is provided and kept stocked at all times at the structural site?			
40	Has all new staff signed the Code of Conduct?			
Site Security Arrangements				
1.	Emergency Preparedness and Response Procedures prepared and included in CHSP.			
2.	Risk assessment conduct and included CHSP			
3.	Walk through survey conducted on daily basis before commencement of activity			
4.	Private Security guards available all the time at site			
5.	Emergency drills are conducted as per schedule given in CSHP			
6.	Assembly area marked and visible			
7.	Physical measures are in place to prevent access to or passage through restricted areas, such as a fence, gates, signage, guards, fences, surveillance systems			
8.	Contact numbers at the worksite of the fire department, hospitals, and law enforcement agencies at the camp site and work areas			
9.	Training to workers on the identification of potential hazards particularly those that may be life-threatening and suspicious activity are provided			
Pollution Prevention and Control				
1.	Is cement dust spreading from the batching plant or storage areas during refilling?			
2.	Ae plant and equipment being wash downed outside the designated wash down areas?			

3.	Are fire extinguishers available?			
4.	Are plant & vehicle refilling only in designated and bunded areas or are drip tray used?			
Contractor Camp Sites				
1.	Are gas cylinders at labor camps provided for cooking purposes?			
2.	Is stagnant water accumulating in the camp sites?			
3.	Is reliable electricity and lighting supplied in the labor camps?			
4.	Are washing facilities including showers are provided and regularly cleaned?			
5.	Is a sheltered kitchen area provided which is separated from living quarters?			
6.	Are vehicles parked in designated parking areas at campsite?			
7.	Water sample test being conducted of each water source from an approved laboratory?			
8.	The water samples tested are safe for drinking water purpose?			
9.	All water storage tanks are covered to avoid the risk of contamination?			
10.	Are there any chemicals (waste oil, petrol, solvent) near to the drinking water point?			
11.	Are the latrines more than 50 feet away from the water drinking point?			
12.	Are fire extinguishers available at all camp site?			
13.	Are fire extinguishers periodically inspected and replaced prior to expiry			
14.	Are fire extinguisher easily accessible and their path clear			
15.	Is contractor staff using local wells or hand pumps?			
16.	Are septic provided for the disposal of sewage waste?			
17.	Is fencing provided and maintained around the camp site?			
18.	Are Private security guards present at project sites?			
19.	Is groundwater entering the landfill site?			
20.	Is recycling waste or medical waste disposed of in the camp site?			
21.	Is first aid box/kit facility available at camp sites?			
22.	Have littered waste been observed at camp site?			

23.	Are emergency access routes in all campsite are signed and maintained?			
24.	Floors to room are constructed of float finished concrete or other similar solid or washable material?			
25	All Labor dormitories and kitchen areas are regularly cleaned and maintained in hygiene condition?			
26	Are kitchen areas are built up/raised of smooth, easily cleanable, non-toxic and non-corrosive surface for food preparation?			
27	Are agreement with operator of municipal facilities where are used for ultimate disposal of sanitary waste			
Storage Areas				
1	Are storage areas built above flood levels and on leveled ground?			
2	Are any materials stored outside designated storage areas?			
3	Are all storage areas clearly labelled and each of the container are clearly marked?			
4	Are stockpiles of construction materials being eroded by wind?			
5	Are construction materials entering watercourses, drains or being spread along transport routes?			
6	Are storage areas built near to watercourses, drains and transport routes?			
7	Are stock pile are regularly sprinkled which have the potential to particulate matter in the locality?			
8	Is the hazardous material storage area secured, and locked when not in use?			
9	Are warning signs displayed at entrances to hazardous material stores and is necessary PPE depicted?			
10	Is the floor of the hazardous material storage area impervious and is a bund provided around it?			
11	Is the necessary PPE used when handling hazardous materials?			
12	Are any leaks or spills observed in storage areas?			
13	Are spill kits provided at storage areas?			
14	Are fire extinguishers provided at hazardous material storage areas?			
15	Is fuel stored in a double skinned bowser or surrounded by a bund on an impervious floor?			

16	Is storage area constructed on impervious floor and dike provided to avoid contamination of soil and ground?			
Traffic Management Plan				
•	Fuel or oil leaks observed from any vehicle?			
•	Are Contractor's vehicles exceeding speed limits on public highways?			
•	Are barricades, flagmen & signs provided where haulage routes cross highways?			
•	Is mud observed on route ways ?			
•	Are ruts & scars resulting from the Contractor's operations observed?			
•	Are delivery vehicles queuing on public highways?			
•	Are vehicles overloaded?			
•	Is water sprinkling is being carried out at project area?			
•	Are public highways blocked?			
•	Are any vehicles exceeding 40km/hr. on site?			
Waste Management and Disposal Plan				
•	Is waste stored in areas defined in the waste management plan?			
•	Is hazardous material safely and securely stored in a designated storage areas?			
•	Was any waste observed littering the site?			
•	Are containers segregated according to waste type?			
•	Is solid waste being disposed of in the approved site by the engineer?			
•	Are sanitary waste are safely disposed of through burial?			
•	Has any hazardous waste been disposed of through burial?			
•	Where any waste material is disposed of through burning, have all charred remains been removed			
•	Is liquid waste entering water courses?			
•	Is adequate number of waste bins provided at all camp and consruction site??			
•	Is the waste disposal burial area fenced?			
•	Is sufficient number of waste bins provided at camp and working sites?			

Appendix F.1: Lists of Male Participants during Pubic Consultation

Appendix F. List of Participants: Public Consultation, Formation of FO and WDGs

Table F.1.1: List of Participants Raj Bandi Village

Date	Name of Participants
07/06/2020	Haji Aqal Khan Hamzazai s/o Malak Haji Alam Khan
	Abdul Salam Musakhail Tehsildar
	Haji Abdul Majeed
	Haji Toor S/ o Haji Abdul Kareem
	Muhd Rafiq S/o Abdul Majeed
	Mohammad Bashir
	Molvi Amen Ullah S/o Abdul Majeed
	Haji Najeeb Ullah S/0 Essa Khan
	Paind Khan S/o Dawlat Khan
	Haji Naik Muhd
	Lal Mohammad
	Khan Zaman
	Naik Mohammad
	Gull Mohammad
	Kamal Khan
	Saleem Shaikh S/o Pasha Shaikh
	Kareem Shaikh S/o Kharot Shaikh
	Abdul Wahab
	Haji Atta Khan
	Juma Gul S/o Zarghoon
	Molvi Sattar S/o Lal Khan
	Naseeb Shaikh S/o Shashak Shaikh
	Baz Shaikh S/o Gulab Shaikh
	Hameed Ullah S/o Safi
	Haji Abdullah
	Saad Gull
	Master Syed Mohammad
	Alam Khan
	Abdul Gahffar
	Faqeer
	Abdul Rasool

Table F.1.2: List of participants (Male) at Raj Bandi village

Date & Location	Name of Participants
27/08/2020	Haji Aqal Khan Hamzazai s/o Malak Haji Alam Khan
	Najam Khan Naib Tehsildar

