Government of the Khyber Pakhtunkhwa, Pakistan

Khyber Pakhtunkhwa Hydropower and Renewable Energy Development Program

Environmental and Social Management Framework

Pakhtunkhwa Energy Development Organization (PEDO)

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List of Acronyms

A/RAP	Abbreviated/Resettlement Action Plan
BP	Bank Practice
BOQ	Bill of Quantity
CSC	Construction Supervision Consultant
C-ESMP	Construction Environmental Social Management Plan
C&W	Communication & Works
DC	Deputy Commissioner
EA	Environmental Assessment
ECP	Environmental Code of Practice
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
EQS	Environmental quality standards
ESHGs	Environmental, health and safety guidelines
ESHS	Environmental, Social, Health & Safety
ESU	Environmental and Social Unit
FGD	Focus Group Discussion
E&S	Environmental and Social
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
GBV	Gender-Based Violence
GoKP	Government of Khyber Pakhtunkhwa
GoP	Government of Pakistan
GK	Gabral-Kalam
GWh	Gigawatt hours
GRC	Grievance Redress Committee
HPP	Hydropower Project
KBP	Kalkot-Barikot-Patrak
KPHREDP	Khyber Pakhtunkhwa Hydropower and Renewable Energy Development
IEE	Initial Environmental Examination
ILO	International Labor Organization
IUCN	International Union o for Conservation of Nature
KP	Khyber Pakhtunkhwa
M&E	Monitoring and Evaluation
MSC	Management Support Consultants
MW	MegaWatt
NEQS	National Environmental Quality Standards
NGO	Non-Government Organization
NTDC	National Transmission & Despatch Company
O&M	Operation and Maintenance
OP	Operational Policy
OHS	Occupational Health and Safety
PAP	Project Affected Person
PCR	Physical Cultural Resources
PEDO	Pakhtunkhwa Energy Development Organization
PD	Project Director
PIC	Project Implementation Consultants
PM	Particulate Matter
PMO	Project Management Organization
PV	Photo Voltic
MSIP	Management Strategies and Implementation Plans
PS	Patrak-Shringal
RPF	Resettlement Policy Framework
ToR	Terms of Reference
WAPDA	Pakistan Water and Power Development Authority
WHO	World Health organization
WB	World Bank
WBG	World Bank Group

EXECUTIVE SUMMARY

The Government of Khyber Pakhtunkhwa (GoKP) through the Pakhtunkhwa Energy Development Organization (PEDO) is planning to implement the **Khyber Pakhtunkhwa Hydropower and Renewable Energy Development Program** (KPHREDP) (the Program), with financial assistance from the World Bank (WB). Under the Program, PEDO intends to develop run-of-river hydropower projects and also implement other renewable energy projects in the Swat River basin.

To address the generic environmental and social impacts of the Program, the present Environmental and Social Management Framework (ESMF) has been prepared, in compliance with the national/provincial regulatory and WB policy requirements. In addition, an Environmental and Social Impact Assessment (ESIA) and an Abbreviated/Resettlement Action Plan (A/RAP) have also been prepared for one of the projects under the Program.

Program Overview

The proposed Program seeks to develop hydropower projects in the Swat River basin and also install solar photovoltaic (PE) systems on these and other hydroelectric assets. The components of this Program are listed below.

- **Component A:**
  - A1. Development of Gabral-Kalam Hydropower Project (HPP) (88MW),
  - A2. Cascade development of the Swat River basin. Currently, two candidate projects are Kalkot-Barikot-Patrak HPP (47MW) and Patrak-Shringal HPP (22MW), both on Panjkora river in the Upper Dir District. However, other projects in particular of the Swat basin can also be considered for inclusion in the Program.
  - A3. Solar PV systems on hydropower assets.
- **Component B**: Institutional Strengthening and Energy Sector Development;
- **Component C:** Environment and Social Management.
- **Component D:** Project Implementation Support and Technical Assistance.

Environmental and Social Impact Assessment

The key component of the Program that has potential environmental and social impacts is Component A which includes the development of hydropower projects of Swat Basin and solar PV projects; and Component B which includes preparation of plans, feasibility and detailed design studies for potential hydropower and renewable energy sites in KP.

An Environmental and Social Impact Assessment (ESIA) for the Gabral-Kalam HPP has been prepared and presented under a separate cover. However, for the remaining projects, the exact locations, alignments, designs, and technologies are yet to be finalized through detailed feasibility studies and designs and hence, the present ESMF has been prepared for these projects in order to provide guidance to carry out detailed assessments once the design details are available. A Resettlement Policy Framework (RPF) has also been prepared to address the involuntary resettlement impacts of these projects and presented under a separate cover.

The present ESMF has been developed to (i) ensure all relevant environmental and social issues are mainstreamed into the design and implementation of the proposed Program and also the projects to be implemented under it; (ii) ensure compliance of the Program with national, provincial and World Bank

requirements; (iii) screen the generic environmental and social impacts of the Program; and iv) describe the methodologies to be followed for the preparation of the appropriate safeguards instruments required for the individual projects under the Program.

Policy and Regulatory Framework

The Khyber Pakhtunkhwa (KP) Environmental Protection Act of 2014 is the main legislative framework related to environmental protection in the Province. In accordance with this Act, the development of hydropower infrastructure will need to be cleared by the KP Environmental Protection Agency (KP EPA) following the procedures given in the Pakistan Environmental Protection Agency (Review of IEE and EIA) Regulations, 2010. These regulations classify the projects into two categories (Schdule1 and Schedule 2) for environmental clearances. Development of hydropower projects of more than 50 MW capacity will fall under Schedule 2 (which requires EIA) and less than 50 MW capacity will fall under Schedule 1 (which requires IEE).

The present ESMF has been prepared in compliance with the World Bank OP 4.01 (Environmental Assessment). Other relevant WB policies include: Natural Habitats (OP 4.04), Physical Cultural Resources (OP 4.11), Involuntary Resettlement (OP/BP 4.12), Forests (OP/BP 4.36), Safety of Dams (OP/BP 4.37) and Projects on International Waterways (OP/BP 7.50).

Environmental Setting

The Gabral-Kalam Hydropower Project is located on the Gabral River in the Swat District, and other two projects are located on the Panjkora River in Upper Dir District. Both the Gabral and Panjkora rivers are the main tributaries of the Swat River. The locations of PV Solar PV and other hydropower projects are yet to be identified.

<u>Gabral-Kalam HPP</u>

The Gabral-Kalam Project is located in mountainous terrain with elevations ranging from 1974 to 2142 meters above mean sea level (amsl) along the Gabral River, while the elevations of the mountains ranging from 3700 to 4300m amsl. The valley at the weir site is narrow (about 100m wide) but gradually widens down to the Kalam town, where it is about 500m wide. Bhan Khwar (or Anakar Khwar) is a major tributary of the Gabral river in the project influence area, which joins the Gabral at 4 km downstream of the proposed weir location. Riverbeds are generally covered with boulders and gravels, which can be used as the aggregates in the proposed construction activities. The valleys along the riverbanks are extensively used for agricultural uses, and the mountains are covered with the forests.

According to the 2017 census report, the population of Swat and Upper Dir districts is 2,309,570 and 946,421, respectively. About 70 percent of the Swat district population and 95 percent of the Upper Dir district population live in rural areas. The average population density of the Swat district is 430 /km^2 and Upper Dir district 260/km^2. The average number of persons in each household is 7.9.

Kalam and Ashuran are the major settlements in the project area, with a population of 12,300 (1351 households) and 5100 people (676 households). Kalam is a major tourist hill station in the region with about 350 hotels, and about 400,000 tourists annually visit this area during the summer.

The Bhan Valley Game Reserve, a community game reserve is located near the project site on the higher mountains of the Bhan Khwar River, a tributary of the Gabral River. The list of threatened species that are be found within the game reserve Markhor, Asiatic Black Bear, Musk Deer and snow leopard. The bird fauna in reserve includes Himalayan Snowcock, Chukar, Koklas Pheasant, Himalayan Monal Pheasant, and Snow Partridge.

The aquatic habitat is characterized by cold water, gravel bed, and high discharges. Snow carps (*Schizothorax plagiostomus*) is a common fish species (not listed in IUCN Red List) in the project area. Snow carps are short distant migrants. From April to September (spring and summer, high flows), they prefer upstream headwaters habitat at higher elevations. During September to April (low flows and winter), they prefer lower elevations. In addition to snow carps, the river also includes invasive fish species of brown trout and rainbow trout.

Kalkot-Barikot-Patrak HPP and Patrak-Shringal HPP

Kalkot-Barikot-Patrak and Patrak-Shringal hydropower projects are the proposed cascade of run-of-river projects on the Panjkora River. The influence area of the projects comprising the 25-km long valley of the Panjkora river from the Kalkot village to the Shringal village, is located about 30 to 55 km north of the Dir town in the Upper Dir district. The project area is located in mountainous terrain with elevations ranging from 1460 to 1760 m above mean sea level (amsl) along the Panjkora river, while the elevations of the surrounding mountains ranging from 2600 to 4000m amsl. The valley near the Kalkot (at the weir site at Kalkot-Barikot-Patrak HPP) is wide (about 200 m), which gradually narrows down to the Patrak (at the weir site of Patrak-Shringal HPP), where it is about 50 m wide. Two tributaries, Sisan Khwar and Dora Khwar, join the Panjkora river in the project influence area.

Kalkot and Patrak are the major villages, with a population of 1841 (212 households) and 4394 (616 households), respectively, near the proposed hydropower projects (under component A2) on Panjkora river in Upper Dir. The Upper Dis district is one of the poorest districts in the KP. The majority of the people in the project can be considered poor due to limited livelihood opportunities. Agriculture is the major occupation in the project area, though the agricultural lands are limited. The project area is connected with the road from Dir.

The Parit Gol and Ghina Gol Game Reserve (in Chitral District), which is located about 20 km from the proposed project sites in Upper Dir, is the nearest protected area. The list of threatened species that can be found within the 50 km of the project area include two critically endangered birds (White-rumped vulture and Sociable lapwing), two endangered mammals (Woolly flying squirrel, and Kashmir musk deer), four endangered birds (Pallas's fish-eagle, Saker falcon, Egyptian vulture, and White-headed duck) and one endangered fish species (golden mahseer).

The aquatic habitat is characterized by cold water, gravel bed, and high discharges. Snow carps (*Schizothorax plagiostomus*) is a common fish species (not listed in IUCN Red List) in the project area. Snow carps are short distant migrants. From April to September (spring and summer, high flows), they prefer upstream headwaters habitat at higher elevations. During September to April (low flows and winter), they prefer lower elevations. In addition to snow carps, the river also includes invasive fish species of brown trout and rainbow trout.

Screening of Potential Impacts and Risks

The development of the proposed Program will have an overall positive impact on the country due to the generation of low carbon and environment-friendly electricity. The communities in the project area will also be significantly benefitted through the creation of employment opportunities as well as implementation of local area development programs. However, the Program is also likely to have the following potential impacts and risks during construction stages:

- Land acquisition and involuntary resettlement due to siting of project facilities and reservoir formation
- Loss of natural vegetation and trees due to land clearing under project footprints
- Loss of livelihood due to the permanent acquisition of agricultural lands

- Impact on residential structures, and wood and fruit trees
- Generation of spoils (excavated material) and their disposal
- Generation of construction waste including hazardous waste
- Generation of solid waste from worker's campsites and offices
- Wastewater discharges from the construction camps, sites, and batching plants
- The potential risk of soil pollution by construction works
- Increased traffic on the local roads
- Air and noise pollution from construction and traffic
- Sourcing of aggregates for concrete works
- Impact on river habitat due to construction activities and drying of river section between two cofferdams
- Impacts from increased human activities on flora and fauna
- Safety hazards due to increased traffic especially for children and elderly people
- Community exposure to work hazards
- Dust from vehicular movement on local roads and construction activities
- Risk of damage to houses by blasting activities (through fly rock and vibration)
- Impacts from the influx of labor from the outside areas
- Possible cultural conflicts between communities and workers and health impacts, including women's privacy and access, and gender-based violence
- Workers' health and safety risks mainly due to risks involved with instream construction, underground construction, and freezing winter conditions.

The potential impacts and risks during routine operation and maintenance stages of the projects under the Program are given below.

- Impact on fish migration due to construction of the weir
- Impact on aquatic ecology on the downstream of the weir, up to the tailrace, due to reduced flows in winter
- Generation of solid waste from the staff colony
- disposal of batteries and damaged/disused solar cells from the solar PV systems
- Development of environmental improvement facilities in the project area through the local area development program
- Social impacts during Operational stage
- Community health and safety of the PEDO staff and family living in the colony
- Impacts from electric and magnetic fields from transmission lines on community health and safety
- Workers health and safety during routine operation and maintenance.

Project Screening Criteria

A screening exercise was completed for already identified three hydropower subprojects. For other subprojects that are yet to be identified, a screening exercise (Annex 2) will be carried out once they are identified through a reconnaissance site visit. The purpose of this visit will be to initiate the environmental and social assessment of the project, to assess the baseline conditions of the area, to identify the key environmental resources and social features of the area, to identify any environmental and or social sensitivity of the area, and to determine presence of any environmental and or social hotspots in the area. A checklist will be filled for other subprojects that are yet to be identified based upon the findings and observations of the reconnaissance visit.

An ESIA will need to be carried out for each hydropower subproject under the Program. However, for other renewable subprojects, such as Solar PV installations, if the screening process concludes that the project is likely to have significant and or irreversible negative environmental and or social impacts, an ESIA will need to be carried out. If the screening process concludes that the project is likely to have a low to moderate level of negative impacts, an Environmental and Social Management Plan (ESMP) will be prepared prior to initiate the subproject. In case the subproject is likely to cause resettlement impacts, a RAP or ARAP will also be prepared.

Preparation of ESIAs and A/RAPs

The present ESMF presents the step-by-step procedure to be followed for carrying out environmental and social assessment studies for the proposed projects in compliance with the provincial, national, and World Bank requirements. The ESIA and ESMP templates and Environmental Code of Practices (ECP) to address generic construction impacts have been prepared and presented in this ESMF, which will guide the design and implementation of the projects. An entitlement matrix with details on compensation to be paid to affected households to compensate for the various types of losses associated with land acquisition and resettlement has also been prepared and included in the present ESMF. The detailed procedure to prepare A/RAPs are given in the RPF, presented under a separate cover. The ESIAs, ESMPs and A/RAPs will be submitted for World Bank and KP EPA clearance after appropriate consultation with stakeholders and disclosure before starting of construction works of respective projects.

Institutional Arrangements

PEDO will establish a Project Management Organization (PMO) for the implementation of the Program. The Environmental and Social Unit of PMO will include a number of environmental and social specialists (two directors, three deputy directors and six assistant directors) and the recruitment process for the hiring of these specialists is currently under progress. The staff of PMO will be responsible for overall supervision of the implementation of the Program, including this ESMF. The PMO will engage the services of independent consultants to conduct ESIAs and prepare ESMPs for projects. The Supervision Consultants and Contractors will have an adequate number of environmental, social, health and safety specialists to supervise and implement ESMPs and A/RAPs. The cost of preparing and implementing ESIAs, ESMPs and A/RAPs, including land acquisition and local area development programs, has been estimated at USD 13 million and USD 50 million, respectively, for the overall Program. A three-tier grievance redressal mechanism will be established to address the concerns and complaints of the stakeholders including affected communities and workers.

Consultation and Disclosure

Public consultations were conducted during the preparation of this ESMF with all the relevant stakeholders, including the local communities, to share the Program details and this framework, and invite feedback and input from the stakeholders. This ESMF will be disclosed on both PEDO and World Bank websites. Executive summary of the ESMF and the Entitlement Matrix will be translated into Urdu and will be published on the PEDO website, and hard copies of these documents will be made available at local government offices for public access. The ESIA and A/RAP documents to be prepared for proposed projects will also be consulted upon and disclosed on the PEDO and World Bank websites and will be made available to the local communities by placing them at local union council offices.

1 Introduction

The Government of Khyber Pakhtunkhwa (GoKP) through the Pakhtunkhwa Energy Development Organization (PEDO) is planning to implement the **Khyber Pakhtunkhwa Hydropower and Renewable Energy Development Program** (KPHREDP) (the Program) and is seeking financial assistance from the World Bank (WB). Under the Program, PEDO intends to develop hydropower projects and also implement other renewable energy projects in the Swat River basin.

To address the generic environmental and social impacts of the Program, the present Environmental and Social Management Framework (ESMF) has been prepared, in compliance with the national/provincial regulatory and WB policy requirements. Similarly, a Resettlement Policy Framework (RPF) has also been prepared to guide the resettlement planning of individual projects under the Program. In addition, an Environmental and Social Impact Assessment (ESIA) and an Abbreviated/Resettlement Action Plan (A/RAP) have been prepared for one of the projects under the Program. The RPF, ESIA and A/RAP are available under separate covers.

1.1 Background

Pakistan is suffering from an acute power and energy crisis, which is primarily caused by the increasing gap between the supply and the demand for electricity. The current (2017) generating capability of Pakistan is 19,020 MW in summer and 14,833 MW in winter, whereas the current demand is about 25,117 MW. Thus, the current shortfall is 6097 MW and 10,224 MW in the summer and winter seasons, respectively. Pakistan's power needs are increasing with a growth rate of 7 to 8 % (according to Pakistan Electric Power Company), the demand will be 96,000 MW by 2029-2030) whereas the generation additions are too slow to accompany the same pace, and there will be insufficient generation to meet the future demand in the coming years.

Per Capita Energy Generation and Consumption in Pakistan is among the lowest in the Word. The per capita energy generation of Pakistan in 2017 was 585 kWh, and per capita energy consumption in 2017 was 475 kWh. The per capita energy consumption in Pakistan is significantly lower than the average of middle-income countries (2355 kWh), and the neighboring countries of China (4475 kWh) and India (1122 kWh). According to the recent census of 2017, there are over 32 million households in Pakistan do not have access to electricity.

The Energy Generation of Pakistan is mainly from Fossil Fuels. The total installed generating a capacity of Pakistan in 2017 was 28,172 MW in which 18,190 MW (64%) are from thermal sources, 7,115 MW (25%) from hydro, and the rest 2866 MW are from other renewable and nuclear sources. The major problem with the thermal is the high cost of electricity generation. These plants are not running up to their full capacity due to their dependence on imported fuel. With limited indigenous oil, Pakistan has to import over 70% of its requirements resulting in a debilitating drain on the country's balance of payments. Lack of foreign exchange to pay for fuel supplies has resulted in the production of electricity below the capacity of the present plants. Although several gas-field plants have been commissioned during the last two decades, the reserves in these gas fields are dwindling. The energy sector is also the largest contributor to Pakistan's greenhouse gas (GHG) emissions at 46 percent of total emissions.

Lack of access to and poor reliability of electricity causing huge losses to Pakistan's economy. Lack of access to electricity and power shortages result in long hours of load shedding, impacting households, industrial and commercial activities. Lack of power affects people's quality of life, schools, colleges, clinics and hospitals; shops and businesses, reducing sales and revenues; and industry, reducing productivity. It also deters investment. This means, on a macro level, reduced economic growth, which translates into

the loss of livelihoods, jobs, and income. The financial impact of load shedding has been estimated at 3 percent to 4 percent of GDP, costing about USD 10 billion a year. This situation is causing serious economic losses to the country and is responsible for increased unemployment and poverty. According to some estimates, Pakistani households spend about US$ 2.3 billion annually on alternative lighting products and services such as kerosene, gasoline, and battery-powered lighting.

Potential has Immense Hydropower Potential, most of which lies in Khyber Pakhtunkhwa Province. Pakistan is endowed with a hydropower potential of 40,000 MW, in which about 25,000 MW potential lies in Khyber Pakhtunkhwa province. The total installed hydropower capacity in the country is about 7,000 MW, in which about 4,000 MW is in Khyber Pakhtunkhwa province. Pakistan Water and Power Development Authority (WAPDA) is a federal agency responsible for developing major to mega hydropower projects in the country, while the PEDO is the provincial agency responsible for developing major hydropower projects within the KP. PEDO, with the support of the German government, has identified several projects with an overall potential to generate 6,000 MW through the public sector, private sector, or public-private partnership. PEDO has approached the World Bank for funding of three priority hydropower projects identified in the above study.

World Bank Support in Hydropower Sector in KP. World Bank has been currently supporting the WAPDA on the implementation of two hydropower projects in KP, a 4500 MW Dasu Hydropower Project on Indus and 2820 MW Tarbela 4th and 5th Extension Hydropower Projects on Indus. Word Bank has also positively responded to the request of PEDO for financing its hydropower projects through the proposed Program.

1.2 Khyber Pakhtunkhwa Hydropower and Renewable Energy Development Program

The proposed '**Khyber Pakhtunkhwa Hydropower and Renewable Energy Development Program**' (the Program) aims to help address the issues discussed in the previous section through the development of renewable energy sources in KP. The Program will have the following components:

- **Component A:**
    - A1. Development of Gabral-Kalam Hydropower Project (HPP),
    - A2. Cascade development of the Swat River basin. Currently, two candidate projects are Kalkot-Barikot-Patrak HPP and Patrak-Shringal HPP, both on Panjkora river in the Upper Dir District. However, other projects in particular of the Swat basin can also be considered for inclusion in the Program.
    - A3. Solar PV systems on hydropower assets.
- **Component B**: Institutional Strengthening and Energy Sector Development;
- **Component C:** Environment and Social Management.
- **Component D:** Project Implementation Support and Technical Assistance.

1.3 The Proposed Projects

The projects that have currently been identified under Component A of the Program are listed below; additional projects may be selected during the Program implementation.

- Gabral-Kalam (GK) Hydropower Project on the Gabral River, near the Kalam town in the Swat District, to develop an 88-megawatt (MW) hydropower and generate about 341-gigawatt hours (Gwh) annually.

- Kalkot-Barikot-Patrak (KBP) Hydropower Project on the Panjkora River, in the Upper Dir District, to develop a 47 MW hydropower and generate about 225 GWh annually.
- Patrak-Shringal (PS) Hydropower Project on the Panjkora River, in the Upper District, to develop a 22 MW hydropower and generate about 109 GWh annually.
- Solar PV projects to be installed on the hydropower and other sites.

Location. The locations of these projects are shown in **Figure 1.1**.