	Haji Abdul Majeed
	Abdul Ghafoor
	Aman Shaikh
	Mohammad Bashir
	Molvi Amen Ullah S/o Abdul Majeed
	Haji Najeeb Ullah S/0 Essa Khan
	Paind Khan S/o Dawlat Khan
	Haji Naik Mohammad
	Naik Mohammad
	Gul Mohammad
	Kamal Khan
	Kareem Shaikh S/o Kharot Shaikh
	Abdul Wahab
	Juma Gul S/o Zarghoon
	Molvi Sattar S/o Lal Khan
	Naseeb Shaikh S/o Shashak Shaikh
	Hameed Ullah S/o Safi
	Haji Abdullah
	Saad Gul

Table F.1.3: List of Participants (Male) at Inter College Mekhtar

Date & Location	Name of Participants
23/10/2019	Haji Aqal Khan Hamzazai s/o Malak Haji Alam Khan
	Abdul Salam Musakhail Tehsildar
	Molvi Rozi Din S/o Mohammad Sharif
	Haji Toor S/ o Haji Abdul Kareem
	Wahab Shaikh
	Mohammad Bashir
	Molvi Amen Ullah S/o Abdul Majeed
	Abdul Qadir S/o Mahsh
	Paind Khan S/o Dawlat Khan
	Alam Khan
	Gul Mohammad
	Khan Zaman
	Noor Ahmed
	Gull Mohammad
	Kamal Khan
	Saleem Shaikh S/o Pasha Shaikh
	Kareem Shaikh S/o Kharot Shaikh
	Abdul Wahab
	Haji Atta Khan
	Juma Gul S/o Zarghoon
	Molvi Sattar S/o Lal Khan
	Naseeb Shaikh S/o Shashak Shaikh
	Baz Shaikh S/o Gulab Shaikh
	Hameed Ullah S/o Safi
	Haji Abdullah
	Saad Gull

	Master Syed Mohammad
	Alam Khan
	Abdul Gahffar
	Faqeer
	Abdul Rasool

Table F.1.4: List of Participants (Male) at Gohar Jan Zizgai & Laghara village

Date & Location	Name of Participants
12/06/2020	Malak Abdul Ghafar S/o Haji Abdullah
	Abdul Sattar S/o Lal Khan
	Abdul Malik Gul Din
	Gohar Jan S/o Torak Khan
	Abdul Wahab S/o Akhtar Muhammad
	Haji Saeed Ahmed S/o Haji Gul Muhammad
	Ashraf jan
	Sardar Muhammad
	Haji Naik Muhammad
	Shah Wazir
	Abdul Salam
	Master saeed
	Molvi Sattar Muhammad S/o Haji Lal Muhammad
	Haji Bail Khail
	Molvi Safar S/o Gul Baran
	Molvi Rozi Din S/o Mohammad Sharif
	Haji Bashir
	Haji Abdul Qadir S/o Haji Mash
	Alam Khan S/o Fazal Khan

Table F.1.5: List of Participants (Male) at Jamal Khan Zizgai & Laghara

Date & Location	Name of Participants
28/08/2020	Abdul Wahab
	Malak Abdul Ghafar S/o Haji Abdullah
	Abdul Sattar S/o Lal Khan
	Abdul Malik Gul Din
	Gohar Jan S/o Torak Khan
	Abdul Salam
	Abdul Mana
	Ashraf jan
	Sardar Muhammad
	Haji Naik Muhammad
	Molvi Sattar Muhammad S/o Haji Lal Muhammad
	Haji Bail Khail
	Molvi Safar S/o Gul Baran
	Molvi Rozi Din S/o Mohammad Sharif
	Haji Abdul Qadir S/o Haji Mash
	Haji Abdullah Jan
	Kaleem Ullah Environment Complain Expert

Appendix F.2: List of Participants during FO Formation Meeting

Table F.2.1: List of Participants (Male) at Raj Bandi village

Date	Name of Participants
10/06/2020	Haji Aqal Khan Hamzazai s/o Malak Haji Alam Khan
	Kareem Shaikh S/o Kharot Shaikh
	Abdul Sattar S/o Abdullah Jan
	Molvi Muhd Amin S/o Abdul Majeed
	Haji Khair u din S/o Abdul Kareem
	Khair u din S/o Haji Hassan
	Saleem Shaikh S/o Pasha Shaikh
	Hameed Ullah S/o Safi
	Molvi Zahir S/o Haji Rafiq
	Hunza S/o Haji Din Muhd
	Fazal Khan S/o Ibrahim Khan
	Haji Toor Jan S/o Haji Abdul Kareem
	Paind Khan S/o Dolat Khan
	Gull Mohammad S/o Jan Muhd
	Juma Gul S/o Zarghoon
	Haji Atta Khan S/o Essa Khan
	Baz Khan S/o Gulab Shah
	Naseeb Shaikh S/o Shashak Shaikh

Table F.2.2: List of Participants (Male) at Zizgai village

Date & Location	Name of Participants
11/06/2020	Molvi Rozi u din S/o Muhd Sharif
	H. Abdul Qadir S/o Haji Mash
	Molvi Safar S/o Gul Baran
	Molvi Abdul Sattar S/o Haji Lal Khan
	Abdul Wahab S/o Muhd Sharif
	Ramazan S/o Rehman Khan
	Alam Jan S/o Fazal Khan
	Abdullah Khan S/o H. Jamal Khan
	M. Ismail S/o Seria Khan
	Abdul Khaliq S/o Abdul Rasheed
	Kawat Khan S/o Chopan
	Gul Muhd S/o Fazal u din
	Rozak Khan S/o Gul
	Dostak Khan S/o Haji Gul
	Babo S/o Rahsool Dad
	Safar Khan S/o Gul Behram

Appendix F.3: List of Women Participants in Public Consultations

Table F.3.1: List of Women Participants Raj Bandi Village

Date	Name of Participants
11/06/2020	Syra Bibi
	Afzana Bibi

	Robina Bibi
	Shah Naaz Bibi
	Hirana Bibi
	Qeemat Bibi
	Robina Bibi
	Bibi Narai
	Taj Bibi
	Bakht Naama
	Saboon Bibi
	Firangai Bibi
	Bahadura Bibi
	Bibi Sardaro
	Tamam Bibi
	Shah Tareena
	Bibi Zaino
	Zulekha Bibi
	Merawa Bibi
	Mahjabeen
	Gul Bashra Bibi
	Bibi Feroza
	Zahra Bibi
	Zarkoona Bibi
	Mandai Bibi
	Hazrat Bibi
	Sagodha Bibi
	Farzana Bibi
	Samina Bibi
	Zareena Bibi
	Tajuma Bibi
	Aafia Bibi
	Maika Bibi
	Bushra Bibi
	Arfa Bibi
	Rihjana Bibi
	Marwat Bibi

Table F.3.2: List of Women Participants Zizgai Village

Date	Name of Participants
12/06/2020	Bibi Zahida/Bibi Noor Jahan
	Sinzilai Bibi/Wazhe Bibi
	Zarbai Bibi/Pozkai Bibi
	Kawtara Bibi
	Nasira Bibi
	Hameeda Bibi
	Bakhtawara Bibi
	Mashotai Bibi
	Zar Bibi
	Shamila Bibi
	Kawtara Rozak

	Hazrat Bibi
	Shada Bibi
	Islam Bibi
	Shabina Bibi
	Shezadi
	Zar Khara Bibi
	Bibi Rozena
	Janato BiBi
	Safia Bibi
	Patasa Bibi
	Marzaado Bibi
	Zarbai Bibi
	Sinzilai Bibi
	Bibi Zahida
	Khato Bibi Gul
	Zarjuma Bibi
	Momina Bibi
	Zulfiya Bibi
	Sangeen Bibi
	Shazia Bibi
	Santia Bibi
	Raqiya Bibi
	Hazrat bibi
	Bedar Bibi
	Shal Zareena
	Bahadur Jamala
	Badai Bibi
	Laat Bibi
	Bibi Patai
	Zahida Khan
	Phelama Bibi
	Robina Bibi
	Islam Bibi
	Kainat Bibi
	Ruqiya Bibi
	Butkai Bibi
	Kela Bibi
	Rukhsana Bibi
	Sadiqa Bibi
	Nukhtai Bibi
	Hidaya Bibi
	Pokhanda Bibi

Table F.3.3: List of Women Participants Faqeer Mohammad Village

Date	Name of Participants
15/06/2020	Khan Bibi
	Raheela Bibi
	Akhtar Bibi
	Akhtar Bibi

	Laila Bibi
	Bibi Jana
	Fozia Bibi
	Pata Bibi
	Khato Bibi
	Nargisai Bibi
	Naseeb Bibi
	Roznama Bibi
	Babai Bibi
	Gul Nama
	Bayana Bibi
	Khwajida Bibi
	Bakhtawara
	Bibi Rasheeda
	Ghundo Bibi
	Saihira Bibi
	Rahat Bibi
	Fozia Bibi
	Zareena Bibi
	Sofia Bibi
	Zarmeena Bibi
	Rukhsana Bibi
	Shah Tareena Bibi
	Fareeda bibi

Table F.3.4: List of Women Participants Pakistan Bashai Village

Date	Name of Participants
16/06/2020	Iranai Bibi
	Bakht Malo Bibi
	Satara Bibi
	Nazaka Bibi
	Satara Bibi
	Shah Bibi
	Mazai Bibi
	Shalai Bibi
	Gobai Bibi
	Iranai Bibi
	Bakht Malo Bibi
	Nazaka
	Zainaba Bibi
	Taaj Bibi
	Sangeen Bibi
	Zahida Bibi
	Shafia Bibi
	Farkhnda Bibi
	Shakira Bibi
	Saima bibi
	Shumaila Bibi
	Shaheena Bibi

Table F.3.5: List of Women Participants Laghara Badinzai Village

Date	Name of Participants
17/06/2020	Jaan bakhta
	Gulista Bibi
	Patasa Bibi
	Khato Bibi
	Haleema Bibi
	Makhai Bibi
	Jan Bakhta
	Nawab Bibi
	Bibi Nazia
	Patasa Bibi
	Gulista bibi
	Shah perai
	Qadir jamala
	Gul Jam Bibi
	Zarmeena Bibi
	Zandlai Bibi
	Jamila Bibi
	Gul Makai Bibi
	Raazia Bibi
	Roshni Bibi
	Bibi Rozina
	Bibi Shalai
	Bakhmalai Bibi
	Bibi Keema
	Bibi Seema
	Soyi Bibi
	Nasta Biya
	Farzana Bibi
	Tamamai Bibi
	Naseebi Bibi
	Zadai Bibi
	Sakina Bibi
	Hajira Bibi
	Parmeena Bibi
	Bakht Bibi
	Haima Bibi

Table F.3.6: List of Women Participants Mananzai Laghara Village

Date	Name of Participants
18/06/2020	Naazmen
	Hazrat Bibi
	Rahema Bibi
	Momeera
	Balansta Bibi
	Bibi Tahira
	Bibi Khana

	Kaane Bibi
	Ranjo Bibi
	Kela Bibi
	Shakira Bibi
	Hazrat Bibi
	Gul Bibi
	Matak BIbi
	Bibi Shah perai
	Bibi Raheema
	Sabira Bibi
	Bushra Bibi
	Totiya Bibi
	Taj Bibi
	Rasheeda Bibi

Appendix F.4: List of Women Development Groups

Table F.4.1: List of Women Participant in Raj Bandi Village

Date	Name of Participants
10/05/2020	Syra Bibi
	Afzana Bibi
	Robina Bibi
	Shah Naaz Bibi
	Hirana Bibi
	Qeemat Bibi
	Robina Bibi
	Bibi Narai
	Taj Bibi
	Bakht Naama
	Saboon Bibi
	Firangai Bibi
	Bahadura Bibi
	Bibi Sardaro
	Tamam Bibi
	Shah Tareena
	Bibi Zaino
	Zulekha Bibi
	Merawa Bibi
	Mahjabeen
	Gul Bashra Bibi
	Bibi Feroza
	Zahra Bibi
	Zarkoona Bibi
	Mandai Bibi
	Hazrat Bibi
	Sagodha Bibi
	Farzana Bibi
	Samina Bibi
	Zareena Bibi

	Tajuma Bibi
	Aafia Bibi
	Maika Bibi
	Bushra Bibi
	Arfa Bibi
	Rihjana Bibi
	Marwat Bibi

Table F.4.2: List of Women Participant in Zizgai Village

Date	Name of Participants
11/05/2020	Bibi Zahida/Bibi Noor Jahan
	Sinzilai Bibi/Wazhe Bibi
	Zarbai Bibi/Pozkai Bibi
	Kawtara Bibi
	Nasira Bibi
	Hameeda Bibi
	Bakhtawara Bibi
	Mashotai Bibi
	Zar Bibi
	Shamila Bibi
	Kawtara Rozak
	Hazrat Bibi
	Shada Bibi
	Islam Bibi
	Shabina Bibi
	Shezadi
	Zar Khara Bibi
	Bibi Rozena
	Janato BiBi
	Safia Bibi
	Patasa Bibi
	Marzaado Bibi
	Zarbai Bibi
	Sinzilai Bibi
	Bibi Zahida
	Khato Bibi Gul
	Zarjuma Bibi
	Momina Bibi
	Zulfiya Bibi
	Sangeen Bibi
	Shazia Bibi
	Santia Bibi
	Raqiya Bibi
	Hazrat bibi
	Bedar Bibi
	Shal Zareena
	Bahadur Jamala
	Badai Bibi

	Laat Bibi
	Bibi Patai
	Zahida Khan
	Phelama Bibi
	Robina Bibi
	Islam Bibi
	Kainat Bibi
	Ruqiya Bibi
	Butkai Bibi
	Kela Bibi
	Rukhsana Bibi
	Sadiqa Bibi
	Nukhtai Bibi
	Hidaya Bibi
	Pokhanda Bibi