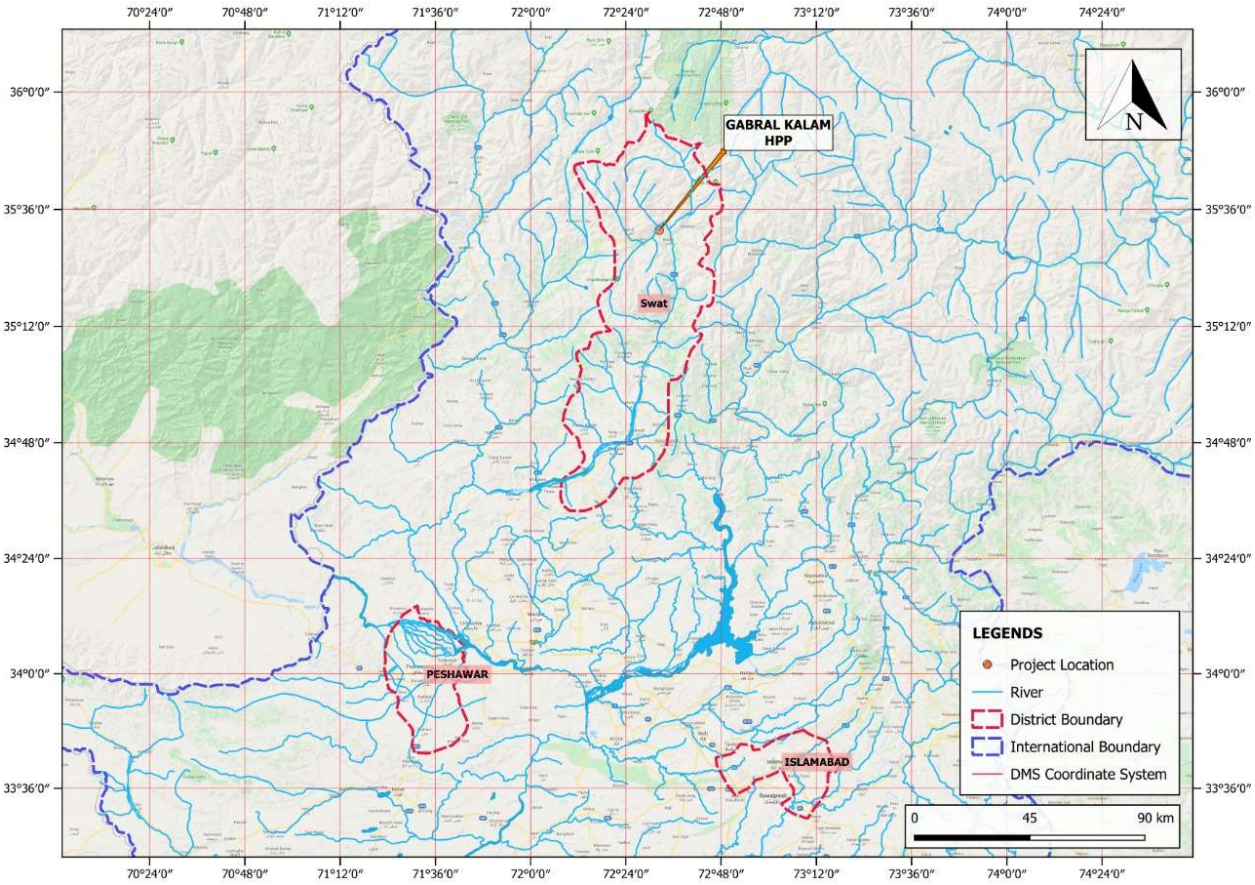

Figure 1.1: Locations of Proposed Hydropower Projects

Proposed Works. A description of the proposed facilities to be built under each subproject is given in Chapter 2. However, in general, these facilities include:

- Power Generation Component: Weir, intake channel from the weir to the sand trap, sand trap, headrace tunnel, surge shaft, penstock, powerhouse, and tailrace
- Power Evacuation Components: Switchyard and transmission line.
- Installation of solar panels and their ancillaries.

1.4 Environmental and Social Assessment of the Projects

The proposed projects under the Program are likely to have potential environmental and social impacts, and hence require detailed environmental and social assessments in compliance with the government

and World Bank requirements. Feasibility study for Gabral-Kalam HPP has been completed and the detailed engineering designs are in progress, and hence ESIA and RAP have been prepared for this project and available under separate covers. However, for the remaining projects, only preliminary studies have been carried out and detailed feasibility studies are yet to be carried out to confirm the locations of the proposed project facilities, alignments of the tunnels and transmission lines, and designs of these facilities. These feasibility studies will be carried out during the Program implementation. The present ESMF has been developed to:

- integrate the environmental and social concerns into the identification, design, and implementation of all the Project interventions in order to ensure that those are environmentally and socially sustainable;
- ensure all relevant environmental and social issues are mainstreamed into the design and implementation of the subprojects;
- consider in an integrated manner the potential environmental and social risks, benefits and impacts of the program and identify measures to avoid, minimize and manage risks and impacts while enhancing benefits; and
- provide guidance to conduct ESIAs, prepare ESMPs and carry out resettlement planning studies for the projects under the Program in compliance with the government's policies, acts, and rules as well as with the World Bank's safeguard policies and guidelines.

This ESMF presents detailed guidelines on preparation of ESIAs and ESMPs of the projects, including: (i) Environment and Social Screening, (ii) Description of Surrounding Environment (establishment of "baseline environment" against which impacts of the proposed project would be evaluated); (iii) analysis of alternatives; (iv) identification of major project activities during both construction and operational phases; (v) assessment, prediction and evaluation of impacts of the Project activities on the baseline environment; (vi) carrying out public consultations; (vii) preparation of environmental codes of practice (ECPs); and (viii) identification of mitigation measures and preparation of impact specific environmental and social management plans (ESMP) including monitoring requirements. In addition to the present ESMF, an RPF has also been prepared, and presented under a separate cover, to guide the preparation of A/RAPs for these projects.

1.5 ESMF Study Methodology

The methodology followed in preparing the present ESMF consists of the following steps:

- Review of the Project details and meeting/discussions with various stakeholders including PEDO and World Bank
- Reconnaissance field visits and initial scoping and screening to determine the key environmental and social parameters and aspects that are likely to be impacted by the Project activities
- Review of environmental and social issues from other ongoing projects in KP of similar nature including World Bank-funded hydropower projects
- Review of the policy and regulatory requirements
- Collection and analysis of baseline environmental and social data, with the help of secondary literature review, and field data collection
- Consultations with the stakeholders including affected communities and developing the consultation process
- Compile the present ESMF document.

1.6 ESMF Study Team

PEDO has engaged the services of two independent environmental and social consultants: Dr. Venkata Nukala and Ms. Samina Islam to develop the ESMF and RPF. They were supported by PEDO's consultants, Dr. Wasim Khan (biodiversity), Prof. Ali Muhammad (fish), Ms. Hina Batool (environment), and Mr. Shaukat Ali Shahid (social) in collecting baseline data and conducting community consultations.

1.7 Content of the Report

Chapter 2 presents a simplified description of the proposed investments under the Program and other salient information relevant to the environmental and social assessment. **Chapter 3** reviews the prevailing government regulatory requirements and relevant to the environmental assessment and World Bank safeguard policies applicable to this Project. Description of the baseline environmental and social conditions is presented in **Chapter 4**. Screening and assessment of potential environmental and social issues have been discussed in **Chapter 5**. **Chapter 6** presents a step-by-step methodology for carrying out environmental and social assessments for the subprojects including the preparation of ESIAs and ESMPs. **Chapter 7** presents the Project institutional structure. Finally, **Chapter 8** describes the consultations that have been carried out with the stakeholders while preparing this ESMF.

2 Program Description

This chapter presents a brief description of the proposed Program and also some specific information on the HPPs included in it. A more detailed description will be included in the ESIA(s) of the individual projects to be implemented under the Program.

2.1 THE PROGRAM INTRODUCTION [1]

Pakistan possesses rich renewable energy resources, including hydropower and about 50 percent of 40,000 MW of hydropower potential lies in KP. The government, at both federal and provincial levels, has started to finance various hydropower schemes. Sites on the River Indus are being developed by WAPDA, a federal entity, while GoKP, through PEDO, is focusing on other rivers flowing through KP. Though at a relatively slow pace, private investors have also started to invest in the development of hydropower. Despite the huge potential the pace and scale of hydropower development are slow. Only 15 percent of Pakistan's total hydropower potential has been developed mainly comprises of few mega hydropower projects, and most of these untapped resources are in the province of KP.

In KP province, hydropower potential is concentrated in districts of Chitral, Dir, Swat, Kohistan, Mansehra and in merged tribal districts. Despite being rich in hydropower resources, some of these remote areas are also facing an acute shortage of electricity. The Program will support the development of cascade on Swat River and Panjkora River and their power evacuation. Three run-of-river hydropower projects have been identified Swat and Panjkora rivers. Their viability has been assessed during Program preparation and will be developed in a sequenced manner matching the availability of funds. In addition, there will be a technical assistance and capacity building component to support Program implementation.

The GoKP, therefore, is pursuing the development of several of these projects through public and private sector and is seeking WB financing for Gabral-Kalam, Kalkot-Barikot-Patrak and Patrak-Shringal hydropower projects and associated/ancillary infrastructure and activities including roads, transmission lines, offices, colonies, preparation and implementation of resettlement and environment and social management plans. These sites were identified in collaboration with German Agency for Technical Cooperation (GTZ) during 1990s and are among the priority projects of the GoKP. Feasibility has been done for these projects but the due diligence by the WB's technical team revealed gaps to the extent that new feasibility studies have to be undertaken.

The Program will support the generation of low-cost renewable energy during the peak demand period of summer months when shortages are at their worse. Increased supply at competitive prices from these hydro schemes would support economic growth for all enterprises that use electricity, particularly in the Districts of Swat and Dir where the identified schemes are located. These two districts rank poorly in terms of socio-economic indicators. Thus, in addition to increasing the supply, the proposed Program supports the World Bank's twin goals of poverty reduction and shared prosperity. Development of the hydropower projects by KP will not only meet its energy needs but will also generate revenues for the GoKP.

2.2 Development Objectives of the Program

The development objective of the Program is to increase installed hydropower capacity and build institutional capacity for further hydropower development in Khyber Pakhtunkhwa. The key results include:

1) Hydropower capacity constructed under the program

[1] Adopted from the Project Information Document/Integrated Safeguards Data Sheet 25-Sep-2017, World Bank.

2) Increase in electricity supply
3) Mobilization of additional finances to accelerate hydropower development by GoKP

In addition to the above key indicators, the Program will also track improved socio-economic services in the project areas. Social Development Plan to improve local living will be part of the projects. Social assessment will help identify specific social schemes in consultation with women and will be implemented under the Resettlement Action Plan to directly benefit women of the area. The Program will improve economic development locally during construction and operation, benefiting the households and businesses alike.

2.3 Program Components

The Program has four components that are briefly described below.

Component A: Development of hydropower and renewable energy projects and associated facilities. This component will support the development of renewable energy projects in a sequenced manner through following sub-components.

(A1) **Gabral-Kalam HPP.** Initially, Gabral-Kalam HPP (GKH) for which feasibility and safeguard documents have been prepared will be tendered. GKH will be about 88MW run-of-river hydropower project located 2km upstream of Kalam town, a major tourist destination in Swat Valley. It will add about 339 GWh annually. Major activities under this sub-component will be:

(A1.1) construction of river diversion, weir, tunnel, powerhouse building/cavern, access roads, project colony, offices, houses, and other ancillary infrastructure; and

(A1.2) installation of turbines, generators and electro-mechanical equipment for the substation/switchyard, transmission line substations, and other ancillaries.

(A2) **Cascade Development of Swat River Basin.** The total hydropower potential of the Swat Basin is over 1,200 MW for which several projects have been identified. Of these two to three projects will be selected for inclusion under this sub-component for which detailed design including the environment and social assessment will be carried out that will form the basis for financing. At this stage Kalkot-Barikot-Patrak and Patrak-Shringal HPPs are candidate projects that meet overall agreed criteria. However, other projects in particular of the Swat basin can also be considered for inclusion in the Program.

(A3) **Solar PV on Hydropower Assets.** Suitable areas for installation of solar panels on existing and/or future hydropower projects and other sites can be selected along the riverbanks, floating panels on lake behind weir, tunnel and on other projects infrastructure to allow additional generation through solar. The cost of solar PVs has come down significantly over the past few years, and solar PVs can be developed quickly and in a modular manner. Cost is expected to be even less when solar PVs are installed on hydropower assets as there will be no land cost and existing facilities (roads, transmission lines) can be utilized for installation of solar PVs also[2]. Floating and land-based solar PVs when combined with GKH will help start generation early, increase total generation, meet local demand and reduce average generation cost. The scope of the solar project would be established during Project Implementation period after detailed studies and analysis.

[2] World Bank report on floating solar is available at http://www.worldbank.org/en/topic/energy/publication/where-sun-meets-water. Also, solar PV potential of various locations in Pakistan can be assessed through *http://globalsolaratlas.info*.

Component B: Institutional Strengthening and Energy Sector Development. This component will help prepare and implement a strategic roadmap and business plan for the development of KP energy systems and associated infrastructure to promote renewable energy, maximize investments and government revenue. It will also entail strengthening of institutional systems and processes so that the Energy Department GoKP and PEDO can efficiently and effectively manage their duties as developer of renewable energy program as well as operations and maintenance of existing and future energy projects. The objectives of this component will be achieved through following sub-components:

(B1) Project Planning and Institutional Strengthening

(B1.1) **Preparation of Plans, Feasibilities and Design Studies**. The work will be carried out with the support of the Planning Consultants. Key elements would be developing a framework to select and prioritize projects, ensure their readiness through pre-feasibility, feasibility, design and safeguard studies, carryout geological investigations and surveys required for each stage, devise project structuring and financing strategy, development of power evacuation plan and grid connectivity and help secure commercial financing and private investments.

(B1.2) **Institutional Strengthening**. This sub-component will help PEDO enhance its capacity to carry out various functions more effectively for a growing portfolio of investments. Management Support Consultants (MSC) will be engaged to support PEDO in implementing Project & Contract Management Systems, Monitoring & Evaluation Program and Information Systems/ERP for various functions e.g. planning, financial management, procurement, operations & maintenance, human resources, etc. The MSC will also support PEDO in program execution, and its management and carry out day-to-day activities. Specific tasks will include developing financing, legal and institutional strategies, recruitment and management of financial and legal services for mobilizing investments, carry-out monitoring and evaluation of plans and project implementation including their environment and social management plans, and contract management including advice on variation orders, settlement of disputes/claims.

(B2) **Accelerating Renewable Energy Development in KP.** This sub-component will help finance upfront preparatory works or common infrastructure to reduce project risk for investors and financiers and fast track project implementation of selected hydropower and renewable energy projects that will be identified under sub-component B1. The IDA funding will supplement government/PEDO's contributions to fund the cost of common infrastructures such as access roads, transmission lines, local distribution networks, and social and environmental cost so that the projects can then be taken-up through public, private or public-private-partnership mode of financing.

Component C: Environment and Social Management. The objective of this component is to improve the environment, local living and economic development in the project area for GKH and other hydropower projects under component A2 as well as solar sites under A3. These sites are in areas with limited access but vast potential for development of local economy. In addition to financing resettlement action plan and environmental management plan, this component will help align hydropower development with broader objectives to support local area development through tourism, social services and improving electricity supply in the project area. For example, GKH project which is located upstream of main tourist hub will be structured in a manner that promotes winter and summer tourism primarily by meeting year-round energy needs, and also by embedding development of tourist attractions/recreational activities for tourists (e.g., water parks in lake area, walking/bicycle tracks, tourist/education centers) in the design of the project.

Component D: Project Implementation Support and Technical Assistance. This component would cover the cost of the consulting and other services to implement the three hydropower projects starting with GKH and solar PV project, as defined under Component A and fulfill training and capacity building needs of PEDO and PMO to effectively implement project-related activities. It will have following sub-components.

(D1) **Project Implementation.** It will cover the cost of Project Implementation Consultants (PIC) for construction supervision of GKH and preparation and construction supervision of two-three other projects of the Swat Cascade, audits, Independent Panel of Experts for design and construction quality, safety enhancement and any other issues that may have to be addressed during the project implementation. It would cover the implementation of all activities under the project including procurement, contract administration, quality control, financial management, preparation of any additional designs and bidding documents, etc. as well as support in implementation of EMP and A/RAP.

(D2) Technical Assistance, training and capacity building.

2.4 Location of Proposed Hydropower Projects

Locations of proposed hydropower sites are given in Figure **2.1**. The location of the GK hydropower project on the Gabral River is confirmed, but locations of KBP and PS hydropower projects on the Panjkora will be tentative and will be confirmed during the detailed feasibility studies to be carried out under the Program.

The proposed weir and powerhouse sites for the KBP hydropower project are located near Kalkot village and Patrak village, respectively. The weir and powerhouse sites are located about 50 km and 40 km, respectively, from Dir town (headquarters of Upper Dir district) by road (N45). Dir is located about 245 km from the Peshawar, the provincial capital.

The proposed weir and powerhouse sites for the KBP hydropower project are located near Kalkot village and Patrak village, respectively. The weir and powerhouse sites are located about 50 km and 40 km, respectively, from Dir town (headquarters of Upper Dir district) by road (N45). Dir is located about 245 km from the Peshawar, the provincial capital.

The proposed weir and powerhouse sites for PS hydropower projects are located near Patrak and Shringal villages, respectively. The weir and powerhouse sites are located about 36 km and 30 km, respectively, from Dir town (district headquarters) by a road (N45).

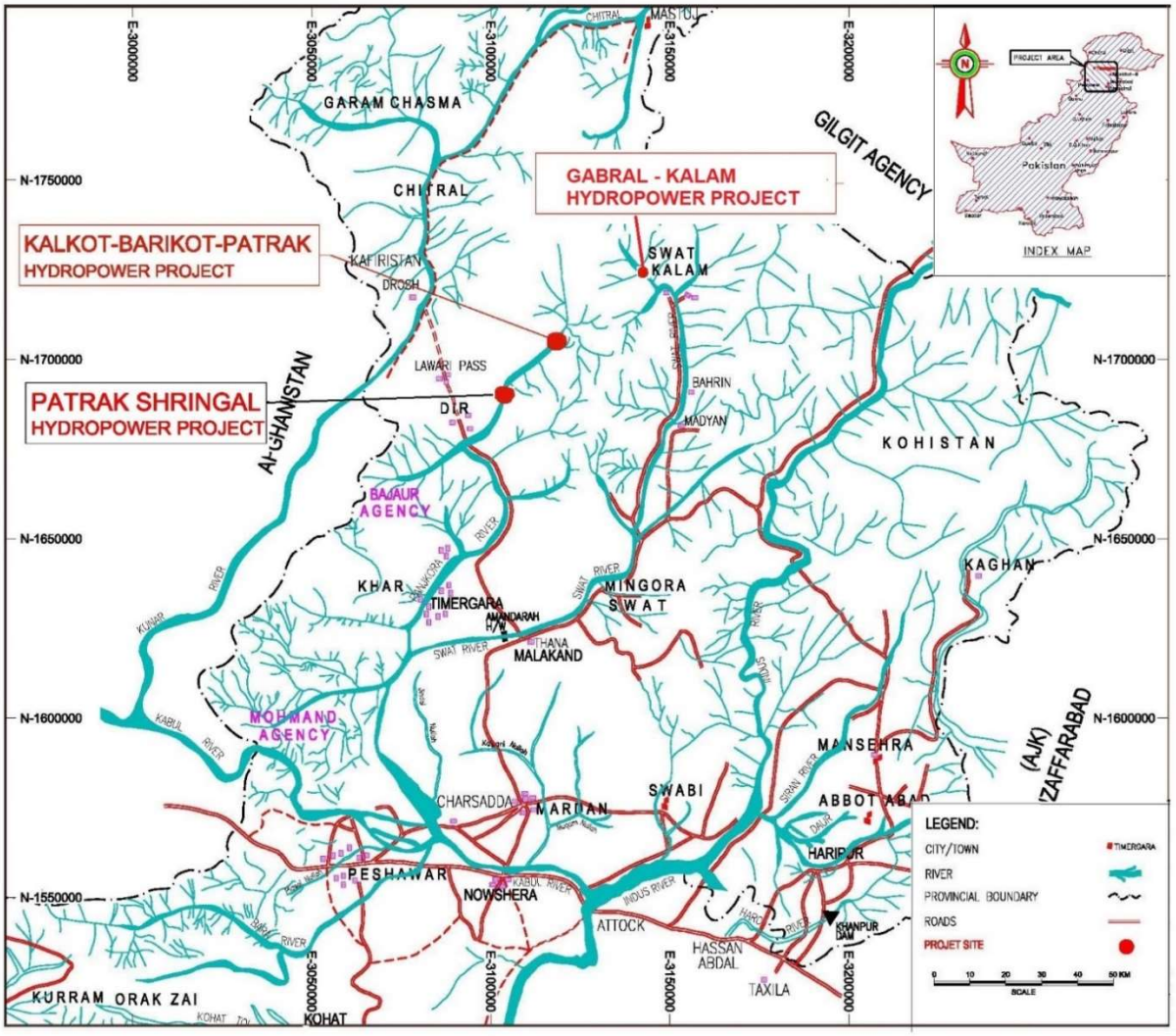

Figure 2.1: Locations of Proposed Hydropower Projects

2.5 Typical Project Facilities

The typical facilities to be proposed for each subproject are shown in **Figure 2.2**. The purpose and objective of each of these facilities are described below.