Table F.4.3: List of Women Participant in Faqeer Mohammad Village

Date	Name of Participants
13/05/2020	Khan Bibi
	Raheela Bibi
	Akhtar Bibi
	Laila Bibi
	Bibi Jana
	Fozia Bibi
	Pata Bibi
	Khato Bibi
	Nargisai Bibi
	Naseeb Bibi
	Roznama Bibi
	Babai Bibi
	Gul Nama
	Bayana Bibi
	Khwajida Bibi
	Bakhtawara
	Bibi Rasheeda
	Ghundo Bibi
	Saihira Bibi
	Rahat Bibi
	Shaista Bibi
	Zar Bibi
	Toba bibi
	Naghma Bibi
	Iqra Bibi
	Podeena Bibi
	Rozana Bibi
	Shaira Bibi
	Jamai Bibi

Table F.4.4: List of Women Participant in Pakistan Bashai Village

Date	Name of Participants
14/05/2020	Iranai Bibi
	Bakht Malo Bibi
	Satara Bibi
	Nazaka Bibi
	Satara Bibi
	Shah Bibi
	Mazai Bibi
	Shalai Bibi
	Gobai Bibi
	Iranai Bibi
	Bakht Malo Bibi
	Nazaka
	Zainaba Bibi
	Taaj Bibi
	Sangeen Bibi
	Zahida Bibi
	Shafia Bibi
	Farkhnda Bibi
	Shakira Bibi
	Saima bibi
	Shumaila Bibi
	Fozia Bibi
	Zareena Bibi
	Sofia Bibi
	Zarmeena Bibi
	Rukhsana Bibi
	Shah Tareena Bibi
	Fareeda bibi

Table F.4.5: List of Women Participant in Laghara Badinzai Village

Date	Name of Participants
15/05/2020	Jaan bakhta
	Gulista Bibi
	Patasa Bibi
	Khato Bibi
	Haleema Bibi
	Makhai Bibi
	Jan Bakhta
	Nawab Bibi
	Bibi Nazia
	Patasa Bibi
	Gulista bibi
	Shah perai
	Qadir jamala
	Gul Jam Bibi
	Zarmeena Bibi
	Zandlai Bibi
	Jamila Bibi

	Gul Makai Bibi
	Raazia Bibi
	Roshni Bibi
	Bibi Rozina
	Shaheena Bibi

Table F.4.6: List of Women Participant in Mananzai Laghara Village

Date	Name of Participants
16/05/2020	Naazmen
	Hazrat Bibi
	Rahema Bibi
	Momeera
	Balansta Bibi
	Bibi Tahira
	Bibi Khana
	Kaane Bibi
	Ranjo Bibi
	Kela Bibi
	Shakira Bibi
	Hazrat Bibi
	Gul Bibi
	Matak BIbi
	Bibi Shah perai
	Bibi Raheema
	Sabira Bibi
	Bushra Bibi
	Totiya Bibi
	Taj Bibi
	Rasheeda Bibi
	Bibi Shalai
	Bakhmalai Bibi
	Bibi Keema
	Bibi Seema
	Soyi Bibi
	Nasta Biya
	Farzana Bibi
	Tamamai Bibi
	Naseebi Bibi
	Zadai Bibi
	Sakina Bibi
	Hajira Bibi
	Parmeena Bibi
	Bakht Bibi
	Haima Bibi

Appendix F.5: Meeting with District Administration

Table F.5.1: List of Participant in consultative meeting with District Administration

Name of Participants	Designation
Mr. Asad Khan Kakar	Deputy Commissioner Loralai

Mr. Abdul Salam Musakhail	Tehsildar Mekhtar
Mr. Yar Mohammad Khan	Superintendent Engineer Loralai
Mr. Waseem Babai	SDO Irrigation Loralai
Mr. Abdul Jabbar	Deputy Director EPA (PMU)
Mr. Arif Khan	Social Safeguard Specialist (PMU)
Mr. Ehsan Kakar	Social Organizer (PSIA)
Mr. Saranjam	Community Organizer (PSIA)
Mr. Bilal Ahmed	Social Organizer (PSIA)
Mr. Shakoor Kakar	Community Development Specialist (PSIA)
Mr. Naqeeb Ullah Kakar	Community Organizer (PSIA)

Appendix G. Integrated Pest Management

The Proposed Integrated Pest Management Plan (IPMP) of BIWRMD Project

Objectives

The main objectives of the Pest Management Plan are:

• Promotion of IPM: To minimize pesticide usage while increasing the productivity of agricultural crops targeted in the BIWRMD Project through Integrated Pest Management (IPM), Integrated Plant and Soil Nutrient Management (IPSNM) and Good Agricultural Practices (GAP), because they include the rational use of chemical pesticides, promote cultural practices and the use of nutrients from organic resources;

• Management of Pesticides: To monitor the pesticides management such as their usage before, during and after, and the level of pesticide residues on targeted crops in normally-treated and IPM-treated areas and to disseminate information to stakeholders on the usefulness of undertaking IPM practices.

• Capacity Building: To raise awareness of all stakeholders about the IPM approach to crop management, and train extension agents and farmers through FFS system to become practitioners of IPM.

Strategy

The main elements of the strategy would be to promote IPM practices in Balochistan, which do not absolutely exclude the use of pesticides yet it promotes an integrated approach to use all available options for controlling pest population with no adverse effect on human beings, animals and the environment that eventually results in attaining sustainable productivity. IPM practices aim at increasing the complexity and diversity of the insects and animals within an agro-ecosystem to encourage its sustainability. IPM practices do not envision agricultural fields devoid of insect life but they essentially from part of an eco-system of agricultural crop management.

The traditional agricultural extension and research systems are not equipped well enough to deal with the complex situations emerging in the crop management area. There is a dire need for these services to meet the new challenges. Farmers need to upgrade their basic knowledge of crop management, while extension agents need to perceive themselves as facilitators of change.

The strategy calls for sensitizing the decision makers and key officials also on the importance of IPM, particularly on the promotion of GAP and the rational use of pesticides.

The Farmers Field Schools (FFS) methodology would be adopted to introduce, promote and implement, among others, GAP and IPM approaches. The key elements of FFS entail training of facilitators (ToF) or lead facilitators (LF) whereby such training system focuses on each trainee, whether a farmer or an

extension agent (Government, NGO or specific gender focused) or a researcher, first practices the skills under an expert advice from a lead trainer to reach a minimum level of competency, and then practices further until the trainee has mastered the skills. Thereby such facilitators of change, having undergone ToF they would have acquired knowledge about environmental conservation, public health, social participation, and organization, and become. Further, farmers are trained by facilitators through group participation, known as FFS in comparing new techniques in systematic field evaluations. Therefore it is essentially a field-based participatory training where extension agents and farmers work together for the duration of a cropping season. The expected output of such training is that farmers become more self-reliant and are able to evaluate new technologies by themselves, whereas extension agents are enabled to facilitate the change processes. The latter group carries out dialogues with farmer on public interest issues, including environmental conservation and health; whereas research institutions, with feedback from extension groups as well as direct observation, are enabled to provide technologies that can be tested in the field by farmers.

The concept of Integrated Plant and Soil Nutrient Management (IPSNM) would be also incorporated into the GAP because it complements the IPM practices. The strategy for IPSNM would include:

a) Improving crop rotations by growing legumes as food crop or live mulch (cover crop);

b) Maximizing organic matter production through green manure, cover crops and agro-forestry;

c) Enhancing natural processes of nutrient recycling through managing plant-soil-pest-predator interactions;

d) Providing soil cover (mulch, cover crops) to supply nutrients, reduce weeds and labor, and enhance functions of soil biota and plant roots;

e) Selecting and breeding crops with higher nitrogen use efficiency, resilience to deficiencies and nitrogen fixing capacity; and

f) Maximizing crop, soil and animal biodiversity to reduce diseases and pest outbreaks.

The Participatory Development Technology (PDT) being the main investment mode at the farmer level for the targeted crops, also aims at improving crop productivity, would be implemented through the FFS. The focus of all PDT groups is on new technologies and methods of crop protection and improved cultural practices, among others, that are also the core of IPM practices. Through the PDTs the farmers apply a number of new technologies, along with IPM, in perennial (such as date palm) and horticultural crops (chilies and onions). Important ingredients in the PTD approach also entail comparing the traditional methods of crop protection practices with the IPM based new technologies

Activities Proposed for the IPMP

Review of Policy and Laws. The Balochistan provincial government will work on formulating its own pesticide policy based on its IPM experience. Further work on these aspects, such as policy development, reforms, amendments or update for IPM/GAP will be required.

Awareness Programs. To disseminate awareness programs, adequate resources are provided in the SAGP to use all media that include print and electronic media, newspapers, agricultural department's monthly magazine, seminars, workshops, exposure visits of farmers/project staff, field demonstrations, etc. The main areas that would be covered for the promotion of GAP, IPM and IPSNM practices would relate to human health, like pesticide handling, usage, storage and disposal, other health hazards, types of pesticide application equipment, protective gears, eco-friendly alternatives and promotion of bio-pesticides. The capacity building on IPM will be mainstreamed into the overall capacity building component of the project.

Farmer Field Schools (FFS). About 50 Lead Trainers or Trainers of Facilitators (LT/ToF) and 125 Extension Facilitators (EF) and well over 110,000 farmers would be trained. While most LTs would focus on the Participatory Development Technology (PDT) aspects, such as varietal suitability, production technologies, post- harvest handling and marketing requirements, some of these LTs would be commodity specific; 3 for dates and 1 each for onions and chilies. Apart from them, 4 IPM managers, based at the district headquarter level commodity clusters, would coordinate and monitor the inclusion and due emphasis on the IPM/IPSNM and related practices and technologies in the FFS agenda. The 50 LTs/ToFs would train 125 EFs in different commodity/crop zones. An estimated total 6,800 FFS groups will be formed over the course of the implementation period, each comprising from 15-20 producers. As the PDT items are demand driven and the nuclear FFS group formation would be PTD and GAP, the number of FFS may vary in the phasing or in eventual totals if there is a lag in demand, or low demand persists for certain technology items. During the curriculum development (see Annex 2, section 2.8), safe pesticide management and use would be a principal chapter of the IPM related topics.

Integrated Plant and Soil Nutrient Management (IPSNM). The IPSNM approach uses both organic and inorganic fertilizers in proper proportion accompanied by sound cultural management practices and seeks to both increase agricultural production and safeguard the environment for future generations. Research has proved that neither inorganic fertilizers nor organic fertilizers alone can achieve a sustainable productivity of soils as well as crops under highly intensive cropping systems. The application of organic fertilizers needs to be encouraged to increase the soil water holding capacity in view of the ever increasing water scarcity. Institutional capacity on the IPSNM will be strengthened by short refresher courses for the officials of the Plant Protection Directorate of the Agricultural Extension Department and District Officers (Agriculture) that would be arranged through the University of Balochistan, Quetta, the various ARIs and resource persons from other credible institutions in Balochistan.

Pilot Demonstrations on IPSNM. A pilot scale demonstration, in a cluster of FFS groups, would be undertaken in the project area to promote the use of organic fertilizers/residues, composting and mulching. Since the activity would initially affect farmer income and only benefit him in the longer term, suitable financial incentives would be provided to the farmers under the project to compensate them for the losses incurred. About 10-15 demonstration one acre plots for each of three horticultural crops to promote IPSNM would be laid out, and their results would be monitored by the IPM managers and their teams PIMU.

Pesticide Residue. Under the FFS system, samples of pesticide residue on the crops, would be collected from the control and IPM treated plots and the quantity of pesticide residue determined. The control plots are where prevalent practices of pesticide use are undertaken and experimental plots where farmers' practice of IPM are carried out. This would help establish the usefulness of adopting IPM practices. The work of pesticide residue determination would be contracted out to existing research laboratories that possess the desired facilities (University of Balochistan, Quetta). Monitoring of pesticide residue would be carried out throughout the project period and information disseminated widely to help bring down the level of residue to below the Maximum Residue Limit (MRL). Annual monitoring will be conducted for all project interventions that focus on on-farm productivity enhancements. Post-harvest use of pesticides, on the produce of commodities would also be monitored. An analytical study on the work done would be prepared in the last year of the project period.

Implementation Responsibility and Institutional Arrangements

The Director General (DG), Agriculture Extension Balochistan will be responsible for agricultural extension activities of the project with major focus on FFS approach, in which IPM, IPSNM and GAP activities would be the principal capacity building measures whereby the core investments under the

PDT activities would also be carried out. The Directorate of Plant Protection (PP) under the DG will help implementing the IPM related activities. The Director PP who is assisted in his work by a Plant Protection Officer and three Agricultural Officers at the headquarter level, will have additional support of 4 IPM Managers under the SAGP, who would be placed at the district headquarters level project implementation units (PIUs). In the field, District Governments handle this work through a hierarchical setup: Deputy Director, Agricultural Extension at District level; Assistant Director at Taluka level, Agricultural Officer at Sector level, and Field Assistant at the Union Council level. Thus the actual frontline workers who would implement the activities are Sector Agricultural Officers and Union Council Field Assistants.

The horizontal linkages in the area of pest management between agriculture research and extension and vertical linkages between DG Extension and District Government are not strong. There are two main reasons for this: firstly, the operational budget for pest management, both for extension and research, is very small and there is little research or extension work that could to be shared; and secondly, Extension and Research officials report directly to their superiors and horizontal collaboration is only on a needs basis. In such a situation, the role of the existing Research-Extension Coordination Committee becomes much more important. It would be the endeavour of the government to ensure that this committee meets regularly on a monthly basis. IPM Managers and Deputy Directors (Agriculture Extension) would be actively associated with these committees.

Monitoring and Evaluation

Monitoring would involve establishing a baseline of the current status of crop yields, agronomic practices particularly cropped area sprayed (number of sprays and quantity of pesticides used), knowledge and adoption of IPM measures; and observing the adoption rates IPM/IPSNM and related activities (GAP/PDT) and measuring the impact of project interventions on the target crops disaggregated by farm type and gender, by over the project period. Mid-term and post-project evaluations would also be carried out. The following key monitoring indicators are suggested: quantity of pesticide used; number of sprays and area sprayed by crop; pesticide residues on fruits and vegetables; and the use of banned pesticides, if any. Pesticide residue studies would be carried out for crops where on-farm productivity enhancements are planned on an annual basis, with a baseline study establishing the indicative baseline numbers for selected pesticides for each crop (chili, onion, dates and rice) for the province.