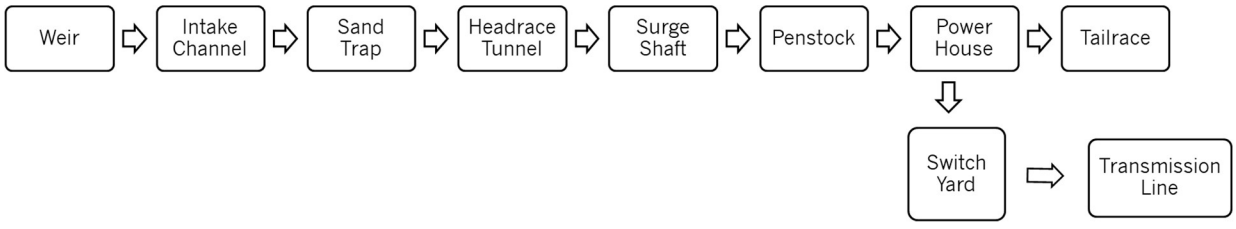

Figure 2.2: Typical facilities to be built for each subproject

Power Generation Facilities include:

- Weir: a concrete gravity dam built on the river for diversion of the water from the river to the powerhouse, and include necessary outlet structures and spillways including a fish ladder
- Intake channel: concrete channel from the intake of the river to the sand trap
- Sand trap: a concrete chamber for temporary holding of water for de-siltation
- Headrace tunnel: An underground tunnel to carry the water from the outlet bay of sand trap to the surge shaft
- Surge shaft: a vertical concrete tank for surge protection arrangements
- Penstock: steel pipes to carry water from the surge tank to the powerhouse
- Powerhouse: an above-ground structure to house turbines and generate power
- Tailrace: a concrete-lined channel to carry water from the powerhouse back to the river

Power Evacuation Facilities include:

- Switchyard: a substation with transformers and other equipment for interconnection between the powerhouse and the transmission line
- Transmission line: A transmission line from the switchyard to the nearest grid station.

In addition to the above, the project will build permanent facilities such as a residential colony for the PEDO staff with all necessary infrastructure and access roads to the weir, powerhouse and colony sites.

In addition to the above permanent facilities, the project will also require establishing some temporary facilities during construction such as contractor's camp and construction yard, spoil disposal sites, waste disposal sites, quarry and borrow areas, and construction of coffer dams and diversion channels.

2.6 Description of Gabral-Kalam Hydropower Project

2.6.1 Project Layout

The location for the GK hydropower site was identified in 1992 by a study carried out with the support of the German government. PEDO is currently carrying out a detailed feasibility study and confirmed the locations of proposed project facilities. A layout of the proposed facilities of the GK hydropower project is shown in **Figure 2.3**. The Project will be designed with an 88 MW installed capacity to generate an annual energy of 341 Gwh. The net head will be 161 m, and the design discharge will be 65 m^3/s. Detailed description of the proposed facilities can be found in the Gabral-Kalam project's ESIA.

2.6.2 Weir

The proposed height of the weir above the riverbed is 21 m and the width is 100m. A photograph of the proposed weir site is shown in **Figure 2.4**. The weir will be designed to withstand a flood capacity of 1731 m^3/s (a 1000-year return flood) through an overflow section and sluicing section. The sluicing section will be used to release environmental flows and spill excel flows and small floods in the summer season.

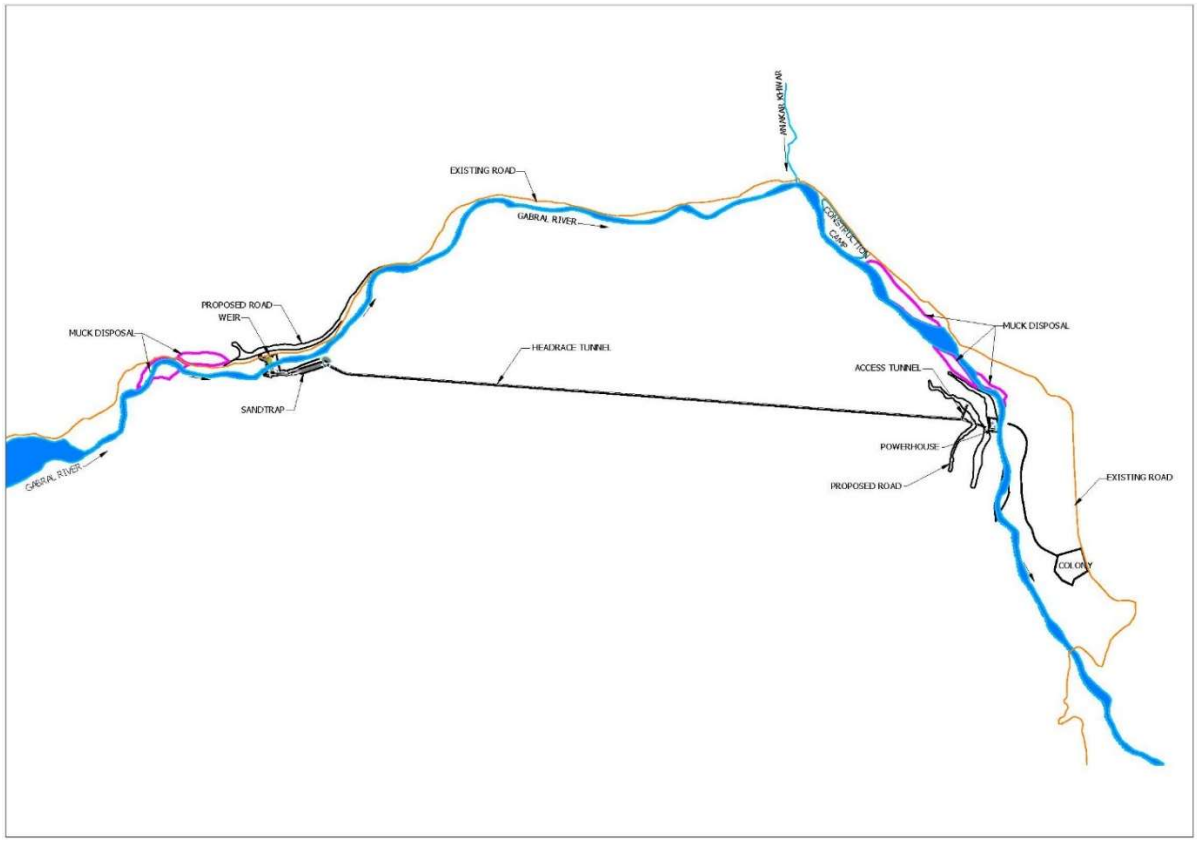

Figure 2.3: Proposed Layout of GK Hydropower Project

Figure 2.4: Proposed Weir Site Location GK Hydropower Project near Kanai Village (towards upstream of the weir site)

2.6.3 Headrace Tunnel

About 4.7 km long underground tunnel will be built to divert the water from the outlet bay of sand trap structure to the surge shaft location. The tunnel width and height will be 5.8 m.

2.6.4 Powerhouse

A powerhouse will be built on the right bank of the Gabral River near the Ashuran village, and the proposed location of the powerhouse is shown in **Figure 2.5**.

Figure 2.5: Proposed Powerhouse Location GK Hydropower Project (towards upstream of the powerhouse site)

2.6.5 Transmission Line

A 2.7 km long 220 kV transmission line will be built from the switchyard to the proposed transmission line to be built (2020-2021) from Gorkin-Matiltan Hydropower Project.

2.6.6 Project Colony and Construction Camp

A project colony will be built for PEDO staff (about 50 families) with the drinking water supply and sanitation facilities. The labor requirement during the construction stage is about 500, in which about 100 will be outside works (50 will be foreigners and 50 will be from Pakistan) and the remaining 400 will be

local laborers. A construction camp will be built for 100 workers with necessary drinking water and sanitation facilities. The duration of construction is four years.

2.7 Tentative Description of KBP Hydropower Project (to be confirmed)

2.7.1 Project Layout

The potential location for the KBP hydropower site was identified in 1992 by a study carried out with the support of the German government. PEDO has further carried out some studies in 2012 to assess the hydropower potential of the site and to develop a preliminary layout of the proposed facilities. The description of the project presented in this section is based on the 2012 study, and hence shall be considered tentative. PEDO will carry out a detailed feasibility and design studies for this project with the funds available under the Program during 2020-2021 to confirm the location of proposed project facilities.

The Project will be designed with a 47 MW installed capacity to generate an annual energy of 225 Gwh. The net head will be 239 m, and the design discharge will be 23 m^3/s. The land acquisition required for the project is estimated at 40 acres.

2.7.2 Weir

The proposed height of the weir above the riverbed is 17 m and the width is 280m. A photograph of the tentative weir site is shown in **Figure 2.6**. The weir will be designed to withstand a flood capacity of 1352 m^3/s (a 1000-year return flood) through an overflow section and sluicing section. The sluicing section can be used to release environmental flows and spill excel flows and small floods in the summer season.

Figure 2.6: Proposed Weir Site Location KBP Hydropower Project near Kalkot Village (towards upstream of the weir location)

2.7.3 Headrace Tunnel

About 11 km long underground tunnel will be built to divert the water from the outlet bay of sand trap structure to the surge shaft location.

2.7.4 Powerhouse

A powerhouse will be built on the right bank of the Panjkora River near the Patrak village, and the tentative location of the powerhouse is shown in **Figure 2.7**.

Figure 2.7: Proposed Powerhouse Location of KBP Hydropower Project near Patrak Village (towards upstream of weir location)

2.7.5 Transmission Line

A 36 km long 132 kV transmission line will be built from the switchyard to the Dir grid station. This will be a single-circuit transmission line for the first 10 km (up to the switchyard of PS hydropower project) and will be a double circuit transmission line for the next 20 km (due to the interconnection of power from PS hydropower project).

2.7.6 Project Colony and Construction Camp

A project colony will be built for PEDO staff (about 20 families) with the drinking water supply and sanitation facilities. The labor requirement during the construction stage is about 500, in which about 100 will be outside works (50 will be foreigners and 50 will be from Pakistan) and the remaining 400 will be local laborers. A construction camp will be built for 100 workers with necessary drinking water and sanitation facilities. The duration of construction is four years.

2.8 Tentative Description of PS Hydropower Project (to be confirmed)

2.8.1 Project Layout

Similar to the KBP hydropower site, the location of PS hydropower was initially identified during 1992 and later assessed during 2012. PEDO will carry out a detailed feasibility and detailed design studies for this project with the funds available under the Program during 2020-2021. Hence the description of the proposed facilities will be tentative and will be confirmed during the proposed detailed feasibility study to be carried out under the Program.

The Project will be designed with a 22 MW installed capacity to generate an annual energy of 109 Gwh. The net head will be 73 m, and the design discharge will be 35 m^3/s. The land acquisition required for the project is estimated at 35 acres.

2.8.2 Weir

The proposed height of the weir above the riverbed is 13 m and the width is 150 m. A photograph of the tentative weir site is shown in **Figure 2.8**.

Figure 2.8: Proposed Weir Site Location PS Hydropower Project near Patrak Village (towards upstream of weir location)

2.8.3 Headrace Tunnel

About 5 km long underground tunnel will be built to divert the water from the outlet bay of sand trap structure to the surge shaft location. The tunnel width and height will be 4.5 m.

2.8.4 Powerhouse

A powerhouse will be built on the right bank of the Panjkora River near the Patrak village, and the tentative location of the powerhouse is shown in **Figure 2.9**.

Figure 2.9: Proposed Powerhouse Location PS Hydropower Project near Shringal Village (towards downstream of powerhouse location)

2.8.5 Transmission Line

The proposed transmission line to be built for the KBP hydropower project will also be used for the PS hydropower project. However, the line from KBP to the PS switchyard site (10 km) will be of a single circuit, and the line from PS to the Dir Grid station (26 km) will be of the double circuit.

2.8.6 Project Colony and Construction Camp

A project colony will be built for PEDO staff (about 20 families) with an adequate drinking water supply and sanitation facilities. The labor requirement during the construction stage is about 400, in which about 100 will be outside works (50 will be foreigners and 50 will be from Pakistan), and the remaining 300 will be local laborers. A construction camp will be built for 100 workers with necessary drinking water and sanitation facilities.

2.9 Cost and Implementation Period

The total cost of the Program is US$ 673 million, and the construction period each subproject is four years.

3 Legal, Regulatory and Administrative Framework

This chapter provides an overview of the national and provincial legislation and the World Bank safeguard policies that are relevant to the environmental and social assessment of the proposed Program and actions to be taken up by PEDO to meet these requirements.

3.1 Applicable Government Regulations

3.1.1 Pakistan Environmental Protection Act, 1997

The Pakistan Environmental Protection Act, 1997, is the basic legislative tool empowering the government to frame regulations for the protection of the environment. The act is applicable to a broad range of issues and extends to air, water, industrial liquid effluent, soil, marine, and noise pollution, as well as to the handling of hazardous wastes. As defined in the Act "environment" means: “(a) air, water and land; (b) all layers of the atmosphere; (c) all organic and inorganic matter and living organisms; (d) the ecosystem and ecological relationships; (e) buildings, structures, roads, facilities and works; (f) all social and economic conditions affecting community life; and (g) the inter-relationships between any of the factors in sub-clauses (a) to (f).

3.1.2 KP Environmental Protection Act

The KP Environmental Protection Act of 2014 is the provincial version of the Pakistan Environmental Protection Act, 1997 (PEPA) relevant to the Project. Responsibility for PEPA was transferred from the Ministry of Environment to the provincial governments by an amendment to the PEPA in 2012. The provincial versions continue to remain materially the same as the PEPA except where governmental bodies are referred.

The following are key features of the provincial Acts:

- Section 11 (Prohibition of Certain Discharges or Emissions) states that “Subject to the provisions of this Act and the rules and regulations made thereunder, no person shall discharge or emit, or allow the discharge or emission of, any effluent or waste or air pollutant or noise in an amount, concentration or level which is in excess of the Environmental Quality Standards”.
- Section 13-I (Initial Environmental Examination and Environmental Impact Assessment) requires that “No proponent of a project shall commence construction or operation unless he has filed with the Federal Agency an IEE or, where the project is likely to cause an adverse environmental effect, an EIA, and has obtained from the Federal Agency approval in respect thereof.” This IEE will be submitted by WAPDA for EPA approval.
- Section 13-2b (Review of IEE and EIA): The Environmental Protection Agency shall review the EIA report and accord its approval subject to such conditions as it may deem fit to impose, or require that the EIA be re-submitted after such modifications as may be stipulated or rejected, the project as being contrary to environmental objectives.
- Section 15 (Handling of Hazardous Substances) requires that “Subject to the provisions of this Act, no person shall generate, collect, consign, transport, treat, dispose of, store, handle, or import any hazardous substance except (a) under a license issued by the EPA and in such manner as may be prescribed; or (b) in accordance with the provisions of any other law for the time being in force, or of any international treaty, convention, protocol, code, standard, agreement, or other Instrument to which Pakistan is a party.” Enforcement of this clause requires the EPA to issue regulations regarding licensing procedures and to define ‘hazardous substance.’

- Section 16 (Regulation of Motor Vehicles): Subject to provision of this clause of the Act and the rules and regulations made thereunder, no person shall operate a motor vehicle from which air pollutants or noise are being emitted in an amount, concentration or level which is in excess of the EQS, or where the applicable standards established under clause (g) of subsection (1) of Section-6 of the Act.
- Section 18 (Penalties): Whoever contravenes or fails to comply with the provisions of section 11, 12, 13, or section 16 or any order issued thereunder shall be punishable with fine which may extend to one million rupees, and in the case of a continuing contravention or failure, with an additional fine which may extend to one hundred thousand rupees for every day during which such contravention or failure continues: Provided that if contravention of the provisions of section 11 also constitutes contravention of the provisions of section 15, such contravention shall be punishable under sub-section (2) only.
- Section 19 (Offences by Bodies Corporate): Where any contravention of this Act has been committed by a body corporate, and it is proved that such offense has been committed with the consent or connivance or, is attributed to any negligence on the part of, any director, partner, manager, secretary or other officers of the body corporate, such director, partner, manager, secretary or other officers of the body corporate, shall be deemed guilty of such contravention along with the body corporate and shall be punished accordingly.

Environmental approvals will be required under this act for the proposed projects before starting the construction works and operation.

3.1.3 Pakistan Environmental Protection Agency (Review of IEE & EIA) Regulations, 2000

The IEE/EIA Regulations 2000 establish the framework for the preparation, submission, and review of the IEE and EIA. The regulations categorize development projects for IEE and EIA into two schedules (Schedules I and II). Schedule I include projects where the range of environmental issues is comparatively narrow, and the issues can be understood and managed through less extensive analysis. Schedule II covers major projects that have the potential to affect a large number of people in addition to generating potentially significant adverse environmental impacts. Preparation of a complete EIA is required for Schedule II projects. The following development projects fall under Schedule I:

- Hydroelectric power generation less than 50 MW
- Transmission lines less than 11 kV, and large distribution projects

The projects more than the above capacity will fall under Schedule II. The capacities of some of the proposed hydropower subprojects are less than 50 MW, but the transmission line capacity will be 132 kV. Hence, an EIA will be required for those projects.

3.1.4 Land Acquisition Act of 1894

The Land Acquisition Act 1894 provides for the acquisition of private properties for public purposes, including development projects in Pakistan. It comprises 55 sections dealing with area notifications, survey, acquisition, compensation, apportionment awards, disputes resolutions, penalties, and exemptions. The key clauses of the Act are summarized in Table 2.3. The land acquisition for the subprojects will be carried out in accordance with this act.

Table 3.1: Key Clauses of Land Acquisition Act

LAA Section	Description
Section 4	Publication of preliminary notification and power for conducting the survey.

LAA Section	Description
Section 5	Formal notification of land needed for a public purpose. Section 5a covering the need for enquiry of the concerns or grievances of the affected people related to land prices.
Section 6	The Government makes a more formal declaration of intent to acquire land.
Section 7	The Land Commissioner shall direct the Land Acquisition Collector (LAC) to take order the acquisition of the land.
Section 8	The LAC has then to direct that the land acquired to be physically marked out, measured and planned.
Section 9	The LAC gives notice to all project-affected persons (PAPs) that the Government intends to take possession of the land and if they have any claims for compensation then these claims are to be made to him at an appointed time.
Section 10	Delegates power to the LAC to record statements of the PAPs in the area of land to be acquired or any part thereof as co-proprietor, sub-proprietor, mortgage, and tenant or otherwise.
Section 11	Enables the Collector to make enquiries into the measurements, value, and claim and then to issue the final "award". The award includes the land's market area and the valuation of the compensation.
Section 11 A	Enables the Collector to acquire land through private negotiations upon request of Head of the acquiring department. Upon receipt of any such request, the collector is empowered to constitute/notify a committee for assessment of the market value of land and verification of title of ownership. On agreement by Head of Acquiring Department, with negotiated market value determined by the committee, the collector shall then direct parties to execute sale deed in favor of acquiring department on stamp paper.
Section 11 B	Provides a time limit of six months to complete the land acquisition process from the date of notification under Section-4.
Section 16	When the LAC has made an award under Section 11, he will then take possession and the land shall thereupon vest absolutely in the Government, free from all encumbrances.
Section 18	In case of dissatisfaction with the award, PAPs may request the LAC to refer the case onward to the court for a decision. This does not affect the Government taking possession of the land.
Section 23	The award of compensation to the title holders for acquired land is determined at i) its market value of land, ii) loss of standing crops, trees and structures, iii) any damage sustained at the time of possession, iv) injurious affect to other property (moveable or immoveable) or his earnings, v) expenses incidental to compelled relocation of the residence or business and vi diminution of the profits between the time of publication of Section 6 and the time of taking possession plus 15% premium in view of the compulsory nature of the acquisition for public purposes.
Section 28	Relates to the determination of compensation values and interest premium for land acquisition.
Section 31	Section 31 provides that the LAC can, instead of awarding cash compensation in respect of any land, make any arrangement with a person having an interest in such land, including the grant of other lands in exchange.
Section 48A (LAA-1986)	If within a period of one year from the date of publication of declaration under section 6 in respect of any land, the Collector has not made an award under section 11 in respect to such land, the owner of the land shall, unless he has been to a material extent

LAA Section	Description
	responsible for the delay be entitled to receive compensation for the damage suffered by him in consequence of the delay.

3.1.5 Telegraph Act, 1885

The Telegraph Act (1885) was enacted to define the authority and responsibility of the Telegraph Authority. The law covers, among other activities, installation, and maintenance of telegraph lines and posts (poles). The Act defines the mechanism to determine and make payment of compensation associated with the installation of these lines and posts. Under this Act, the land required for the poles is not acquired (or purchased) from the owner, nor the title of the land transferred. Compensation is paid to the owner for any structure, crop or tree that exists on the land; the cost of the land is not paid to the owner. National Transmission & Despatch Company (NTDC) is the responsible agency for developing transmission line networks in the country and it has been following this act for building transmission line towers throughout the country.

3.1.6 Factories Act, 1934 (as amended to 1997)

The clauses relevant to the project are those which concern the health, safety, and welfare of workers, disposal of solid wastes and effluents, and damage to private and public property. The Factories 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 construction contractors. Particular sections of the act applicable to the proposed subprojects are:

- Section 13(1): Every factory shall be kept clean and free from effluvia arising from any drain, privy or other nuisance.
- Section 14(1): Effective arrangements shall be made in every factory for the disposal of wastes and effluents due to the manufacturing process carried on therein.
- Section 16(1): In every factory in which, by reason of the manufacturing process carried on, there is given off any dust or fume or other impurities of such a nature and to such an extent as is likely to be injurious or offensive to the workers employed therein, effective measures shall be taken to prevent its accumulation in any work-room and its inhalation by workers and if any exhaust appliance is necessary for this purpose, it shall be applied as near as possible to the point of origin of the dust, fume or other impurities, and such point shall be enclosed so far as possible.
- Section 16(2): In any factory no stationary internal combustion engine shall be operated unless the exhaust is conducted into open air and exhaust pipes are insulated to prevent scalding and radiation heat, and no internal combustion engine shall be operated in any room unless effective measures have been taken to prevent such accumulation of fumes therefrom as are likely to be injurious to the workers employed in the work-room.
- Section 20(1): In every factory effective arrangement shall be made to provide and maintain at suitable points conveniently situated for all workers employed therein a sufficient supply of drinking water.

3.1.7 Labor Laws

Labor laws in Pakistan are governed by many legislative tools. Principal labor rights are provided by the constitution of Pakistan. In addition to constitutional rights, acts and ordinances have been enforced from time to time for limiting working hours, minimum working age, and conditions of employment.

Of the 24 labor-related laws that existed in 2014 in Pakistan, those set out in Table 3.2 relate directly to the International Labor Organization's (ILO's) core labor standards and will broadly be applicable to the proposed subprojects.