Cost

The following costs associated with implementation of this IPMP in terms of pesticides usage and residue monitoring shall be included as part of the studies for component C of the project. The awareness raising activities shall be streamlined with the capacity building components of the project.

Item	**In PKR**	**Amount (USD)-***exchange rate 201* PKR
Baseline Pesticide Residue Study	3,140,000	15,621.8
Annual Pesticide Residue Survey (4)	6280,000	31,243.7
Soil Testing for IPSNM	1570,000	7,810.9
Total	**10,990,000 PKR**	**54,676.6**

Recommendations

IPM work done so far in the country has been mainly donor driven and on a pilot scale. The National IPM project is going on for the past decade was the first major indigenous endeavor funded through the public sector development program. Consideration has been given to have an independent provincial IPM project; however before fully embarking upon such a project, it would only be appropriate to wait for the implementation experience and ex-post evaluation of the National IPM Project. Beside this, the key recommendations concerning the promotion of IPM are:

(i). **Monitoring of Pesticide Use and Residue**. The work of testing pesticide residue on agricultural crops, particularly fruits and vegetables, should eventually be done on payment basis by existing research laboratories. Samples would be collected from control and experimental plots of the on-going and future Nat-IPM programs under the ToF/FFS system, in association with FFS groups. The test results would thus establish the usefulness of adopting IPM practices. Monitoring of pesticide use and residues would be carried out throughout the project period and efforts made to bring down the level of residue to below MRL. After establishing a baseline of pesticide usage, post-harvest use of pesticides, particularly on vegetables and rice would also be monitored;

(ii). **Integrated Plant and Soil Nutrient Monitoring and Management**. A pilot scale operation would be undertaken in the project area to promote the use of organic fertilizers/residues in association with the FFS-initiated producers' groups. About 10-15 such groups per commodity groups would be to establish an equal number of one-acre demonstration plots to promote IPSNM in their farming practices. Soil testing of the demonstration plots would be carried out to determine the physical and chemical properties and macro and micronutrients of soil. The activities to be demonstrated would inter alia include: use of organic fertilizer, green manuring, mulching, weeding, nitrogen fixing by legumes, composting, and worm culture. The plots would be maintained for two years; and

(iii). **Awareness Raising/Dissemination of Information**. Printed brochures, pamphlets, and booklets on various aspects of IPM and IPSNM would be prepared and distributed widely through FFS groups. Apart from these groups of producers, the circulation of the departmental agricultural magazine should be increased to reach maximum number of stakeholders, which, among others, would include government officials, particularly of the newly established district governments and their lower tiers, water user groups (WCAs, FOs), educational institutions, pesticide manufacturers and sellers, farmers, NGOs, and women. Seminars at district and provincial levels for discussing project achievements would also be held. The main areas that would continue to be covered for the wider audience would relate to human health, like pesticide handling, usage, storage and disposal, other health hazards, types of pesticide application equipment, protective gears, eco-friendly alternatives to pesticides including bio-pesticides, and promotion of IPM and IPSNM practices. The awareness raising on IPMP will be streamlined into the general capacity building for the project.

Appendix H. Checklist of 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 applicable 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 liaise with the Provincial and/or Federal conservation authority to ensure that any chance finds are managed and protected.

Chance Find Procedure

Chance finds 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 responsible authorities 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 applicable. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered or observed

Appendix I. SOPs during Implementation of Civil Works

The following SOPs shall be followed during the implementation works.

1. Working on Site

The following SOPS shall be implemented:

- Before resuming the work, the contractor should ensure the disinfection of camp premises and this should be done on regular basis subsequently.
- Contractor representative (Project Manager) in consultation with PSIA and PMU staff and PSIA team shall arrange sufficient stock of PPE like coverall, face mask -N95/ surgical mask, hand sanitizer, soaps, temperature guns before the arrival of the workforce on site.
- The contractor should develop hand-washing areas for all the workers, with the facility of clean water and soap.
- Wastewater tank should be developed for the disposal of contaminated water.
- Minimize face to face meetings, on-site maximize telephonic, video, and conference calls as a replacement of physical meetings (where available).
- Maintain physical distance at least 6 feet distance with each other during the meeting.
- Use a face mask and latex gloves while maintaining physical distance
- Use a digital thermometer to screen all the personnel entering site office, site and camp areas and maintain a logbook for record-keeping of temperature readings of all the workers entering office area/building. DO NOT use a traditional mercury thermometer.
- Promote communication with staff to inform if anyone in their contact (such as within their residential area, community, market area, place of visit for work/ meeting/ religious gathering) has developed any symptoms of COVID-19 and restrict their entry to workplace or meeting with staff.
- If an individual's temperature is on the higher side and exhibits symptoms of high fever, he should be investigated by a medical doctor for further symptoms of COVID-19.
- If an individual after examination exhibits all the symptoms of COVID-19 immediate attention should be given and contact Pak Corona Helpline (03001111166) for further guidance on an immediate basis.
- Have details of contact numbers of concerned District Health Officer (DHO), Taluka Hospital and local administration i.e., Deputy Commissioner and Assistant Commissioner. These numbers shall be displayed on notice board.
- Install sanitizer dispensers at the workplace in each room. Make sure these dispensers are regularly refilled.
- Ensure that face masks and / or paper tissues are available at workplaces, for those who develop a runny nose or cough at work, along with closed bins for hygienically disposing of them.
- Signages in local language promoting regular hand washing should be displayed at prominent locations, occupational health and safety officer and Social Officer shall make sure this.
- All persons including officers, labourers, etc. should frequently wash hands for more than 20 seconds regularly with soap or hand sanitizer.
- All bench tops, door handles, working tables, chairs, etc. should be sanitized by using alcohol-based cleaning liquids or hypochlorite-based chemicals (twice a day).

- COVID-19 waste should not dispose in an open area, and it must be contained properly and disposed of properly, through incineration only.
- All staff members should be trained for the COVID-19 waste management.
- All the waste such as face masks, gloves, and other items generated at office and campsites should be stored in a labelled marked container (Hazardous Waste) and should be stored separately in isolation after disinfection.
- In case of any worker/staff member develops the symptoms of COVID-19 he should be referred to the nearest Government facility for the testing.
- In case if any of the worker develops symptoms of COVID-19 he should be thoroughly explained about WHO's guidelines of "Home Care for Patients with COVID-19 presenting with mild symptoms and management of their contact"
- The contractor shall not allow the overage, person with diabetes, lung infection, cancer, or any other team member having chronic health issues HSE Team should check the COVID parameters of each worker before the start of work and record may be shared on the group by 9:00 am every day.
- If any worker found suspected should not be allowed on-site for work and after examination exhibits all the symptoms of COVID-19 immediate attention should be given and contact Pak Corona Helpline (03001111166) for further guidance on immediate basis.
- Daily toolbox talk should include COVID-19 preventive measures on a regular basis and preventive measures should be made mandatory for the contractors and subcontractors.
- All the team members conducting inspections should minimize their time on-site to the barest minimum necessary to ensure compliance with the Specification. DO NOT LINGER on-site and return as soon as possible to the colony.
- All staff must be sprayed and cleaned on returning to the camp and a wash facility has been set up at the site gate.
- The guards may be instructed to enforce these measures. Gloves, masks, shoes and helmet must be left at the gate after spraying.
- All the workers working on site, should be provided with protective clothing; coverall, face masks, gloves and hand sanitizers for their regular use.

2. Communication with Community

- Other forms of communication should be used; posters, pamphlets, the means used should take into account the ability of different members of the community to access them, to make sure that communication reaches these groups.
- Face to face meetings should be avoided or safe distance should be maintained.
- The community should be made aware of the procedure for entry/exit to the site, the training being given to workers, and the procedure that will be followed by the project if a worker becomes sick.
- Community as well workers should be encouraged to use the existing project grievance mechanism to report concerns relating to COVID-19, preparations being made by the project to address COVID-19 related issues, how procedures are being implemented, and concerns about the health of their co-workers and other staff.

3. Material Transportation

- The temperature of the drivers, attendants, loaders, and other staff of the vehicle transporting such materials shall be monitored at entry points along with other indicators of COVID-19 that are flu, cough, and muscular pain, etc. No person(s) associated with such vehicles having any or all symptoms of COVID19 shall be allowed to enter the site or premises.

- The material like steel, wood, and cloth, iron, plastic the COVID-19 for days, therefore, all such raw material shall be properly sanitized and disinfected before entry to site or premises is granted.
- Seating arrangement of such vehicles amongst the individuals occupying it shall be such that 3 feet distance is maintained. Individuals occupying such vehicles shall wash hands with soap before entry into site or premises and, subsequently, their hands shall be sanitized.
- Raw materials, machinery, and any other material required to be processed shall be only allowed to enter the site or premises after the vehicle is completely sanitized and disinfected at the entry point.

4. Infected Persons/Team Member Isolation)

- If an individual after examination exhibits all the symptoms of COVID-19 immediate attention should be given and contact Pak Corona Helpline (03001111166) for further guidance on immediate basis.
- Allocate quarantine quarters at camp site and keep the infected person isolated from the remaining staff until the doctor decides return to the wider community.
- No healthy person will be allowed to enter or access the quarantine quarter at all times not even after wearing proper PPEs.
- Medical doctor handling the infected person for initial first aid; should use following PPEs; medical masks, gown, apron, eye protection goggles or face shield (respirator N95 or FFP2 standard) and boots.

  Healthcare wastes produced during the care of COVID-19 patients should be collected safely in designated containers and bags, treated and then safely disposed.

Appendix J. Certificate of Environmental (Water, Soil, Noise and Air) Quality Testing by QTS

EHS Services
Environmental & Analytical Solutions

EVER GREEN
ENVIRONMENTAL LABORATORY

Date: 6th January, 2021

Baluchistan Integrated Water Resources Management and Development Project

This is to certify that the EHS Services JV Ever Green Environment Laboratory (EGEL) Karachi has been conducted environmental baseline testing Studies for Different Schemes regarding Environmental & Social Management Plans and & Checklists. The samples were collected from 11th September 2020 to 18th October 2020. The scope of monitoring activities by EHS JV Ever Green follows:

Baseline Sampling (Ambient Air/Noise/Water and Soil)					
S. No.	Project Site	Ambient Air Sample	Noise	Drinking Water/ Ground Water Sample	Soil Sample Chemical Test
1	Sehan FIS	02	02	04	02

The baseline environmental monitoring sampling as per above mentioned scope has been conducted by EHS JV Ever Green as per requirement of the project. A comprehensive report of the tests conducted along with analysis and conclusion has been submitted to BIWRMDP, Quetta office on 18th October, 2020.

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Appendix K. Water Quality Results

Table 1: Ground Water Sample 1 (Mekhtar City)

S.#	Parameter Description	NDWQs Limits	Units	Results
Microbiological Analysis Results				
1	Total Coliform	0 cfu/ 100 ml	cfu	196
2	Fecal Coliform	0 cfu/ 100 ml	cfu	105
3	Escherichia Coli (E-Coli)	0 cfu/ 100 ml	cfu	35
Physical & Chemical Results				
4	Color	≤ 15.0	TCU	0.17
5	Taste	Non objectionable	…	acceptable
6	Odor	Non objectionable	…	acceptable
7	Total Hardness as $CaCO_3$	< 500.0	mg/L	231
8	Total Dissolved Solids (TDS)	< 1000.0	mg/L	402
9	pH Value	6.5 - 8.5	SU	7.24
10	Arsenic (As)	≤ 0.05	mg/L	BDL
11	Chloride (Cl)	< 250	mg/L	118
12	Copper (Cu)	2.0	mg/L	0.25
13	Fluoride (F)	≤ 1.5	mg/L	0.21
14	Mercury (Hg)	≤ 0.001	mg/L	BDL
15	Nitrate (NO_3)	≤ 50.0	mg/L	1.61
16	Nitrite (NO_2)	< 3.0	mg/L	0.008
17	Selenium (Se)	0.01	mg/L	BDL
18	Sulphate (SO_4)	250.0	mg/L	61.2
19	Zinc (Zn)	5.0	mg/L	0.21
20	Calcium (Ca)	100.0	mg/L	32.1
21	Magnesium (Mg)	50.0	mg/L	1.54
22	Potassium (K)	10.0	mg/L	1.63
23	Iron (Fe) total	0.3	mg/L	BDL
24	Ammonia (NH_3)	0.05 - 0.5	mg/L	BDL
25	Alkalinity total	NoGL	mg/L	117
26	Bicarbonate (HCO_3)	NoGL	mg/L	109
27	Electrical Conductivity (EC)	NoGL	µs/cm	968
28	Total Suspended Solids (TSS)	NoGL	mg/L	01

Table 2: Ground Water Sample 2 (Mekhtar City)

Microbiological Analysis Results				
1	Total Coliform	0 cfu/ 100 ml	cfu	193
2	Fecal Coliform	0 cfu/ 100 ml	cfu	101
3	Escherichia Coli (E-Coli)	0 cfu/ 100 ml	cfu	32
Physical & Chemical Results				
4	Color	≤ 15.0	TCU	0.16
5	Taste	Non objectionable	…	acceptable
6	Odor	Non objectionable	…	acceptable
7	Total Hardness as $CaCO_3$	< 500.0	mg/L	229
8	Total Dissolved Solids (TDS)	< 1000.0	mg/L	407
9	pH Value	6.5 - 8.5	SU	7.22
10	Arsenic (As)	≤ 0.05	mg/L	BDL
11	Chloride (Cl)	< 250	mg/L	119
12	Copper (Cu)	2.0	mg/L	0.24
13	Fluoride (F)	≤ 1.5	mg/L	0.23
14	Mercury (Hg)	≤ 0.001	mg/L	BDL
15	Nitrate (NO_3)	≤ 50.0	mg/L	1.59
16	Nitrite (NO_2)	< 3.0	mg/L	0.008
17	Selenium (Se)	0.01	mg/L	BDL
18	Sulphate (SO_4)	250.0	mg/L	59.4
19	Zinc (Zn)	5.0	mg/L	0.23
20	Calcium (Ca)	100.0	mg/L	32.4
21	Magnesium (Mg)	50.0	mg/L	1.61
22	Potassium (K)	10.0	mg/L	1.67
23	Iron (Fe) total	0.3	mg/L	BDL
24	Ammonia (NH_3)	0.05 - 0.5	mg/L	BDL
25	Alkalinity total	NoGL	mg/L	119
26	Bicarbonate (HCO_3)	NoGL	mg/L	111
27	Electrical Conductivity (EC)	NoGL	µs/cm	973
28	Total Suspended Solids (TSS)	NoGL	mg/L	01