Table 3.2: Labor Laws of Pakistan

Legislation / Guidelines	Brief Description
KP Bonded Labor System (Abolition) Act (1995) and Punjab Bonded Labor System (Abolition) Act (2012)	The Bonded Labor System (Abolition) Acts seek to eradicate bonded labor practices prevailing in the respective provinces. The Acts define the `Bonded Labor System' as a system of forced or partly forced, labor under which a debtor enters or is presumed to have entered into an agreement with the creditor to the effect that: • In consideration of an advance obtained by him or by any of the members of his family (whether or not such advance is evidenced by any document) and in consideration of the interest, if any, due on such advance, or • In pursuance of any customary or social obligation, or • For any economic consideration received by him or by any member of his family.
KP/Punjab Minimum Wages for Unskilled Workers Ordinances (1969)	The ordinances state that every employer shall be responsible for the payment of minimum wages required to be paid under the ordinances to all unskilled workers employed, either directly or through a contractor, in his commercial or industrial establishment: • Provided that where an employer provides housing accommodation to a worker, he may deduct from the wages of such a worker, an amount not exceeding that in the ordinance; • Where the employer provides a worker with transport to and from the place of work, he may deduct from the wages of such a worker an amount not exceeding that specified in the ordinance.
KP/Punjab Industrial Relations Acts (2010)	These Acts seek to regulate the formation of trade unions, regulation, and improvement of relations between employers and workmen and the avoidance and settlement of any differences or disputes arising between them and ancillary matters.

Pakistan has ratified the ILO conventions for the core labor standards, including:

- Freedom of association and collective bargaining (conventions 87 and 98)
- Elimination of forced and compulsory labor (conventions 29 and 105)
- Elimination of discrimination in respect of employment and occupation (conventions 100 and 111)
- Abolition of child labor (conventions 138 and 182).
- Pakistan has also ratified the United Nations (UN) Convention on the Rights of the Child in 1990 but is not yet subscribed to the UN Convention of the Protection of the Rights of all Migrant Workers and Members of their Families.

The labor laws of Khyber Pakhtunkhwa province. The constitution of Pakistan contains a range of provisions with regard to labor rights found in Part II: Fundamental Rights and Principles of Policy:

- Article 11 of the constitution prohibits all forms of slavery, forced labor, and child labor.

- Article 17 provides for a fundamental right to exercise the freedom of association and the right to form unions.
- Article 18 prescribes the right of its citizens to enter upon any lawful profession or occupation and to conduct any lawful trade or business.
- Article 25 lays down the right to equality before the law and prohibition of discrimination on the grounds of sex alone.
- Article 37(e) makes provision for securing just and humane conditions of work, ensuring that children and women are not employed in vocations unsuited to their age or sex, and for maternity benefits for women in employment.

Pakistan's labor laws trace their origins to legislation inherited at the time of partition. The laws have evolved in response to socioeconomic conditions, shifts in governance, state of industrial development, population and labor force expansion, growth of trade unions, level of literacy, and the government's commitment to development and social welfare.

Under the constitution, labor is regarded as a 'concurrent subject,' which means that it is the responsibility of both the federal and provincial governments. However, for the sake of uniformity, laws are enacted by the federal government, stipulating that provincial governments may make rules and regulations of their own according to the conditions prevailing in or for the specific requirements of the provinces.
The labor laws are a comprehensive set of laws in Pakistan dealing with the following aspects:

- Contract of employment
- Termination of contract
- Working time and rest time (working hours, paid leaves, maternity protection and other leave entitlements).
- Minimum age and protection of young workers
- Equality
- Pay issues
- Workers' representation in the enterprise
- Trade union and employer's association regulation
- Other laws.

3.1.8 Pakistan Antiquity Act, 1975

The Pakistan Antiquity Act (1975) is applicable to the Khyber Pakhtunkhwa (KP). The current Antiquities Act 1975 (amended in 1990), redefined as 'ancient' any object that is at least 75 years old. It requires that all accidental discoveries are reported to the federal Department of Archeology. It also makes the federal government the owner of all buried antiquities discovered from any site, whether protected or otherwise. It bans all new construction within a distance of 200 feet from protected antiquities. The cultural heritage laws of Pakistan are uniformly applicable to all categories of sites regardless of their state of preservation and classification as monuments of national or world heritage. The Antiquities Act guarantees that no changes or repairs can be made to a protected monument even if it is owned privately without approval of the official agencies concerned with it.

3.1.9 Khyber Pakhtunkhwa Antiquities Act, 2016

KP has promulgated an act to protect, preserve, develop and maintain antiquities in the Province. The act defines "Antiquity" as any ancient product of human activity which has been in existence for a period of not less than one hundred years.

The act covers the establishment of different bodies; antiquities and related issues; development schemes; new construction and use of movable antiquities; excavation or exploration and related matters; and other miscellaneous provisions. It bans all new construction within a distance of 200 feet from protected antiquities except with the approval of the Directorate.

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

The act is applicable to Khyber Pakhtunkhwa (KP). The act protects women against sexual harassment at the workplace. The act is composed of 13 sections elaborating definitions, composition of the inquiry committee, procedure for holding inquiry, penalties (minor and major), powers of inquiry committee, role of the employer, the process for appeal against minor and major penalties, ombudsmen and powers of the ombudsmen.

3.1.11 The Khyber Pakhtunkhwa Prohibition of Employment of Children Act, 2015

According to this Act, "child" means a person who has not completed his fourteenth year of age. The act specifies that no child shall be employed or permitted to work in any establishment.
The act also states that a child not below the age of 12 years may be engaged in the light work, alongside his family member, for a maximum of two hours per day mainly for the purpose of acquiring skills, in a private undertaking or in any school established, assisted or recognized by Government for such purpose. It is also specified that no adolescent shall be employed or permitted to work in any hazardous work included in the Schedule.
The act also stipulates the constitution of committee on child labor and covers the important aspects related to hours and period of work, weekly holidays, notice to inspector, disputes as to age, maintenance of register, and display of notice, abstract of sections and health and safety.

3.1.12 Guidelines for Public Consultation, 1997

These guidelines issued by the Pakistan Environmental Protection Agency address possible approaches to public consultation and techniques for designing an effective program of consultation that reaches all major stakeholders and ensures the incorporation of their concerns in any impact assessment study. The guidelines cover consultation, involvement and participation of stakeholders; effective public consultation (planning, stages of an Environmental Impact Assessment (EIA) where consultation is appropriate); and facilitation of involvement (including the poor, women, and NGOs).

3.1.13 Other Relevant Environmental Legislation

An overview of other relevant legislation relevant to the environmental and social aspects of the Project is presented in **Table 3.3**.

Table 3.3: Other Relevant Social and Environmental Legislation

Legislation / Guidelines	Brief Description	Relevance to the Proposed Subprojects
National Environmental Quality Standards 2012	Powers for regulating Environmental Quality Standards (EQS) transferred from the national government to the provincial governments in 2012. The EQS are materially the same as the National EQS (NEQS) that were established in 1993 and were subject to amendment in 2000, 2009, and 2010. EQS relevant to the Project include:	The proposed project will comply with these standards.

Legislation / Guidelines	Brief Description	Relevance to the Proposed Subprojects
	• Municipal and liquid industrial effluents (32 parameters) • Industrial gaseous emissions (18 parameters) • Motor vehicle exhaust and noise (used and new vehicles) • Ambient air quality (9 parameters) • Drinking water quality (32 parameters) • Noise (four zones during day and night).	
Forest Act (1927) and Forest (Amendment) Act (2010)	The Forest Act of 1927 establishes the right of GoP to designate areas of reserved forest, village forest and protected forest. GoP is enabled to acquire such areas in order to prohibit or restrict the public use of such resources or other activities within them.	It has been confirmed in consultation with the Forest Department that no such areas are present within the study area
Protection of Trees and Brushwood Act (1949)	The Protection of Trees and Brushwood Act of 1949 prohibits the cutting or lopping of trees along roads and canals planted by the Forest Department unless the prior permission of the Forest Department is obtained.	ESIAs will be prepared in consistence with this Act.
Wildlife and Biodiversity (Protection, preservation and conservation management act), 2015	The Act has been instated to consolidate the laws relating to protection, preservation, conservation and management of wildlife in KP. It places restrictions on hunting, possession and display of wildlife, trade and trafficking of wildlife or wildlife products, and protected areas. Wildlife offences and penalties for those offences are provided in the Act.	This act will apply to all the project workers
Workers Compensation Act, 2013 Minimum Wages, Act 2013	The Act provides for the regulation of minimum rates of wages and various allowances for different categories of workers employed in certain industrial and commercial undertakings and establishments.	The subprojects needs to ensure that all workers are paid at least minimum wages. If this is ensured, the Act will not affect the Project.
Rivers Protection Ordinance 2002	The ordinance has been instated to provide for the protection of aquatic ecology, water quality, economic and environmental value of rivers and their tributaries in KP. The ordinance has been instated keeping in view the increasing developments along rivers in KP and the need to maintain the quality of the rivers for public use. The rules set out will be applicable on any length of a particular river or stream or any part of a river or its tributary that has been specified by the Government.	The rules laid out in the ordinance relate mainly to encroachment onto the river and pollution of the river. It is important that Project-related activities do not pollute the river and that all construction activities along the river banks be carried out within the area designated for them.
Right to Information Act, 2013	The Act provides for ensuring transparency and access to information in KP.	Information of proposed projects will be shared on PEDO's website
Motor Vehicle Ordinance (1965) and Rules (1969)	The ordinance deals with the licensing requirement for driving; powers of licensing authority, Regional Transport Authority and those of Court vis-à-vis disqualification for	The contractor will have to comply with these Rules.

Legislation / Guidelines	Brief Description	Relevance to the Proposed Subprojects
	license and registration requirements to control road transport; compensations for the death of or injury to a passenger of public carrier; powers of Road Transport Corporation; traffic rules, power to limit speed, weight, use of vehicles; power to erect traffic signs; specific duties of drivers in case of accident and powers of police officers to check and penalize traffic offenders.	
Highway Safety Ordinance (2000)	This Ordinance includes provisions for licensing and registration of vehicles and construction equipment; maintenance of road vehicles; traffic control offenses, 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.	The contractor will have to comply with this Ordinance.
Pakistan Penal Code (1860)	The Pakistan Penal Code deals with offences where public or private property and/or human lives are affected due to the intentional or accidental misconduct of an individual or body of people. In the context of the environment, the Penal Code empowers local authorities to control noise, toxic emissions and disposal of effluents.	The contractor will have to comply with this Code.
Pakistan Explosives Act (1894)	The Pakistan Explosive Act of 1884 provides regulations for the handling, transportation and use of explosives during quarrying, blasting and other purposes. The quarrying of stone for rip rap or concrete aggregates may need blasting at the quarry site. In this event these regulations will be applicable for this project.	The contractor will have to comply with this Act.
Regulation of Mines and Oil Fields/ Mineral Development Act (1948)	This legislation provides regulatory procedures for the quarrying and mining of construction material on the public as well as private lands.	The contractor will have to comply with this Act.

3.1.14 Legislation Related to Gender-Based Violence

Legal and Policy Framework of GoP/KP. Article 25 of the Constitution of the Islamic Republic of Pakistan, while guaranteeing gender equality, empowers the State to make special provisions for the protection of women. This includes protection of the right to life, liberty, economic empowerment, and education. The GBV is covered under the legal framework of GoKP to protect women against harassment in the workplace. The Khyber Pakhtunkhwa Harassment of Women in the Workplace (Amendment) Act, 2017 requires a number of actions to protect women against harassment in the workplace. As a result, the GoKP appointed a woman as the provincial Women's Ombudsperson for receiving and disposing of complaints of working women against harassment in their respective places of employment. The Government of Khyber Pakhtunkhwa has also established a Commission on the Status of Women under the Khyber Pakhtunkhwa Commission on the Status of Women Act (2016). Moreover, a provincial Women's Empowerment Policy was launched in 2015 in pursuance of the province's commitment to

gender equality. The Government of Khyber Pakhtunkhwa is committed to further improve the situation of women's rights and formulated a KP Human Rights Policy 2018, which also provides recommendations on violence against women and children. PEDO, being a part of GoKP, will comply with the Khyber Pakhtunkhwa Harassment of Women in the Workplace (Amendment) Act, 2017 of GoKP. The PEDO was instructed through a formal letter by Energy & Power Department dated 28-08-2017 on Implementation of "Protection Against Harassment of Women at Workplace Act 2010". The PEDO established requisite "Inquiry Committee" through Office Order No. 5958 dated 21/09/2017.

International Commitments Signed by Pakistan. The Government of Pakistan has ratified various international human rights instruments, committed to securing equal rights for women including, the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) and International Labor Organization (ILO) Conventions No. C-100 (Equal Remuneration Convention) and C-111 Discrimination (Employment and Occupation). CEDAW obliges member States, to eliminate all forms of discrimination against women and bring de-jure and de facto equality between men and women. It also obliges States to take all legislative, administrative and other measures to ensure women's participation in economic, political and national life. In addition to CEDAW, ILO Convention No. 100 and No. 111 provide for equality of opportunity and treatment in all employment-related matters including remuneration.

3.2 Environmental Approval Requirements of the Proposed Subprojects

According to EIA/IEE regulations of 2010, the projects with hydroelectric power generation less than 50 MW and transmission lines less than 11 kV fall under Schedule 1 and require submission of IEE for environmental clearance from KP EPA. The projects more than these capacities will fall under Schedule II. The KP EIA approval process is illustrated in **Figure 3.1**.

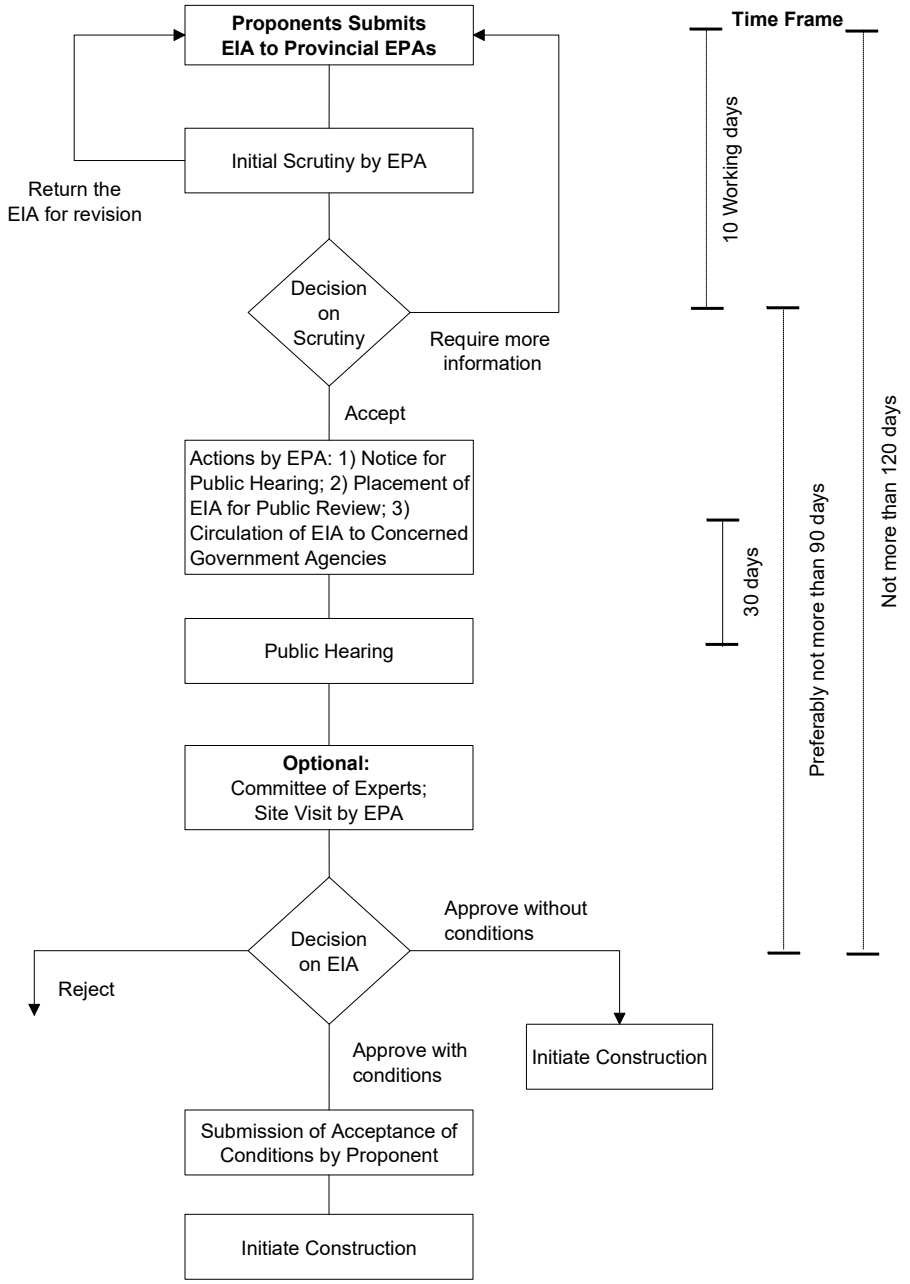

Figure 3.1: EIA Review and Approval Process

3.3 Environmental Regulatory Authorities

Since the project area falls in KP province, the KP Environmental Protection Agency (EPA) is the relevant environmental regulatory authority. The provincial EPAs are responsible for environmental regulation and implementing GoP environmental policies in their respective provinces. As part of their roles, provincial EPAs are responsible for reviewing EIA documentation for compliance with provincial EIA requirements and procedures and, using their district-based staff, also monitors the implementation of EMPs.

Statutory functions of the provincial EPAs are to:

- Administer and implement the Environmental Protection Act, its rules and regulations
- Review IEE/EIA, preparation of procedures and guidelines
- Prepare, revise and enforce EQS (industries, municipalities, vehicular emission)
- Establish and maintain laboratories, certification of laboratories for conducting tests and analysis
- Assist local Councils, Authorities and / or Government Agencies in the execution of projects
- Establish a system of surveys, monitoring, examination, and inspection to combat pollution
- Conduct training for Government functionaries and industrial management
- Provide information and education to the public on environmental issues
- Publish the Annual State of the Environment report
- Undertake surveys and qualitative and quantitative analysis of data on air, soil and water quality, and industrial, municipal and traffic emissions
- Take measures to promote environment-related Research and Development (R&D) activities.

Other key relevant departments in the province and their roles are summarized below.

- Forest
    - Preparation and implementation of policies and programs in the forestry sector.
    - Implementation of Forestry Laws and rules.
    - Protection, conservation, development, and management of renewable natural resources, particularly forests and rangelands in the province.
    - Sustainable management of forest for production of timber, firewood and other non-timber produce and services.
    - Demarcation and protection of Forest land against encroachment.
    - Raising of nurseries and plantations.
    - Provide extension services for mass awareness and conduct research and training for capacity building.
    - The Forest Department will be involved in case of the need to fell any trees in the government forests.
- Wildlife
    - Protection, conservation, preservation, and management of wildlife.
    - Management of protected areas, wildlife parks, safaris, and zoos.
    - Public and private participation through trophy hunting, private breeding farms and hunting associations.
    - As such no protected areas fall within or adjacent to the study area of the ESIA however contractor and its staff will have to comply with the relevant wildlife protection legislation.
- Fisheries
    - Extension services/fish farming/aquaculture development.
    - Conservation, management and development of natural resources.
    - Production of fish seed under controlled conditions.
    - Research and training activities.
    - Introduction of new technologies for enhancing fish production.
    - The Fisheries Department will be involved in case of any damage to any fish resources and fishponds caused by the project activities.
- Revenue Department

- The revenue department is responsible for the acquisition of land (permanent or temporary) including assessment, valuation, disbursement of compensation, and mutation in favor of NTDC.

- Agriculture Department
  - In case of an impact on crops and fruit trees, the Agriculture Department is fully responsible for the assessment and valuation of losses.
- Communication & Works (C&W) Department
  - The C&W will be involved in the assessment and valuation of losses in case of project impact on structures/ buildings and roads.

3.4 International Treaties Signed by Pakistan

Pakistan is a signatory to a number of international environment-related treaties, conventions, declarations, and protocols. The following are the relevant international treaties and conventions to which

- Convention on the Conservation of Migratory Species of Wild Animals
- Convention on the Control of Trans-Boundary Movements of Hazardous Wastes and their Disposal
- Convention concerning the Protection of World Culture and Natural Heritage
- Convention on the International Trade in Endangered Species
- International plant protection convention
- International Covenant on Economic, Social and Cultural Rights
- International Labor Organization's (ILO) Core Labor Standards on:
- Freedom of association (convention 87)
- Elimination of forced and compulsory labor (conventions 29 and 105)
- Elimination of discrimination in respect of employment and occupation (conventions 100 & 111)
- Abolition of child labor (conventions 138 and 182)
- Kyoto Protocol to the Convention United Nations Framework on Climate Change
- Stockholm Convention on Persistent Organic Pollutants
- United Nations Convention on Biological Diversity
- United Nations Convention on the Rights of the Child
- United Nations Framework Convention on Climate Change.

3.5 World Bank Safeguard Policies and Guidelines

The World Bank has developed a number of Safeguard Policies to ensure that all possible impacts are considered, and mitigation measures are spelled out prior to the implementation of any proposed project. These policies ensure that the quality of operations is uniform across different settings worldwide. If the decision is taken that a Safeguard Policy should be applied, mitigation measures and plans must be developed and in place before the implementation of a proposed project.

The Bank requires environmental screening and classification for all investment projects proposed for Bank financing, to help ensure that they are environmentally and socially sound and sustainable. Screening and classification take into account the natural environment (air, water, and land); human health and safety; social aspects (including especially involuntary resettlement and presence of Indigenous Peoples); cultural property; and trans-boundary and global environmental aspects.

The objectives of environmental screening and classification are to evaluate the environmental risks associated with a proposed operation; to determine the depth and breadth of Environmental Assessment (EA); and to recommend an appropriate choice of EA instrument(s) suitable for a given project. The Bank

recognizes that environmental screening and classification is not absolute and involves professional judgment on a case by case basis. When screening, careful consideration needs to be given to potential environmental impacts and risks associated with the proposed project. Judgment is exercised with reference to the policy expectations and guidance; real impacts on the ground; and established regional and Bank-wide precedence and good practice.

The applicable WB safeguard policies are described below**. Table 2.2** provides details of how each policy applies to the proposed investments under the Project.

3.5.1 Environmental Assessment (OP/BP 4.01)

EA requirement. The World Bank requires environmental assessment (EA) of projects proposed for Bank support to ensure that they are environmentally sound and sustainable, and thus to improve decision making. The Bank Policy OP/BP 4.01 considers that EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. EA takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples and physical cultural resources); and trans-boundary and global environmental aspects. The Bank Policy also envisages that the borrower Government is responsible for carrying out the EA and the Bank advises the borrower on the Bank's EA requirements.

The present ESMF has been prepared in compliance with this OP/BP.

EA classification. The World Bank classifies the proposed project into one of the four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. These categories are defined below.

- Category A: A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works.
- Category B: A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas--including wetlands, forests, grasslands, and other natural habitats--are less adverse than those of Category A projects.
- Category C: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.
- Category FI: A proposed project is classified as Category FI if it involves the investment of Bank funds through a financial intermediary (FI), in subprojects that may result in adverse environmental impacts.

3.5.2 Natural Habitats (OP 4.04)

The Policy highlights the importance of conservation of natural habitats, like other measures that protect and enhance the environment, for long-term sustainable development. The Bank therefore supports the protection, maintenance, and rehabilitation of natural habitats and their functions in its economic and sector work, project financing, and policy dialogue. The Bank also supports and expects borrowers to apply a precautionary approach to natural resource management to ensure opportunities for environmentally

sustainable development. The Bank- promotes and supports natural habitat conservation and improved land use by financing projects designed to integrate into national and regional development the conservation of natural habitats and the maintenance of ecological functions. Furthermore, the Bank promotes the rehabilitation of degraded natural habitats. The Bank does not support projects that involve the significant conversion or degradation of critical natural habitats.

3.5.3 Physical Cultural Resources (OP 4.11)

This policy addresses physical cultural resources, which are defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings and may be above or below ground, or underwater. Their cultural interest may be at the local, provincial or national level, or within the international community.

The Bank assists countries to avoid or mitigate adverse impacts on physical cultural resources from development projects that it finances. The impacts on physical cultural resources resulting from project activities, including mitigating measures, may not contravene either the borrower's national legislation or its obligations under relevant international environmental treaties and agreements.

3.5.4 Forests (OP/BP 4.36)

This Policy recognizes the need to reduce deforestation and promote sustainable forest conservation and management in reducing poverty. The Bank believes that forests are very much essential for poverty reduction and sustainable development irrespective of their location in the world. The Bank assists borrowers with forest restoration activities that maintain or enhance biodiversity and ecosystem functionality. The Bank also assists borrowers with the establishment and sustainable management of environmentally appropriate, socially beneficial, and economically viable forest plantations to help meet growing demands for forest goods and services. The Bank does not finance projects that, in its opinion, would involve significant conversion or degradation of critical forest areas or related critical natural habitats. Furthermore, the Bank does not finance projects that contravene applicable international environmental agreements.

3.5.5 Projects on International Waterways (OP 7.50)

Projects on international waterways may affect the relations between the World Bank and its borrowers, and between riparian states. Therefore, the Bank attaches great importance to the riparian making appropriate agreements or arrangements for the entire waterway, or parts thereof, and stands ready to assist in this regard. A borrower must notify other riparian of planned projects that could affect water quality or quantity, sufficiently far in advance to allow them to review the plans and raise any concerns or objections.

3.5.6 Involuntary Resettlement (OP/BP 4.12)

The WB's experience indicates that involuntary resettlement under development projects, if unmitigated, often gives rise to severe economic, social, and environmental risks: production systems are dismantled; people face impoverishment when their productive assets or income sources are lost; people are relocated to environments where their productive skills may be less applicable and the competition for resources greater; community institutions and social networks are weakened; kin groups are dispersed; and cultural identity, traditional authority, and the potential for mutual help are diminished or lost. This policy includes safeguards to address and mitigate these impoverishment risks.

The overall objectives of the Policy are given below.

- Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.
- Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.
- Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

3.5.7 Projects in Disputed Areas (OP 7.60)

Projects in disputed areas may raise a number of delicate problems affecting relations not only between the Bank and its member countries but also between the borrower and one or more neighboring countries. In order not to prejudice the position of either the Bank or the countries concerned, any dispute over an area in which a proposed project is located is dealt with at the earliest possible stage.

The Bank may proceed with a project in a disputed area if the governments concerned agree that, pending the settlement of the dispute, the project proposed for country A should go forward without prejudice to the claims of country B.

3.5.8 Safety of Dams (OP 4.37)

When the Bank finances a project that includes the construction of a new dam,3 it requires that the dam be designed, and its construction supervised by experienced and competent professionals. It also requires that the borrower4 adopt and implement certain dam safety measures for the design, bid tendering, construction, operation, and maintenance of the dam and associated works.

For large dams (dams of more than 15 m height), the Bank requires

a) reviews by an independent panel of experts (the Panel) of the investigation, design, and construction of the dam and the start of operations;

b) preparation and implementation of detailed plans: a plan for construction supervision and quality assurance, and instrumentation plan, an operation, and maintenance plan, and an emergency preparedness plan;

c) prequalification of bidders during procurement and bid tendering, and

d) periodic safety inspections of the dam after completion.

3.5.9 Environment, Health and Safety Guidelines

The Environment, Health, and Safety (EHS) Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities or projects by existing technology at reasonable costs. In addition, there are also industry-specific EHS guidelines. The guidelines that are relevant to the

Project are: General EHS Guidelines[3] and Good Practice Note on EHS Approaches for Hydropower Projects[4].

3.5.10 Public consultation and disclosure requirements by World Bank

The Bank reaffirms its recognition and endorsement of the fundamental importance of transparency and accountability to the development process. Accordingly, it is Bank's policy to be open about its activities and to welcome and seek out opportunities to explain its work to the widest possible audience. According to 'OP 4.01: Environmental Assessment' of the World Bank, the following conditions apply to the proposed subprojects.

Consultations. For all Category A and B projects, the borrower should consult the project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental aspects and takes their views into account. The borrower should initiate such consultations as early as possible. For Category A projects, the borrower should consult these groups at least twice: (a) shortly after environmental screening and before the terms of reference for the EA are finalized; and (b) once a draft EA report is prepared. In addition, the borrower should consult with such groups throughout project implementation as necessary to address EA-related issues that affect them.

Disclosure. For a Category A project, the borrower should provide relevant information on project interventions in a timely manner prior to consultation and in a form and language that is understandable and accessible to the groups being consulted. The borrower should provide a summary of the proposed project's objectives, description, and potential impacts for the initial consultation. For consultation after the draft EA report is prepared, the borrower should provide a summary of the EA's conclusions. In addition, for a Category A project, the borrower makes the draft EA report available at a public place accessible to project-affected groups and local NGOs. The borrower also ensures that EA reports for Category A subprojects are made available in a public place accessible to affected groups and local NGOs. The document needs to be translated into Bengali. Public availability of the EA report for Category A project in the borrowing country and official receipt by the Bank are prerequisites to Bank appraisal of these projects.

3.5.11 Applicable World Bank Policies to the Project

The applicable World Bank policies for the proposed investments under the Project are given in **Table 3.4**.

Table 3.4: Applicable World Bank Policies for the Project

OP/BP	Triggered	Proposed Actions to be taken up by PEDO
Environmental Assessment (OP4.01/BP4.01)	Yes	PEDO has prepared this ESMF and RPF for the proposed Program since the exact locations of proposed facilities are not yet known. The proposed projects are likely to be classified into Category A. PEDO will prepare ESIAs and A/RAPs for the subprojects during preparatory phases while carrying out the feasibility studies through independent consultants (who are not part of the feasibility study team). The documents will be submitted for World Bank clearance prior to starting of any construction activities.

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

[4] https://www.ifc.org/wps/wcm/connect/79ad4356-6f18-4955-bf35-adcd6d072897/GPN_EHSHydropower.pdf?MOD=AJPERES&CVID=mR5BwAV

OP/BP	Triggered	Proposed Actions to be taken up by PEDO
Natural habitats (OP4.04/BP4.04)	Yes	PEDO will carry out a detailed ecological assessment of the project area during the proposed ESIA studies. PEDO will design the proposed subprojects to ensure there will be no hindrance to the fish migration by building fish ladders and no degradation of aquatic ecology by releasing adequate environmental flows. The subprojects will also be designed to ensure that there will be no impact on the wildlife protected areas.
Pest Management (OP4.09)	No	Not relevant since the Program will not undertake any related activity such as purchase and or usage of agro-chemicals. Chemicals and pesticides are not used by transmission line companies to clear vegetation under the transmission lines.
Physical Cultural Resources (OP4.11)	Yes	There are no PCRs identified during the initial screening, except a few mosques and graveyards. However, these aspects will be studied in detail during proposed ESIA studies. Further, PEDO will include chance-find procedures in the contract documents.
Involuntary Settlement (OP4.12)	Yes	PEDO will prepare A/RAPs for the proposed projects in accordance with the RPF and carry out land acquisition in accordance with the approved RAPs.
Forests (OP4.36)	Yes	There could be a limited impact on the forests due to land clearing from the construction activities. PEDO will develop necessary mitigation measures in compliance with this policy.
Indigenous Peoples (OP 4.10)	No	No indigenous people as defined in the Policy are known to exist in the Program area.
Safety of Dams (OP 4.37)	Yes	PEDO will appoint an independent panel of experts to review the project designs. PEDO will monitor the dam safety during the operation.
Projects on International Waterways	Yes	The proposed subprojects are located on the Swat River basin. The Swat river originates and flow through Pakistan only and joins the Kabul River within Pakistan.
Consultations and Disclosure	Yes	PEDO has consulted with various stakeholders, including the affected communities during the preparation of the ESMF and RPF. The ESMF and RPF (including translated versions of the executive summaries) will be disclosed on the PEDO website and will be sent to World Bank for the disclosure on its external website.

4 Baseline Environment

An overview of the existing baseline information, for the identified subprojects, obtained from the secondary literature review is presented in this chapter. Detailed baseline environment of the Project area (covering biophysical and socio-economic environment) will be collected and presented in the subproject ESIAs.

4.1 Influence Area

The influence area of Gabral-Kalam hydropower project comprises about 11 km-long valley of the Gabral River, from Kanai village (one km upstream of the weir site to cover the reservoir area) to Kalam town (10 km downstream of the weir site, where it joins the Ushu River to form the Swat River). It covers all areas that are likely to be directly (by the footprints of all the proposed project facilities, river diversion from the weir site to tailrace, and transmission line) or indirectly (temporary facilities such as quarry areas, construction camps and disposal areas, and access routes) affected by the proposed construction and operational activities.

The influence area of KBP and SP hydropower projects comprises the 25-km long valley of the Panjkora river from the Kalkot village to the Shringal village. It covers all the areas that will be built under the proposed subprojects, including temporary facilities. In addition, the project influence area also covers a 1-km corridor along the proposed 26-km long 132 kV transmission line between Shringal to the existing Dir grid station.

4.2 Physical Environment

4.2.1 Physiography

The Gabral-Kalam Project is located in mountainous terrain with elevations ranging from 1974 to 2142 meters above mean sea level (amsl) along the Gabral River, while the elevations of the mountains ranging from 3700 to 4300m amsl. The valley at the weir site is narrow (about 50m) but gradually widens down to the Kalam town, where it is about 300m. Bhan Khwar (or Anakar Khwar) is a major tributary of the Gabral river in the project influence area, which joins the Gabral at 4 km downstream of the proposed weir location. Riverbed and the eroded river banks are generally covered with boulders and gravels. The valleys along the riverbanks are extensively used for agricultural uses, and the mountains are covered with the forests.

The other two hydropower project areas are also located in mountainous terrain with elevations ranging from 1460 to 1760m amsl along the Panjkora river, while the elevations of the mountains ranging from 2600 to 4000m amsl. The valley near the Kalkot (at the weir site at KBP) is wide (about 200 m), which gradually narrows down to the Patrak (at the weir site of PS), where it about 50 m. Two tributaries, Sisan Khwar and Dora Khwar, join the Panjkora in the project influence area. Riverbeds and eroded river banks are generally covered with boulders and gravels.

The river Gabral and Panjkora and also its tributaries, have steep and abruptly rising slopes on banks in the majority of their lengths, thus excluding the river flanks from any cultivable land use. There are, however, some exceptions where river flanks have fair width and gentle slopes. These areas receive a good amount of water through springs, which are being used for reasonably intensive agriculture. Riverbank erosion from the high sediment flows during floods is noticed along both the rivers.

4.2.2 Climate

The summers in the project area are very warm, and the winters are freezing. A steep rise of temperature occurs from May to June (average monthly temperature 20 °C), and then very hot during July to the end of August (average 26 °C), but during September, the temperature starts to decline (average 19 °C). A rapid fall of temperature occurs from October (16 °C) onwards. The coldest months are December and January (-2 to 11 °C in Kalam and 4 to 6 °C in Dir). The minimum temperature recorded is -11 °C in Kalam -2.5 °C in Dir in January, while the maximum temperature recorded is 32.4 °C in June.

The average annual precipitation is about 1076 mm (with a range of 878 to 1388 mm) in Kalam and 1400 mm (with a range of 717 and 1710 mm in Dir), which occurs both as rainfall during summer (July and August) and snowfall (December to February). Towards the end of cold weather, there are occasional thunderstorms and hailstorms. The mean monthly precipitation pattern at Kalam and Dir is presented in **Figure 4.1** and **Figure 4.2**, respectively. The maximum daily precipitation recorded during the historical period is 187 mm in 2010.

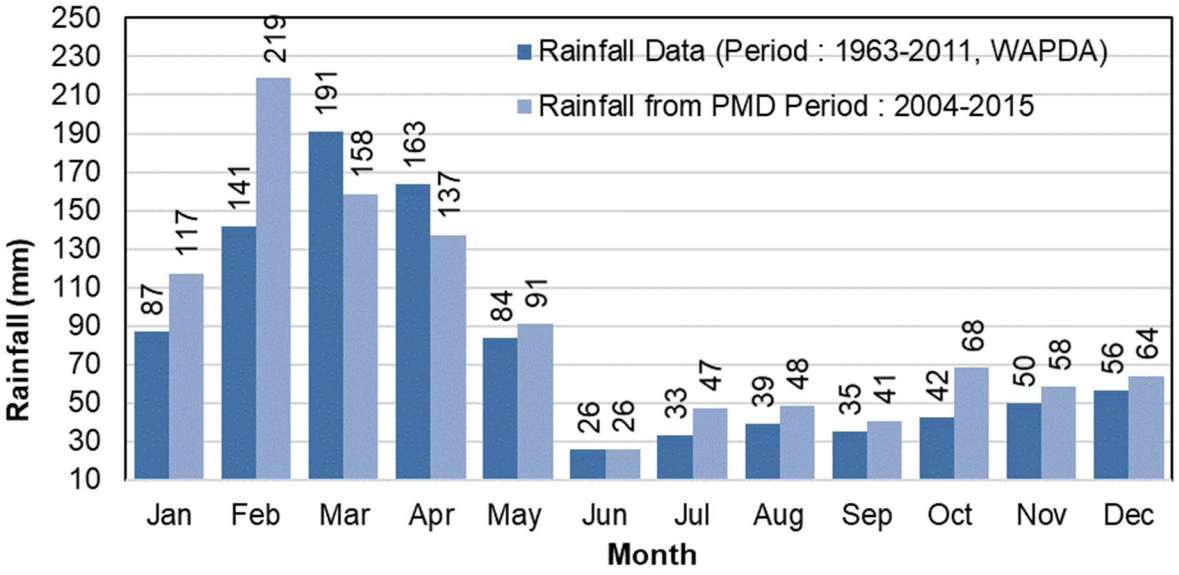

Figure 4.1: Mean Monthly Precipitation Pattern at Kalam

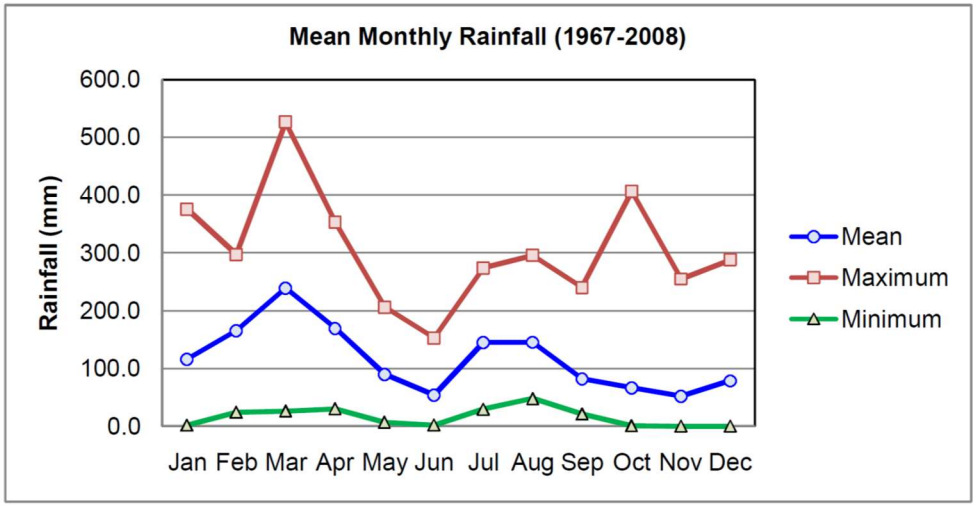

Figure 4.2: Mean Monthly Precipitation Pattern at Dir

4.2.3 Hydrology

The proposed subprojects are located on the Gabral and Panjkora Rivers, which are the main tributaries of Swat River, which in turn is a main tributary of the Kabul River. The average river flows (10-day average) of Gabral (weir site of GK) varies from 7.9 m^3/s in February to 109.5 m^3/s in June. Average monthly river discharges (10-day average) at Gabral are presented in **Figure 4.3**. The maximum instantaneous discharges of the Gabral River during the floods vary from 77 m^3/s (in 2001) to 235 m^3/s (in 2013).

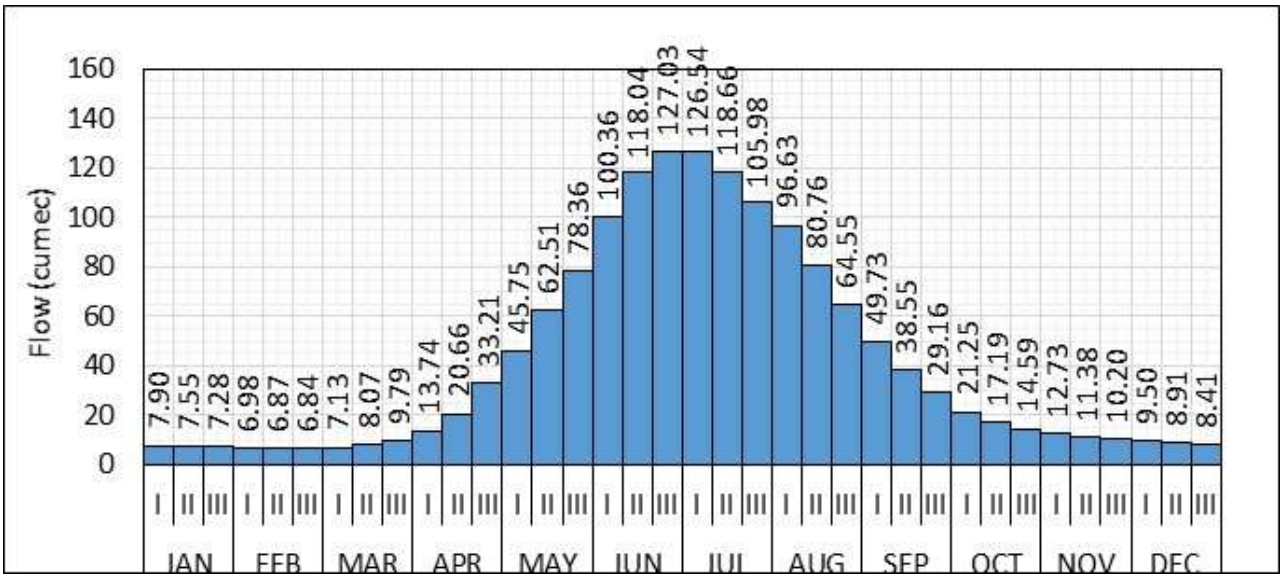

Figure 4.3: Mean Monthly River Discharges at Gabral

The mean monthly river flows at Kalkot (weir site of KBP) varies from 5.26 m^3/s in January to 48.07 m^3/s in July. About 70% of river flows occur during summer months from May to August due to the melting of snow Average monthly river discharges at the Kalkot are presented in **Figure 4.4**.

The maximum instantaneous discharges during the floods vary from 308 m^3/s (on 12 May 1999) to 4,447 m^3/s (in July 2010). The flood data was recorded at the Zhulam bridge on the Panjkora River (located about 100 km downstream of Shringal).

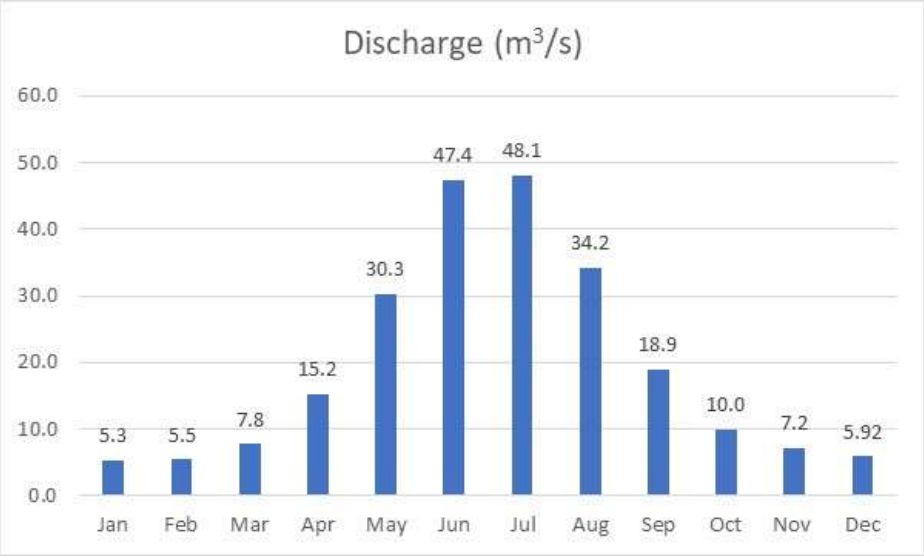

Figure 4.4: Mean Monthly River Discharges at Kalkot

The mean monthly river flows at Patrak (weir site of PS) are comparatively higher than Kalkot due to the joining of two tributaries in between Kalkot and Patrak. The mean monthly flows at Patrak vary from 9.6 m^3/s in December to 86.9 m^3/s in May. About 65% of river flows occur during summer months from May to August due to the melting of snow. The average monthly river discharges at the Patrak are presented in **Figure 4.5**.