Table 3: Sehan River Surface Water Sample (upstream and Downstream)

S. #	**Parameter Description**	**NDWQs Limits**	**Units**	**U/S**	**D/S**
Microbiological Analysis Results					
1	Total Coliform	0 cfu/ 100 ml	cfu	213	232
2	Fecal Coliform	0 cfu/ 100 ml	cfu	134	156

3	Escherichia Coli (E-Coli)	0 cfu/ 100 ml	cfu	68	72
Surface Water					
4	Color	≤ 15.0	TCU	0.21	0.14
5	Taste	Non objectionable	…	Acceptable	Acceptable
6	Odor	Non objectionable	…	Acceptable	Acceptable
7	Total Hardness as $CaCO_3$	< 500.0	mg/L	256	285
8	Total Dissolved Solids (TDS)	< 1000.0	mg/L	415	456
9	pH Value	6.5 - 8.5	SU	7.35	7.25
10	Arsenic (As)	≤ 0.05	mg/L	BDL	BDL
11	Chloride (Cl)	< 250	mg/L	120	124
12	Copper (Cu)	2.0	mg/L	0.35	0.41
13	Fluoride (F)	≤ 1.5	mg/L	0.28	0.35
14	Mercury (Hg)	≤ 0.001	mg/L	BDL	BDL
15	Nitrate (NO_3)	≤ 50.0	mg/L	1.75	1.63
16	Nitrite (NO_2)	< 3.0	mg/L	0.009	0.008
17	Selenium (Se)	0.01	mg/L	BDL	BDL
18	Sulphate (SO_4)	250.0	mg/L	57.6	62.4
19	Zinc (Zn)	5.0	mg/L	0.32	0.22
20	Calcium (Ca)	100.0	mg/L	42.5	48.7
21	Magnesium (Mg)	50.0	mg/L	1.62	1.54
22	Potassium (K)	10.0	mg/L	1.42	1.31
23	Iron (Fe) total	0.3	mg/L	BDL	BDL
24	Ammonia (NH_3)	0.05 - 0.5	mg/L	BDL	BDL
25	Alkalinity total	NoGL	mg/L	121	134
26	Bicarbonate (HCO_3)	NoGL	mg/L	112	121
27	Electrical Conductivity (EC)	NoGL	µs/cm	951	986
28	Total Suspended Solids (TSS)	NoGL	mg/L	06	04

Appendix L. TORs of Women Development Group

ضابطہ تعاون

BIWRMDP پروجیکٹ:

BIMRMDP حکومت پاکستان اور ورلڈ بینک کی معاونت سے شروع کیا گیا ایسا پراجیکٹ ہے جس کی سرگرمیوں کا مرکز مقامی کسان اور ان کا استعمال ہونے والا پانی ہے۔ یہ پروجیکٹ کسانوں کی عملی شمولیت کی بنیاد (Participatory Approach) پر کام کرے گا۔ اس پروگرام کے تحت چھ سالہ ترقیاتی پروجیکٹ کے ذریعے مقامی کسانوں کو منظم کیا جائے گا۔ اس پروجیکٹ کی تحت کسانوں کو ابتدائی مرحلے میں کسان انجمن (Farmers Association اور WUAs) کے تحت منظم کیا جائے گا۔ علاقے / گاؤں کی سطح پر بنائی گئی کسان انجمنیں اور WUAs مل کر اس پروگرام میں شرکت کرینگی اور پروجیکٹ کو حقیقی بنیادوں پر کامیاب بنائے گی۔

پروگرام کے اغراض و مقاصد:

(ا) تنظیم کے ممبر کسانوں کی اقتصادی حالت کو بہتر بنا کر دیہی سطح پر غربت کا خاتمہ (Poverty Alleviation) کرنا اور زرعی پیداوار بڑھا کر تحفظ خوراک (Food Security) کو یقینی بنا۔

(ب) خواتین کسان برادری کو امداد باہمی اصول کے تحت منظم کر کے اجتماعی کام کرنے کا جذبہ اور آگاہی پیدا کرنا تا کہ خواتین ترقی کے اجتماعی کاموں میں حصہ لے سکیں۔

PMU اور PIU کی ذمہ داری:

i۔ رُکن خواتین کا شناکاروں کو خواتین ترقیاتی انجمن (WDG) کی تشکیل میں مدد دینا۔ عمومی طور پر ہر گاؤں میں WDG اور اُن کی معاون کسان انجمنیں بنائی جائیں گی اور عہدیداران مثلاً صدر، جنرل سیکرٹری وغیرہ کے انتخاب میں مدد دینا۔

ii۔ ارکان کو ذیلی قوانین کے بارے میں مکمل جان کاری دینا تا کہ وہ WDG کسان انجمنوں اور دیہی تنظیموں کی کارگزاری کو آسانی سے سمجھ سکیں۔

iii۔ تمام رُکن کا اور عہدیداران کی فہرستیں بنا سکیں۔

iv۔ بنیادی اسٹیشنری کا سامان فراہم کیا جائے گا۔ تا کہ وہ اپنے اجلاسوں کی کارروائی اور دیگر ریکارڈ محفوظ کر سکیں۔

ضابطہ تعاون

ہم ممبران خواتین ترقیاتی انجمن (WDG) اس بات کی یقین دہائی کرواتے ہیں کہ ہم WDG کسان انجمن ..... کے باقاعدہ ارکان ہیں اور یہ کہ ہم نے BIWRMDP کے مقاصد کو سمجھتے ہوئے WDG کے ممبر بننے کا فیصلہ کیا ہے۔ ہم یہ عہد کرتے ہیں کہ انجمن اس پروگرام پر عمل پیرا رہے گی اور اپنا کردار بخوبی ادا کرے گی۔ ضابطہ تعاون درج ذیل ہے۔

ا۔ باہمی رائے سے دو یا دو سے زیادہ ذمہ دار ممبران کو بحیثیت صدر اور جنرل سیکرٹری کو منتخب کرے گی۔ انجمن کا صدر انجمن کے تنظیمی امور میں لیڈر کا کردار ادا کرے گی۔ جبکہ جنرل سیکرٹری ریکارڈ اور رجسٹروں میں اندراج کا ذمہ دار ہوگی۔