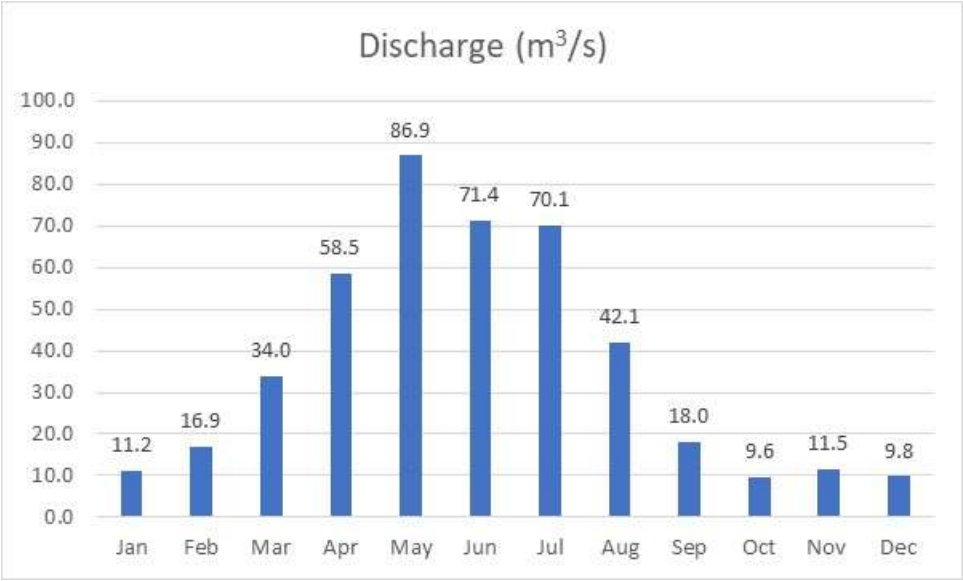

Figure 4.5: Mean Monthly River Discharges at Patrak

The river generally carries huge sediment load during the summers from the tributaries and during heavy rains. The annual sediment load at the Gabral and Kalkot site is estimated at 0.19 and 0.12 million tons, respectively.

4.2.4 Geology

The region presents the rock sequence comprised of various units of plutonic, volcanic, metamorphic nature with a variety of sediments deposited by the tributaries of the Swat River. A geological map of the region is shown in **Figure 4.6**.

The major rock unit in the project area is Utror Volcanics. This unit is further subdivided into two mappable subunits, pyroclasts and volcanic flows. Pyroclasts are generally comprised of light grey, green, maroon, and red tuff and agglomerates. Volcanic flows are comprised of grey, dark grey basaltic- andesites, andesites, rhyolites, and dacites and show poor bedding. Porphyritic textures are dominant, with less common aphyric and seriate textures. Plagioclase is the dominant phenocryst in mafic to intermediate rocks, K-feldspar and quartz phenocrysts predominate in the dacites and rhyolites. Chlorite, epidote, albite, and actinolite are the most common metamorphic phases; blue-green amphibole, andesine, muscovite, biotite, kaolinite, sericite, carbonate, and opaques are widespread but less abundant. Phase assemblages and chemistry suggest predominant greenschist facies metamorphism with epidote-amphibolite facies conditions attained locally.

4.3 Soils

The soils in the project areas are mainly derived from the Ultror Volanics and are loam and/or sandy loam, with a generally high proportion of rock fragments, while the soil texture of the alluvial plains ranges from clay loam to sandy loam. The alluvial soil is slightly alkaline, while the soil of the mountain is moderately acidic to slightly alkaline. On gentle slopes, the soil is deep and rich due to the abundance of organic matter. The richness in humus results in good porosity as well as good moisture retention.

Alluvial deposits can be divided into terraces and stream deposits, which are formed by the sedimentation of the tributaries. Terraces generally present the flood deposit and comprised of boulder, cobble, silt, and clays. Clays are fine to very fine and contain organic material. Stream deposits are comprised of gravels, cobbles, and boulders with fine to coarse sand. The deposition is an on-going process with the perennial and non-perennial streams.

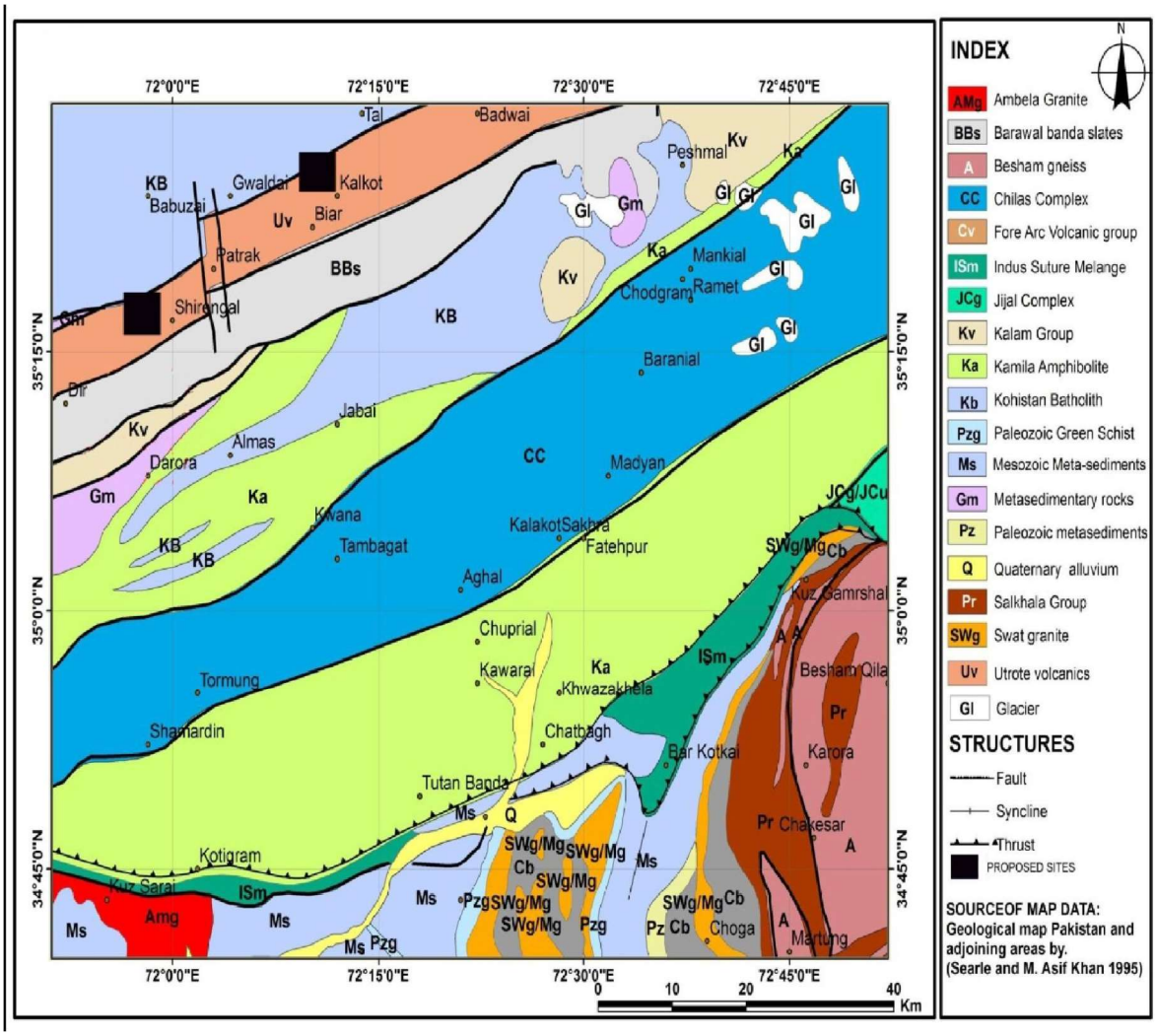

Figure 4.6: Geological Map of the Region

4.3.1 Seismicity

Geotectonic of Northern Pakistan is related to the collision of the two plates, namely Indian Plate with Eurasian plate and subsequent formation process of the Himalayan ranges. The intercontinental collision has resulted in intense deformation with complex folding involving strike-slip and thrust faulting. This tectonic process is the origin of the seismicity along the Himalayas and in particular, where Northern Pakistan is located. The major regional faults related to the intercontinental collision and considered to be active and capable of generating earthquakes, including Main Karakorum Fault (MKF), Main Mantle Thrust (MMT), Panjal Thrust, Main Boundary Thrust (MBT), Main Frontal Thrust (MFT) and Salt Range Thrust. The proposed project sites are located about 100 km away from MMT.

According to the Tectonic Map of Pakistan (**Figure 4.7**), the project sites are located in a highly seismically active area affected by the continuing northward drifting of the Indian plate and its subduction below the southern flank of the Eurasian plate. The collision of the two plates began about 50 million years ago, and the full contact between them was completed about 40 million years ago. Yet the Indian plate keeps on slowly drifting northward.

The most recent major earthquake in the area occurred on 8 October 2005, whose epicenter was near Ghori about 19 Km NE of Muzaffarabad. The minimum moment magnitude (Mw) of the earthquake measured by the United States Geological Survey (USGS) was 7.6, and the hypocenter was located at a depth of 26 Km below the ground surface. The earthquake caused severe destruction in large areas of northern Pakistan and to a lesser degree, in northern Afghanistan and northern India.

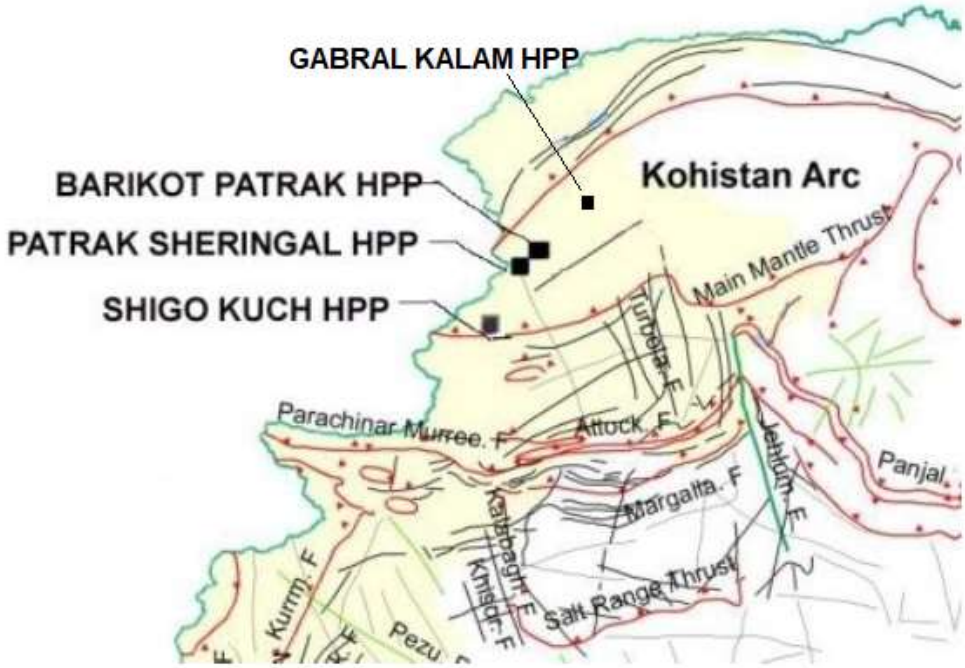

Figure 4.7: Tectonic Map of Northern Pakistan

According to the seismic hazard assessment carried out by PEDO, the recorded peak ground acceleration in the project area varies from 0.08 to 0.2 g, and the proposed hydropower facilities should be designed for an operational basis earthquake value of 0.11 to 0.37 g. A detailed seismic assessment for the proposed subprojects will be carried out during the feasibility study.

4.3.2 Surface Water, Air, and Noise Quality

The surface water quality is generally good, with no sources of pollution around the project area. The water quality studies carried out PEDO, it was observed that total dissolved solids of the Panjkora river near Patrak are 44 mg/L, and the chloride concentration is 14 mg/L. Total dissolved solids of the Gabral river near the weir site are 61 mg/L, and the chloride concentration is 6 mg/L. There are many springs in the project area, which are being used for drinking and irrigation purposes by the local communities.

Ambient air and noise quality concentrations are generally good and are well below the national standards as the project sites are located in remote rural villages with less exposure to vehicular traffic and industrial pollution. Air and noise quality was measured during the ESIA study of Gabral-Kalam hydropower project. The particulate matter concentrations (PM_{10}) in the Kalam area varies from 30 to 35 $\mu g/m^3$ (the national standard is 150 $\mu g/m^3$). The average daytime noise levels in the Kalam area varies from 40 to 50 dBA (the national standard is 65 dBA).

4.4 Biological Environment

4.4.1 Ecological Screening of the Project Area

An ecological screening exercise is carried out to identify the key biodiversity areas and protected areas around the project sites using an Integrated Biodiversity Assessment Tool (IBAT) developed by the International Union o for Conservation of Nature (IUCN) and its partners.

The Bhan Valley Game Reserve (a community game reserve) is located close to the GK hydropower project area. The Parit Gol and Ghina Gol Game Reserve (in Chitral District), which is located about 20 km from the Patrak, is the nearest protected area for KBP and SP hydropower projects. These are Alpine Meadow and Dry Temperature Forests, and the key wildlife species present in the game reserve include Markhor, Snow leopard, Chakor partridge, and Ram Chakor. The proposed project activities are not likely to have any impact on these game reserves, though further investigations will be carried out during the subproject ESIAs.

The list of threatened species that can be found within the 50 km of the project area is presented in **Table 4.1**. These include two critically endangered birds (White-rumped vulture and Sociable lapwing), two endangered mammals (Woolly flying squirrel, and Kashmir musk deer), four endangered birds (Pallas's fish-eagle, Saker falcon, Egyptian vulture, and White-headed duck) and one endangered fish species (golden mahseer).

Table 4.1: Threatened Species within 50 Km of the Project area

	Species name	Common name	IUCN Category
A	**Mammals**		
1	Eupetaurus cinereus	Woolly flying squirrel	EN
2	Moschus cupreus	Kashmir musk deer	EN
3	Panthera pardus	Leopard	VU
4	Panthera uncia	Snow leopard	VU
5	Ursus thibetanus	Asiatic black bear	VU
B	**Birds**		
1	Gyps bengalensis	White-rumped vulture	CR
2	Vanellus gregarius	Sociable lapwing	CR
3	Haliaeetus leucoryphus	Pallas's fish-eagle	EN
4	Falco cherrug	Saker falcon	EN
5	Neophron percnopterus	Egyptian vulture	EN
6	Aquila heliaca	Eastern imperial eagle	VU
7	Aquila rapax	Tawny eagle	VU
8	Aythya ferina	Common pochard	VU
9	Clanga clanga	Greater spotted eagle	VU

	Species name	Common name	IUCN Category
10	Marmaronetta angustirostris	Marbled teal	VU
11	Oxyura leucocephala	White-headed duck	EN
12	Rynchops albicollis	Indian skimmer	VU
C	**Fish**		
1	Tor putitora	Mahseer	EN
D	**Plants**		
1	Anacyclus pyrethrum	Atlas daisy	VU

Source: Integrated Biodiversity Assessment Tool on http://www.ibat-alliance.org

4.4.2 Flora

The natural flora in the project area mostly consists of the forests, which play a vital role in the economy of the area as a source of supply of timber, fuelwood, forage, and grazing. Their other benefits in terms of watershed value, source of water supply for the rivers, aesthetic value, wildlife habitat, and grazing grounds are also important. The high mountain forests are largely protected forests burdened with all types of rights of extraction of timber and firewood, grass cutting and grazing for local use unless specifically disallowed in certain areas. The forests are commercially logged, and in which 60% of the sale price is the community's share and the rest 40% is received by the provincial Government.

The common forest tree species are deodar, oak, pine, and species of *polygonum*, *Saxifraga*, *Oxytropis*, and *Potentilla*. Broad-leaved species such as walnut, maple, and horse chestnut (*Aesculus indica*) are also found in this area. Walnut is an important tree of commercial value and is mostly cultivated in the fields near the population centers.

The project area is also rich in medicinal plants, and important medicinal plants found in this area include *Valeriana wallic shii, podo-phullum emodii, Saifraga spp Artemisia maritime, Viola serpens* and *Atropoa belladonna*.

4.4.3 Fauna

4.4.3.1 Terrestrial Fauna

The habitats of the common wild species in the project area are given below:

- **Dry Temperature Evergreen Oak-Deodar Habitat**. The habitat is widespread on both banks of the Panjkora River from 1,300 to 1,800m amsl with a chief cover of Quercus ilex. Cedrus deodara does occur with oak, which has been largely removed because of the nearness of the habitat to the river and habitations. Chukor, Wolf, Monkey, Red fox, and Porcupine were reported to be found in this habitat. The habitat is also favored by Markhor and Black bear in winter.
- **Dry Temperature Coniferous Habitat**. Generally occurring above the oak habitat up to 2,700m amsl elevations, the vegetation consists of Deodar, Blue pine, Chilgoza pine and Spruce with pure and mixed occurrence. Major wildlife species reported were Chukor, Koklas pheasant, Monal pheasant, Common otter, Common leopard, Black bear, Wolf, Monkey, Red fox, Flying squirrel, Musk deer, and Porcupine.
- **Sub-alpine and Alpine Habitat**. This habitat, above the coniferous forests from 2,700 m to 4,500m amsl has moderate-sized trees individually or in groups and well-developed shrub layers. The main

species are *Betula utilis, Juniperus spp, Salix spp, Rhododendron spp,* and *Sorbus spp*. The habitat extends beyond tree limit and to permanent snowfields and also includes some fairly large-sized freshwater alpine lakes. Wildlife species reported in this habitat included Snow leopard Brown bear, Black bear, Marmot, Markhor, and Ibex, Musk deer, Monal pheasant, Himalayan Snowcock and Snow partridge.

4.4.3.2 Aquatic Fauna

The aquatic habitat in the project area is characterized by cold water, gravel bed, and high discharges. Snow carps or *Schizothoracines (genera Schizothorax* and *Schizopyge*) are the major fish of cold-water streams and rivers of the project area, with the dominant species being *Schizothorax plagiostomus* (snow carp or locally known as *swati*). Snow carps are indigenous species and are widely distributed throughout the Himalayan region of Pakistan, India and Nepal. None of these species are listed in IUCN Red List. Based on the review of available literature, the habitat, spawning and migration conditions of snow carps are established and presented below.

Habitat. Snow carps thrive in the snow-fed river habitat of clear, shallow water of stony substratum with an average depth from 0.5 to 3 meters, and river flows with low to high velocities (0.5 to 1.5 m/s). The average temperature requirements are 4 to 20 ^{o}C and dissolved oxygen requirements are 8 to 12 mg/l. Snow carps are bottom feeders and mainly feed on periphytic algae and diatoms.

Migration: Snow carps are short distant migrants, and they migrate mostly within the tributaries (headwaters areas to lower elevations and to confluence areas of the major rivers such as the Swat River; and vice versa). From April to September (spring and summer, high flows), they prefer upstream headwaters habitat at higher elevations. During September to April (low flows and winter), they prefer lower elevations. The triggers for migrations are high flows, high sediment load, and low temperatures. During spring, when flows started increasing in the rivers due to the melting of snow, the fish migrate upstream from April and May (within tributaries) due to high flows and turbidity at lower elevations. During autumn, when the temperatures start to drop at higher elevations, the fish migrate downstream from September and October.

Spawning: Female fishes spawn in two seasons, one in September-October and other in March - April. Sexually matured snow carp (when they reach 18-24 cm length, at the age of 2-3 years) spawn in tributaries in clear water (along stream banks, backwater pools and near confluences of other tributaries and Indus) on gravelly/stony ground or on fine pebbles at 10-30 cm depth. Low water currents of 0.5- 1.5 m/sec, pH 7.5, the dissolved oxygen concentration of 8-12 mg/L and gravel sizes of 50-60 mm are the optimum conditions for spawning.

In addition to snow carps, the river also includes invasive fish species of brown trout and rainbow trout.

4.5 Socio-Economic and Cultural Profile

4.5.1 Demography

According to the 2017 census report, the population of Swat and Upper Dir districts are 2,309,570 and 946,421, respectively. About 70 percent of the Swat district population and 95 percent of the Upper Dir district population live in rural areas. The average population density of the Swat district is 430 260/km^2 and Upper Dir district 260/km^2. The average number of persons in each household is 7.9.

Kalam and Ashuran are the major settlements in the project area, with a population of 12,300 (1351 households) and 5100 people (676 households). Kalam is a major tourist hill station (with about 350

hotels) in the region with about 350 hotels, and about 400,000 tourists annually visit this area during the summer.

Kalkot and Patrak are the major villages in the project area of KBP and PS, with a population of 1841 (212 households) and 4394 (616 households). One of the criteria while finalizing the project facilities is to minimize the impact on these two villages.

Kohistani and Yousafzais are the main tribes of the project districts while Padina Khel and Sultan Khel are the main sections. Besides these tribes, there are other small tribes like Catani, Roghani, Wordag, Sadat (Miangan), Swati, Hunches, Tajik, Mishwani, and Gujjars. In the project area, the Kohistani tribe and its sub-sections are dominant.

Kohistani and Pashto are commonly spoken languages. Urdu is understood usually because people of the area live in Punjab and Sindh provinces to earn a livelihood.

4.5.2 Occupations

In the program area, agricultural lands are limited. In Upper Dir, 33.7 % male population has been reported as economically active, including skilled and semi-skilled agricultural and fishery workers, service workers, shop and market sales workers, plant and machine operators, technicians, forest labors and craft and related trade workers. Farming, trade and working overseas are the main sources of income for the people. A very small proportion of the population is employed in government departments. The women share the work with the men in the agriculture sector in addition to their household chores.

Most of the Upper Dir district is mountainous terrain. Agricultural land is available only on the hilly slopes and in the valleys. Farming is usually carried out with crude implements such as ploughs drawn by bullocks, which is the traditional method of plowing done by men, where women assist them. The irrigation system is also not ideal; agriculture mostly depends upon rainfall. Cropping pattern suited to the climate of Upper Dir includes maize, rice, wheat, barley, mustard, onion, and vegetables. Fruits include walnut, persimmon, apple, pears, plums, apricot, fig, loquat, and mulberry. Walnut trees are in abundance in the project area.

In Swat, with the largest share in the cropped area, maize is sown on 60,470 hectares. This is followed by wheat (59,850 hectares). The district is also famous for producing quality fruits. A variety of fruits like peaches, apple, pear, apricot, plum, persimmon, walnut, etc. are produced and marketed all over the country. Fruits and vegetables are planted on 12,470 and 8,380 hectares respectively. Rice, rapeseed and mustard, onion and canola have also significant shares in the cropped areas and are sown more than 1,000 hectares. River Swat is the main source of irrigation water for agriculture. Most of the cultivation is carried out in the southern areas of the district consisting of Mingora, Kabal, Barikot, Matta and Khawazakhela. Major portion of the cultivated land in Rabi season is allocated to wheat and maize as the major crop in Kharif season. Besides this, almost all types of vegetables are produced in the district due to its favorable climatic condition, irrigation water and fertile land. Swat is at its heart an agrarian community and agriculture accounts for roughly 50% of the economic activities of district Swat, the major source of income for much of the rural population.

Goats, sheep, and cows are common livestock reared in the program area. The animal products are utilized domestically as well as for marketing. Agricultural produce is usually utilized for domestic use because landholdings are small.

4.5.3 Social Infrastructure

The proposed project sites are accessible from both Peshawar and Islamabad. Gabral-Kalam is accessible by National Highway (N-95), while KBP and PS hydropower sites are accessible by N45. The project areas

have access to medical and educational facilities. However, the major hospitals and institutions are located in nearby district headquarters. According to the 2017 census, the Swat district includes eight hospitals (854 beds), three regional health centers (40 beds), 41 basic health units, 3 maternity hospitals, and 19 dispensaries. While the Upper district includes five hospitals (486 beds), three regional health centers (60 beds), and 32 basic health units, one maternity hospital, and 12 dispensaries.

The educational facilities in the Swat district include (according to 2017 census) include 1299 primary schools (796 for boys and 503 for girls), 129 middle schools (84 for boys and 45 for girls), 119 high schools (81 for boys and 38 for girls), 23 higher secondary schools (18 for boys and 5 for girls) and eight degree colleges (4 for male and 4 for female). The Upper Dir district include 806 primary schools (591 for boys and 215 for girls), 90 middle schools (64 for boys and 26 for girls), and 53 high schools (40 for boys and 13 for girls), 13 higher secondary schools (10 for boys and three for girls), and three degree colleges (two for male and one for female).

Animal husbandry and other related departments are available in the area and provide services to the local farmers. Loan facilities are available from the commercial banks. The marketing of produce is done easily through trucks and small vehicles.

4.5.4 Gender Roles

The Program area, like the rest of rural KP, is a male-dominated society where gender roles and responsibilities are well defined. In both Upper Dir and Swat districts societal norms are very traditional and conservative, holding strong to the popular value system deriving its basic principles from religion. The concepts of hospitality, and Purdah are predominant within local communities. The traditional division of labor is obvious; women generally manage domestic life whereas the male members of the family are responsible for earning a living and representing the family at the communal level. Only a few women have permission to go to any place without permission. Few women are able to go to health centers / friends, while the large majority (95%) cannot go to the market centers. The male population works outside for livelihood earnings while women shoulder the responsibility of household activities. Some agricultural activities are also shared by women. Women's decision-making role is confined to the domestic sphere. Women strictly observe panda (veil) and their interaction with the outsiders is not allowed.

4.5.5 Poverty, Vulnerability and Household Income

Swat and Upper Dir are one of the poorest districts in the KP. The majority of the people in the project can be considered poor due to limited livelihood opportunities. In a socio-economic survey carried out for Gabral Kalam Hydropower Project in 2019, it was observed that about 40% of the households are living on a monthly income of less than PKR 10,000.

5 Screening of Projects, Potential Impacts and Risks

This chapter presents an overview of potential activities involved during the construction and operational stages of the proposed subprojects, and the results of initial screening exercise carried out to identify typical environmental and social impacts and risks. The objective of this screening exercise has been to develop clear guidelines for the preparation of ESIAs, including ESMPs and A/RAPs, for the proposed projects. An Environmental Code of Practices (ECPs) has also been prepared to address all general construction-related environmental and social risks of the proposed subprojects and presented in **Annex 1**.

5.1 Project Screening Criteria

A screening exercise was completed for already identified three hydropower subprojects. For other subprojects that are yet to be identified, a screening exercise will be carried out once they are identified through a reconnaissance site visit. The purpose of this visit will be to initiate the environmental and social assessment of the project, to assess the baseline conditions of the area, to identify the key environmental resources and social features of the area, to identify any environmental and or social sensitivity of the area, and to determine presence of any environmental and or social hotspots in the area. A checklist **(Annex 2)** will be filled for other subprojects that are yet to be identified based upon the findings and observations of the reconnaissance visit. The screening criteria will also ensure that the proposed subprojects meet with the requirements of the Program Development Objective.

An ESIA will need to be carried out for each hydropower subproject under the Program. However, for other renewable subprojects, such as Solar PV installations, if the screening process concludes that the project is likely to have significant and or irreversible negative environmental and or social impacts, an ESIA will need to be carried out. If the screening process concludes that the project is likely to have a low to moderate level of negative impacts, an Environmental and Social Management Plan (ESMP) will be prepared prior to initiate the subproject. In case the subproject is likely to cause resettlement impacts, a RAP or ARAP will also be prepared.

5.2 Screening of Impacts Associated with Siting of Subproject Facilities

The typical environmental and social impacts and risks likely to be caused by the proposed developments due to the siting of various project facilities are given in **Table 5.1**. A detailed and project-specific impact assessment will be carried out while conducting ESIAs or preparing ESMPs of the individual projects under the proposed Program.

Table 5.1: Potential E&S Impacts and Risks due to Siting of the Subproject Facilities

Subproject Activity	Screening of E&S Impacts and Risks
Land Acquisition and Resettlement: Land acquisition will be required for the siting of the proposed project facilities such as weir, powerhouse, switchyard, colony, transmission line, access roads, solar panels, etc.	Loss of land and residences will have a significant impact on the local communities due to the limited availability of suitable land in mountainous terrain. Agriculture is the major source of livelihood for the local communities, and any loss of agricultural land will also have significant livelihood impacts on the local communities.

	The project activities will create significant employment opportunities for the local communities. The community will be benefitted due to improved local infrastructure and the facilities to be built under the local area development program
Siting of Project Facilities in the Natural Habitats: The land under the proposed project facilities will be permanently cleared.	Loss of natural habitats and forest trees due to land clearing under project footprints Conversion of riverine habitat into the lake-like habitat in the reservoir area
Changes in aquatic ecology due to construction of a weir (barrier) and diversion of water from weir to the powerhouse	The hydropower projects on the tributaries of the Swat River will have a potential to block the migratory routes. Fish ladders will be incorporated in the design of the weirs to facilitate fish migration on both upstream and downstream; and to avoid any impacts on snow carps' migration. Design of environmental flows to maintain ecological connectivity on both upstream and downstream
Solar PV panels would be installed on hydropower facilities and also in the reservoir.	The potential impacts expected from installation of floating solar panels are reduced light penetration into the water, by the obstruction of panels, which may, in turn, affect the organisms that depend on light for their existence (photosynthesis) and fish; reflection from the panels may induce thermal changes into the water; changes in the reservoir water quality due to its contact with the photovoltaic panels; and decreased evaporation. Detailed mitigation plans will be developed during the ESIA studies of respective subproject and monitoring will be carried out during their implementation.
Tourism facilities such as developing parks, viewpoints, walking tracks, etc.	The proposed tourist facilities will help to improve the tourism in the project areas. The tourist facilities in the subprojects will be designed with adequate waste collection and toilet facilities.

5.3 Screening of Potential Impacts During Construction

The typical environmental and social impacts and risks likely to be caused by the proposed construction activities are given in **Table 5.3**. A detailed and project-specific impact assessment will be carried out while conducting ESIAs or preparing ESMPs of the individual projects under the proposed Program.

Table 5.2: Potential E&S Impacts and Risks During Construction

Subproject Activity	Screening of E&S Impacts and Risks
Excavations at the weir site and underground tunnel construction	Excavation activities and tunnel construction activities will generate a huge amount of spoils (excess excavation), which needs to be properly disposed of.
Use of hazardous materials at the construction yards	Contractors will use a wide variety of hazardous materials such as fuels, chemicals, paints, batteries, etc. The storage and handling of hazardous material will have a potential risk on the air, soil and

Subproject Activity	Screening of E&S Impacts and Risks
	water resources. Improper disposal of hazardous waste will also have a significant impact on the local communities.
Kitchens from workers camps and offices (about 100 workers will live in the construction camps)	It is estimated that about 50 kg of solid waste (organic, paper and plastic, and garbage) will be generated every day at the construction camp. Most of the waste generated will be organic waste and there are no existing municipal landfill sites in the project area and improper disposal of the organic waste will have significant health impacts on the local communities and workers.
Wastewater discharges from batching plants and tunnel discharges	Wastewater discharges from batching plants and tunnel discharges are highly alkaline and if they are directly discharged to the river without any prior treatment will impact the aquatic ecology. The batching plant discharges also contain high sediment load.
Construction-related traffic in the project area and along N45	About 40 to 50 construction vehicles will be daily passing through the local roads and this may affect the local traffic. Further, air and noise pollution will be created from the increased traffic.
Quarry and borrow areas	Huge amounts of aggregates and sand will be required for construction activities. The project may need to develop a new quarry and borrow sites, which may impact both terrestrial and aquatic environment
Conversion of river diversion channels and cofferdams	Diversion of the water during construction will create a dewatered section between both the cofferdams and will have an impact on the aquatic environment in the dewatered section
Construction Camps	Inadequate facilities at the construction camps such as safe drinking water, sanitation facilities, emergency health care will impact the workers' health. Wastewater discharges from the construction camps Impacts from increased human activities on flora and fauna
Construction activities near the wildlife habitats	Disturbance to the wildlife from the construction activities (noise, vibration. Nighttime lighting, etc.)
Occupational Health and Safety	Occupational health and safety risks to the workers due to instream construction activities, underground tunnel construction activities, and working on hill slopes and heights.
Gender and Labor Related Impacts	Possible cultural conflicts between communities and workers and health impacts, including women's privacy and access, and gender-based violence Impacts from the influx of labor from the outside areas Risk of exploitation of local workers and child labor Impacts on the mobility of women

5.4 Screening of Potential Impacts During Operation and Maintenance

the typical environmental and social impacts and risks likely to be caused by the operation and maintenance (O&M) activities of the proposed projects are given in **Table 5.4**. A detailed and project-specific impact assessment will be carried out while conducting ESIAs or preparing ESMPs of the individual projects under the proposed Program.

Table 5.3: Potential E&S Impacts and Risks during Operation and Maintenance

Subproject Activity	Screening of E&S Impacts and Risks
O&M of Weir	The weir will have a barrier effect on fish migration, and indigenous snow carps cannot migrate upstream or downstream during breeding periods. During the low flow season, there will a dewatered section between the weir and the tailrace (a 10 km section for KBP and a 5-km section for PS). If there are no adequate environmental flows are released, the aquatic ecology of the dewatered section will be affected. The water uses in the dewatered section (drinking, irrigation, and fisheries) will also be affected
O&M of Colony	The colony will generate solid waste and wastewater discharges Community health and safety of the PEDO staff and family living in the colony
O&M of Powerhouse	Generation of hazardous waste such as used fuels Workers health and safety risks due to exposure to noise and vibration and electromagnetic fields
Wildlife habitats near the subproject sites	Possible impact on local wildlife due to easy access to the area, that was not accessible easily before the project.
Local Area Development	Significant positive impacts due to local area development programs (e.g. drinking water, sanitation, medical and educational facilities, etc.)
Tourism facilities near hydropower sites	Significant positive impacts on the local tourism, particularly in the Kalam area. Generation of waste

6 Environmental and Social Assessment Framework

This chapter describes the step-by-step methodology to be followed for carrying out the environmental and social assessment studies for proposed projects and the preparation of ESIAs, and implementation of the ESMPs.

6.1 The sequence of Proposed Activities

The sequence of various activities to be followed during the preparation of ESIAs of the proposed projects and their implementation are given in **Table 6.1**. Detailed guidelines for carrying out these activities are described in the subsequent sections.

Table 6.1: Sequence of Proposed Activities for E&S Framework

Step	Activity	Description of the Activity	Timing/Status	Responsibility
1	Screening (Annex 2)	Screening of the proposed subprojects to assess the ESIA requirements	After identification of the proposed subproject	PEDO will carry out screening exercise (**Annex 2**) whenever the new projects are identified. For the three hydropower projects that were already identified, PEDO has completed the screening exercise and prepared terms of reference (ToR) to carry out ESIA studies for proposed subprojects. The ToR is presented in **Annex 3** with suggested contents of ESIA in **Annex 4**.
2	E&S Considerations in Project Design & Analysis of Alternatives	Environmental and social aspects (e.g., environmental flows, fish ladders, land acquisition) shall be considered during the analysis of various project alternatives and designs	During Feasibility and ESIA studies	Design consultants and ESIA Consultants
3	ESIA Studies – Baseline Data Collection, Impact Assessment, and ESMP	Primary baseline environmental data of the project influence area (covering physical, chemical, biological and socioeconomic environment) will be collected Assessment of impacts and their significance Preparation of ESMP	During ESIA studies	Independent ESIA Consultants (to be hired by PEDO)
4	Consultations and Disclosure	Consultations with the stakeholders (including affected communities) prior to ESIA studies and after completion of draft ESIA.	During ESIA studies	Independent ESIA Consultants and PMO

Step	Activity	Description of the Activity	Timing/Status	Responsibility
		Disclosure of the ESIA and RAP (including translated summaries) on PEDO's website	After completion of ESIA	
5	Submission of ESIA and RAP for KP-EPA and WB clearance	Submission of ESIA documents along with necessary fees to KP EPA, and arranging a public hearing for KP EPA	After Completion of ESIA – Prior to construction	PMO and its Environmental Staff
6	Environmental conditions for Bidding Documents	Preparation of environmental specification for bidding documents, including preparation of BOQs and inclusion of ESMP in the bidding documents.	Prior to bidding	PMO and its Environmental Staff
7	Implementation of ESMP	Contractors will develop site-specific construction-ESMPs and will implement them Regular monitoring of compliance by the Construction supervision consultant and PMO.	During Construction	Contractor PMO E&S staff Construction Supervision Consultant

6.2 Step 1: Screening

Environmental and social screening activities will be carried out for the proposed projects by reviewing the project details and site visits. The screening matrix is given in Annex 2. A preliminary assessment of probable environmental and social impacts and risk during various stages of project development has already been discussed in **Chapter 5**.

The outcome of the screening exercise whether the proposed subprojects would need detailed ESIAs or simple ESMPs. Irrespective of screening exercise, detailed ESIA studies are to be carried out for the proposed hydropower projects. For other renewable subprojects, an ESMP and ESIA would need to be prepared, based on the outcome of the screening exercise and in agreement with the World Bank. Terms of references (ToR) for the proposed ESIA studies have been prepared and presented in **Annex 3**. An outline (table of contents) of the ESIA reports is given in **Annex 4**. ESIAs of the proposed projects will be prepared following the **Annexes 3** and **4**.

6.3 Step 2: E&S Considerations in Subproject Design and Analysis of Alternatives

Environmental and social issues will be mainstreamed into the Project design through a detailed analysis of alternatives of the subproject location, alignment, design, technology, and construction approach. The primary objective of the 'analysis of alternatives' is to identify the location/design/technology for a particular subproject that would generate the least adverse impact and maximize the positive impacts.

The criteria to be considered in evaluating various alternatives will be based on the following sub-criteria:

- Technical Aspects: Robustness, constructability, geology, and maintenance requirements.
- Financial Aspects: Construction cost and maintenance cost

- Environmental Aspects: project footprints, impacts on terrestrial and aquatic ecology, and
- Social Aspects: Land acquisition, Resettlement, nuisance, and socioeconomic impacts.

The following technologies will be analyzed thoroughly in the respective subproject specific ESIA using criteria described above:

- **Fish Passes**. Fish passes are feasible in the proposed subprojects due to the limited height of the weir. The design of fish passes should consider the requirements of snow carps and other native fish species. These could include the required water depth, water discharges, flow velocities, and gradient, etc.
- **Environmental Flows**. Environmental flows shall be designed based on the requirement of downstream uses between the weir and tailrace. The assessment should include the identification of downstream users (irrigation, drinking, fisheries, etc.) and requirements for aquatic ecology (riparian habitats and fish).
- **Baseload and Peaking Operations**. If there is a proposal to operate the plant for peaking operations, the proposed operational plan should consider the downstream impacts of the tailrace.

6.4 Step 3: ESIA Studies

6.4.1 Baseline Data Collection

Project influence area for each project will be identified covering areas likely to be directly or indirectly affected by the subproject construction and operation, and their associated facilities; areas that will be subjected to impacts from unplanned but predictable developments caused by the subproject, and areas that will be subjected to cumulative impacts that result from the subproject in conjunction with the other activities in its area of influence.

Baseline environmental data of the project influence area (covering physical, chemical, biological, and socioeconomic environment) will be collected through a review of secondary literature and primary data collection/survey. Primary data collection will be carried out for assessment of fish migration, riparian habitats, wildlife habitats, forests and other ecological conditions in the project influence, ambient air and noise quality, and surface water and groundwater quality. Primary surveys will also be carried out to establish the baseline socioeconomic conditions of the communities in the Project area. Details of surveys to be carried out are given in the ToRs (**Annex 3**).

6.4.2 Impact Assessment

Based on the initial assessment, potential impacts and risks of the proposed projects have been identified and presented in previous **Chapter 5**.

Detailed characterization and assessment of these impacts will be carried out in the respective project-specific ESIA. In addition, the impacts of the proposed subprojects on the environmental and social components will be identified through consultation with experts and the local community. The impacts will be analyzed and graded qualitatively (e.g. high, medium, low) in order to identify the major impacts. Potential impacts will be predicted using the professional judgment of the multi-disciplinary team members based on baseline information collected and any modeling studies if required. The impact assessment will also consider both cumulative and induced impacts of the subprojects.

In addition to subproject specific ESIA, PEDO would also conduct a cumulative impact assessment (CIA) with the overall goal of CIA to better understand the environmental and social impacts and opportunities for hydropower development in the Swat River basin consistent with the principles of sustainability. CIA

will be done for the whole basin considering the investments to be identified by the Program. Given the critical role of water resources in the project areas, this study will seek to support the efforts of the Government of Khyber Pakhtunkhwa to integrate hydropower development into an overall long-term sustainable vision for the development of the province's economy. The initial assessment on CIA and further CIA studies to be carried out under the Program area given in the ESIA of Gabral-Kalam Hydropower Project.

6.4.3 Environmental and Social Management Plan

ESMPs will be prepared in order to address all the identified potential environmental and social impacts and risks following the principles of the mitigation hierarchy. To the extent feasible, all potential impacts and risks will be avoided through design changes, and if avoidance is not possible – measures will be taken to minimize the magnitude of the impact. Mitigation measures will be proposed for all the significant impacts. If the residual impacts are still significant even after applying the mitigation measures, compensation measures will be proposed. Further, enhancement measures will be proposed for increasing the benefits of positive impacts. A sample mitigation plan, as a guideline, is prepared and presented in **Table 6.2** to address the impacts during construction and operation stages. Based on these guidelines, a detailed ESMP will be prepared as part of the subproject ESIA.

Environmental Code of Practices (ECPs) has been prepared under this ESMF to provide guidance to be followed to address general environmental risks due to various activities during planning, design, construction, operation and maintenance phases associated with each subproject. The ECPs will also include mitigation measures to address general environmental and social risks associated with the general construction activities. These ECPs have been prepared in conformity with the World Bank Group General EHS Guidelines and Good International Industry Practice. The ECPs are presented in **Annex 1**.

An environmental monitoring plan will also be prepared in the ESMP to monitor the effectiveness of the mitigation measures and compliance with the environmental standards. A template for this plan is provided in **Annex 5**.

Detailed guidelines for the preparation of A/RAPs are given in RPF.

Physical and cultural resources management framework including chance-Find procedures to be implemented in case any chance finds are made during earthworks have been prepared and are presented in **Annex 6**.

The Gender Management Framework is provided in **Annex 7**, whereas the labor-management framework is presented in **Annex 8**.

Table 6.2: Sample Mitigation Plan

Impact	Mitigation Measures	Relevant ECPs	Responsible for Implementation	Responsible for Supervision
E&S impacts due to Project siting				
1. Loss of natural vegetation and habitats due to land clearing under project footprints	Compensation for the forest department for replantation of trees at higher elevations and developing biodiversity off-sets in case of loss of natural habitats Promotion of wildlife conservation programs in the project area Garbral Kalam project affects two small forest patches. These two forest patches are owned by the communities (except the		PMO	PEDO

Impact	Mitigation Measures	Relevant ECPs	Responsible for Implementation	Responsible for Supervision
	forest trees that are jointly owned with the forest department), and do not constitute as natural habitats as they already under anthropogenic use for development settlements and grazing of their animals. All the affected forest trees are Cedar deodara (IUCN Status: Least Concern), which is a common and popular wood tree used for construction. In addition to tree plantation, the project also supports also support the forest department for afforestation of degraded forest			
2. Acquisition of private land for the construction of project facilities	Adequate compensation and resettlement assistance for affected households as per the entitlement matrix		PMO	PEDO
3. Loss of livelihood due to the permanent acquisition of agricultural lands	Adequate compensation and implementation of income and livelihood restoration plan		PMO	PEDO
4. Impact on residential structures, and wood and fruit trees	Adequate compensation and resettlement assistance for affected households as per the entitlement matrix		PMO	PEDO
5. Employment generation for the local community	The hiring of local people during construction works		Contractor, PMO	PEDO
Environmental impacts during construction				
6. Tree cutting from construction sites	Plantation of trees in the colony and around the reservoir area		Contractor	PMO
7. Generation of spoils (excess excavation) and their disposal	Transport and disposal of spoils and designated muck disposal sites Proper dumping and adequate compaction to avoid dust and release back to the river Landscaping of the disposal areas after completion of works	ECP 1 ECP 5 ECP 6	Contractor	PMO CSC
8. Generation of construction including hazardous waste	Containers of adequate size and numbers in place for collection of various types of wastes (metal, rubbers, used fuels, batteries, etc.) Procurement of services of a waste management contractor for transport and treatment of recyclable and hazardous waste	ECP 2	Contractor	PMO CSC
9. Generation of solid waste from worker's campsites and offices	Segregation of solid waste into kitchen waste (organics), paper and plastic (recyclable) and garbage (non-recyclable) Placement of containers of adequate size and numbers Organic waste will be treated through in-vessel composters and the manure will be given to the local communities Recyclable waste will be compressed through bailers and use services of the waste management contractor Disposal of the garbage at the waste disposal site developed for the project.	ECP 1 ECP 16	Contractor	PMO CSC
10. Wastewater discharges from the construction	Construction of wastewater treatment facilities at the campsite (e.g., septic tank	ECP 3 ECP 4	Contractor	PMO CSC

Impact	Mitigation Measures	Relevant ECPs	Responsible for Implementation	Responsible for Supervision
camps, sites, and batching plants	and soak pit) and at the worksites (sedimentation tanks for batching plants and discharges from tunnels; and site drainage)	ECP 16		
11. The potential risk of soil pollution by construction works	Storage of fuels and chemical in contained facilities Availability of spill kits for immediate clean-up of any oil spills	ECP 5 ECP 6 ECP 7	Contractor	PMO CSC
12. Increased traffic on the local roads	Traffic Management Plan (e.g. avoiding school hours, following sped limits, hiring licensed drivers, etc.) including awareness-raising and safety measures. PMO will coordinate with other relevant government departments like traffic police, district commissioner office, tec.	ECP 15	Contractor PMO	PMO CSC
13. Air and noise pollution from construction and traffic	Compliance with NEQS on vehicle and machinery emissions, and ambient noise	ECP 10 ECP 11	Contractor	PMO CSC
14. Sourcing of aggregates for concrete works	Reuse of excavated material from the weir site to the extent feasible Source the material from the licensed quarry and borrow sites. Crushing of the boulders to the aggregates and sand with adequate dust control measures in place.	ECP 9	Contractor	PMO CSC
15. Impact on river habitat due to construction activities and drying of river section between two cofferdams	Control of wastewater and sediment releases to the river Monitoring and relocation of trapped fish into the downstream waters	ECP 3 ECP 14	Contractor	PMO CSC
16. Impacts from increased human activities on flora and fauna	Use of non-wood fuel for cooking and heating; Code of conduct for workers and employees' protection of flora and fauna Awareness-raising to workers on the protection of flora and fauna.	ECP 12 ECP 13	Contractor	PMO CSC
Community and Occupational Health and Safety Impacts during Construction				
17. Safety hazards due to increased traffic especially for children and elderly people	Traffic Management Plan (e.g. avoiding school hours, following sped limits, hiring licensed drivers, etc.) including awareness-raising and safety measures. PMO will coordinate with other relevant government departments like traffic police, district commissioner office, tec.	ECP 15	Contractor PMO	PMO CSC
18. Community exposure to work hazards	Barricade the work areas with hard fencing to prevent the entry of community in the construction areas. Placing of adequate signboards and flagmen to divert the community away from the construction works.	ECP 16 ECP 17	Contractor	PMO CSC
19. Dust from vehicular movement on local roads and construction activities	Frequent sprinkling of water on the local roads and worksites to control dust emissions	ECP 10	Contractor	PMO CSC

Impact	Mitigation Measures	Relevant ECPs	Responsible for Implementation	Responsible for Supervision
20. Risk of damage to houses by blasting activities (through fly rock and vibration)	Use of controlled blasting and placement of sandbags on the boreholes to prevent fly rock Adequate compensation for any affected structures	ECP 11	Contractor	PMO CSC
21. Impacts from the influx of labor from the outside areas	A construction camp will be built with all adequate facilities (safe drinking water and sanitation, kitchen, rest areas, recreation) The Contractor will establish a mechanism to collect the complaints from the workers and address those complaints by the approved GRM plan	ECP 16 ECP 17	Contractor	PMO CSC
22. Possible cultural conflicts between communities and workers and health impacts, including women's privacy and access, and gender-based violence	The contractor's code of conduct shall cover the program to promote awareness to the construction workers on respecting the local community, avoiding gender-based violence, and the risk of spreading sexually transmitted diseases. The Contractor's monthly training program will cover topics related to Code of Conduct such as sexual harassment particularly towards women and children, violence, including sexual and/or gender-based violence and respectful attitude while interacting with the local community	ECP 17	Contractor	PMO CSC
23. Workers Health and Safety due to hazards associated with the construction activities (instream, underground tunnels, mountain slopes, working on heights and trenches, cold weather, etc.)	Conduct a 'job hazard analysis' at the new construction site to identify potential hazards that may arise from the proposed works or working conditions to the project workers and implement necessary control measures. Use of relevant personal protection equipment at all times Regular training program for workers on occupational health safety (monthly training and daily toolbox talks) Incident investigation and reporting Availability of firefighting, ambulance, medical and rescue facilities at the site for implementation of an emergency response plan	ECP 18 ECP 19 ECP 20	Contractor	PMO CSC
24. Risk of child labor	No hiring of workers less than 18 years of age	ECP 15	Contractor	PMO CSC
25. Impact on women and girls' privacy due to the presence of construction labor	Measures to protect the privacy of women and girls by the contractor, sub-contractors and service providers	ECP 16 ECP 17	Contractor	PMO CSC
26. Labor unrest due to unplanned layoff	Clear terms of employment with a defined period of employment Develop a labor retrenchment plan to layoff the labor and disseminate information		Contractor	PMO CSC
E&S Impacts during O&M				
27. Barrier effect on fish migration	A fish ladder will be built into the design of the dam		PEDO	

Impact	Mitigation Measures	Relevant ECPs	Responsible for Implementation	Responsible for Supervision
	Sensors will be placed on the ladder and monitored to count the fish and to assess the effectiveness of the ladder			
28. Reduced water flow between weir and tailrace during low flow season	Release of environmental flows during low flow season Downstream monitoring and adjustment of flows if required.		PEDO	
29. Risk bird collisions and electrocutions with the transmission line	Identification of areas that are potential for collision and installation of bird diverters. Insulation of exposed parts of towers to prevent electrocution.		PEDO	
29. Generation of solid waste from the staff colony	Implement a solid waste management plan		PEDO	
30. Community health and safety of the PEDO staff and family living in the colony	Maintenance of water supply, sanitation and drainage facilities in the residential colony.			
31. Impacts from electric and magnetic fields from transmission lines on community health and safety	Will comply with WBG EHSGs/WHO recognized standards on EMF through design considerations		PEDO	
32. Workers health and safety during routine operation and maintenance	Implementation of OHS plan		PEDO	
33. Maintenance of tourist facilities near the hydropower sites	The environmental assessment of subprojects will also cover potential impacts associated with the tourism development activities associated with the subprojects and propose adequate mitigation measures. The tourist facilities in the subprojects will be designed with adequate waste collection and toilet facilities. Maintenance of tourist facilities including cleaning and collection of wastes.		PEDO	

Gender-Based Violence (GBV)[5] and Sexual Exploitation and Abuse (SEA)[6]

During the gender assessment of one of the subprojects (GK KPP), consultations were carried out with the women in the project influence area which also covered the discussions on GBV/ SEA. The women reported that domestic violence is not common in the project area except few exceptional cases, but no

[5] Gender-based violence (GBV) is an umbrella term for any harmful act that is perpetrated against a person's will and that is based on socially ascribed (i.e. gender) differences between males and females. It includes acts that inflict physical, sexual or mental harm or suffering, threats of such acts, coercion, and other deprivations of liberty. These acts can occur in public or in private (IASC 2015). Women and girls are disproportionately affected by GBV across the globe

[6] Any actual or attempted abuse of a position of vulnerability, differential power, or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another. Sexual abuse is further defined as "the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions." Women, girls, boys and men can experience SEA. In the context of World Bank supported projects, project beneficiaries or members of project-affected communities may experience SEA.

one reports it as for them this is a not socially acceptable matter. No rape cases have been reported in the past years. Women visit relatives and family friends of their own tribe within or outside of their villages. Women also go out for shopping. However, as the markets are on an average of 4.5 km away from the villages, the women are accompanied by either an older woman or a male member of the family or a male child. Women travel for up to 30 minutes, 3-4 times a day to collect water from nearby streams and springs for drinking, cooking and cleaning and washing purposes. Women also travel to the river for washing and cleaning purposes. They also help the male members of their families in agriculture fields which are generally next to their homes. However, women go in pairs and do not travel alone. Women always accompany the male members of the households to the Basic Health Units (BHU) and to the hospital located in Kalam town and Mingora city. Women rarely go out for the purchase of grocery items and grocery shopping is mostly done by the male members of the family. The girls of better-off and middle-income households are allowed to go out to get an education while in lower-income households they are not allowed to go out without a male member of the household accompanying them.

the Program area is not very populated. Therefore, interaction between the construction labor force and the communities is also expected to be limited, particularly with women due to the conservative culture in the region. The current level of GBV/SEA risk is quite low. The program is unlikely to have any significant labor influx. Only a small number of high-skilled workers are expected to travel to Project construction sites. The likelihood of GBV/SEA is thus considered low. However, the ESMF provides a general guide to the PMO to screen the projects and institute measures to address GBV/SEA risks and impacts of the investments/projects to be financed under the Program. This risk assessment will be made for each of the projects based on the country and legal context, gender norms and beliefs, and national capacity to respond. In addition, several project-specific factors including project location, type of infrastructure to be constructed, accessibility of women for consultations, poverty levels, accessibility for supervision of project and others will be considered for determining the risk levels.

Proactive/Preventive Measures

Commensurate with this risk level and also to be proactive, the Program has proposed several proactive measures as below:

- Strengthen the Contractors' obligations and capacity to public health and safety risks and ensure contractor supervision capacity to monitor the mitigation of these risks.

- Preparing code of conduct for PEDO, PMO, contractors, sub-contractors and service providers (such as security agencies, catering, transport or any other services) on GBV/SEA prevention, and by integrating these measures/clauses in bidding documents.
- Proactive GBV/SEA prevention measures will be put in place, such as GBV/SEA related training to sensitize workers and the local population in the program implementation area and ensuring that GRM will also take care of GBV/SEA related issues, if any.
- There will be adequate mechanisms in place to protect local vulnerable population especially women and minors from risks associated with the influx of workers (harassment, underage sex). This mechanism will ensure sensitization and enforcement of code-of-conduct by the Contractor employees and workers and all other parties that are involved in the project implementation.
- Inclusion of clause on GBV/SEA behavior obligations in the employment contracts of all employees and construction workers aimed at strengthening measures to address and prevent GBV/SEA in the workplace and construction areas.

- Additionally, the Contractor will employ their skilled staff and apply unskilled construction labor from the local population as far as possible to minimize an influx of outsiders into the communities.
- Awareness-raising and sensitization of all employees and construction workers on GBV/SEA prevention.
- The PMO will ensure compliance with the GoKP Act and policy and WB requirements related to GBV/SEA.
- The third-party monitoring agency of the project will also cover the monitoring of GBV/SEA prevention measures.
- Measures for receiving, reviewing and acting as appropriate on GBV/SEA concerns at the program management level.
- Documentation and reporting of prevention and response in the progress reports of the Program.
- Prohibiting recruiting child labor.

6.5 Step 4: Stakeholder Consultations and Disclosure

Stakeholder consultation will be used to help identify opportunities and risks, improve subproject design and implementation, and increase subproject ownership and sustainability. Stakeholder consultations will be carried during all phases of the project.

The stakeholders of the Project have been classified into the following two categories.:

- Primary Stakeholders: include people, groups, institutions that either has a direct influence on the project or are directly impacted (positively or adversely) by the project and its activities. These stakeholders include district-governments that are involved in project implementation, local communities, civil society organizations, private landowners, and poor non-titled persons/households.
- Secondary stakeholders: are those that have a bearing on the project and its activities by virtue of their being closely linked or associated with the primary stakeholders and due to the influence, they have on the primary stakeholder groups. These stakeholders include all relevant government institutions such as KP EPA, Local Government, NTDC, and non-government organizations.

Stakeholder consultations will be carried out at two stages. The first-stage stakeholder consultations will be carried out during the preparation of the safeguard instruments to obtain their feedback and address their concerns. The second stage consultations will be carried out after the preparation of draft ESIA to share the outcome of the ESIA study and to obtain their feedback.

The ESIA and RAP of each subproject will be disclosed on the PEDO website and on the World Bank website. The Executive summary of the ESIAs and RAPs will be translated into Pashtu and will be disclosed on the EPDO website. Hardcopies of the Executive Summary reports of Pashtu will also be made available in local union councils.

A detailed framework for stakeholder engagement for the Program is included in **Annex 9**, which will be followed during the implementation of the subprojects.

6.6 Step 5: Submission of ESIA for KP EPA and World Bank Clearance

ESIA and RAP for each subproject will be submitted to World Bank and KP EPA clearance and approval before initiating any construction works. In addition, the proposed subprojects require various approvals from the relevant government departments during implementations. These requirements are summarized in **Table 6.3**.

Table 6.3: Environmental Approvals and Permits Required during Implementation of the Project

	Details of Approval and Permits	Issuing Authority	Requirements	Responsible Agency	Timing
1	**Clearance of ESIA and A/RAP**	World Bank	Submission of ESIA and A/RAP	PEDO	Prior to Construction of the project
2	**Environmental Approval** for the overall construction of the Project	KP EPA	Submission of ESIA	PEDO	Prior to Construction of the Project
3	**Environmental Approval** for establishing crusher plants	KP EPA	Submission of IEE Application	Contractor	During the construction phase
		Forest Department	Submission of Request	Contractor	During the construction phase
		Industries Department	Submission of Request with layout and location maps	Contractor	During the construction phase
		Mines and Mineral Department	Submission of Request	Contractor	During the construction phase
4	**Permit** for storage of blasting material	Deputy Commissioner of District	Submission of a request with the location map of the explosive store	Contractor and PEDO	During the construction phase
5	**Permit** for the transport of blasting material	Chief Inspector of Explosives	Submission of a request along with a recommendation letter from the Employer	Contractor and PEDO	During the construction phase
6	**Permit** for cutting of forest trees	Forest Department	Submission of a request	PEDO	During the construction phase
7	**Permit** for the use of quarry and excavated material	Mines and Mineral Department	Submission of a request with the location map of the quarry area	PEDO will sign the lease agreement and handover it to the contractor	During the construction phase
8	Batching Plant	KP-EPA	No objection certificate is not required for establishing a batching plant, but the project has to inform EPA about the facility with a surety that all mitigation measures to control pollution will be adopted.	Contractor	During the construction phase
9	**Environmental Approval** for the operation of the Project	KP EPA	Submission of a compliance report on the implementation of conditions and recommendations given in the	PEDO	After completion of the Construction

	Details of Approval and Permits	Issuing Authority	Requirements	Responsible Agency	Timing
			Environmental Approval for construction.		and prior to operation

6.7 Step 6: Environmental and Social Requirements in Bidding Documents

PMO will include the following Environmental, Social, Health and Safety (ESHS) Conditions in the bidding documents to ensure all the mitigation measures proposed in the ESMPs are effectively implemented:

- Past performance of the Contractor on ESHS aspects including sexual exploitation and abuse and gender-based violence;
- ESHS Staff with the Contractor;
- Performance Security;
- Mitigation measures to address construction impacts (which will be prepared based on Table 6.1);
- Payments for implementation of ESHS measures;
- Code of conduct of Contractor's Personnel;
- Management Strategies and Implementation Plans (MSIP) to manage the ESHS Risks.

Each of the above conditions is elaborated in **Table 6.4**.

Table 6.4: ESHS Conditions in the Bidding Documents

Condition	The rationale for the inclusion of this Condition in the Contract	Specifications to be included in the Bidding Documents	Responsibility	
			Bidders	PMO
1. Past performance of the Contractor on ESHS is one of the eligibility criteria for the shortlisting process	The contractor's past performance on compliance with ESHS is an indicator of the contractor's commitment and capability for implementation of the ESMP	The Bidder shall "declare any civil work contracts that have been suspended or terminated and/or performance security called by an employer for reasons related to the non-compliance of any environmental, or social (including sexual exploitation and abuse (SEA) and gender-based violence (GBV) or health or safety requirements or safeguard in the past five years".	Bidder to make the Declaration	PMO use this information to seek further information or clarifications in carrying out its due diligence
2. Contractor shall propose adequate ESHS Specialists in his team (Environmental Specialist, OHS specialist, Social specialist, site supervisors)	The Contractor's staff should include adequate ESHS specialists who are responsible for the implementation of all mitigation measures on ESHS risks and compliance with ESMP	The Bidder shall propose an Environmental, Social, Health and Safety (ESHS) Specialist as the Contractor's Key Personnel at the Site. The Bidder shall provide details of the proposed ESHS specialist including academic qualifications and work experience. The ESHS Specialist should have a minimum bachelor's degree in engineering or a master's degree in sciences related to environmental management. The Specialist should have 5 years of experience working on	The bidder to submit the CV of proposed ESHS Specialist	PMO will review and approve

Condition	The rationale for the inclusion of this Condition in the Contract	Specifications to be included in the Bidding Documents	Responsibility	
			Bidders	PMO
		monitoring and managing ESHS risks related to hydropower projects or other similar infrastructure projects.		
3. Contractor shall submit ESHS Performance Security for compliance with ESHS obligations	The Contractor should have a financial implication if he could not comply with ESHS requirements. Hence performance security will be collected from the contractor	The Bidder shall submit the ESHS Performance Security in the form of a "demand guarantee" in the amount of three percent (3%) of the Contract Amount.	The bidder will submit a Performance Security	
4. Implement Mitigation Measures to Address Construction-Related Impacts given in ESMP	The mitigation measures to address potential ESHS risks and impacts should be included in the bidding documents. The contractor shall be made responsible for the implementation of the mitigation measures through the necessary conditions in the contract.	PMO will include the ESMP in the General Specifications of the Bidding Document, and the reference to this document will be provided in the Conditions of the Contract as follows: • The Contractor shall implement the mitigation and monitoring measures given in the ESMP to address ESHS risks associated with the construction works. The Consultant shall refer to the ESIA of the Project, which is available on the PEDO website for further guidance. • The Contractor shall comply with the World Bank Group's General Environmental Health and Safety Guidelines and Environmental Code of Practices (**Annex 1**)		PMO will include this condition in the bidding document
5. Payments for implementation of ESHS Mitigation and Monitoring Measures	BOQs on ESHS implementation are included in the Bidding Documents	The budget will be allotted for the preparation and implementation of C-ESMP (including OHS plans), which include waste management, spoil site development, environmental monitoring, etc.	Bidder will quote for the ESHS Management	
6. Code of Conduct for Contractor's Personnel	All workers hired by the Contractor should sign a code of conduct to ensure compliance with ESHS obligations of the Contract	The Bidder shall submit the Code of Conduct that will apply to the Contractor's employees and subcontractors. The Code of Conduct will state that the workers will comply with the following ESHS requirements: • Wearing of Personal Protective Equipment (PPE's) in the workplace at all times • Non-discrimination in dealing with the local community by race,	Bidder shall submit code of Conduct with the bid documents	

Condition	The rationale for the inclusion of this Condition in the Contract	Specifications to be included in the Bidding Documents	Responsibility	
			Bidders	PMO
		ethnicity, gender, religion, disability, sexual orientation, gender identity, social, or health status • Respectful attitude while interacting with the local community • Prohibit sexual harassment particularly towards women and children • Prohibit violence, including sexual and/ or gender-based violence • Respecting the reasonable work instructions • Protection and Proposer use of the property		
7. Contractor's Management Strategies and Implementation Plans (MSIP) to manage the ESHS Risk	The Contractor proposal should include his understanding of the ESHS requirements of the project and the proposed strategies to manage the ESHS risks	The Bidder shall submit Management Strategies and Implementation Plans (MSIP) to manage the following key ESHS risks: • Strategy for the protection of workers and community from the construction-related hazards inside the terminal • Pollution prevention (wastewater, air and noise emissions) and management • A waste management plan for proper collection and disposal of waste • Traffic management plan to ensure the safety of local communities from construction traffic • Hazardous material management plan safe storage and handling • Strategy to address labor influx impacts on the local communities • Gender-based violence and sexual exploitation and abuse prevention and response action plan • Emergency response plan and early warning system The Contractor shall be subsequently required to submit (before mobilization) Contractor's Environment and Social Management Plan (C-	The bidder will submit MSIP along with the Bid Documents	

Condition	The rationale for the inclusion of this Condition in the Contract	Specifications to be included in the Bidding Documents	Responsibility	
			Bidders	PMO
		ESMP) by the above strategies and Condition 4 of this Table.		

6.8 Step 7: Implementation of ESMPs of Subprojects

The steps to be followed during the construction stage of subprojects for effective implementation of ESMP are described in this section.

6.8.1 Contractor's Construction Environmental Action Plan

As a requirement under the bidding documents, the Contractors will need to submit a Construction Environmental Action Plan (E-ESMP) prior to their mobilization for PMU approval. This plan will consist of the following site-specific management plans that will be prepared in compliance with the requirements of the bidding documents, ESMP and World Bank EHS guidelines:

- Waste management plan
- Wastewater discharges management plan
- Air and noise emissions management plan
- Hazardous material management and spill control plan
- Water supply and sanitation management at the worksites and workers' accommodations
- Management of labor influx and facilities for the foreign workers
- Labor recruitment procedures and labor management
- Traffic management plan
- Training plan for ESHS risks including HIV/AIDS, sexual exploitation and abuse, and gender-based violence
- Emergency Response Plan for the project
- Emergency Response Plan for tunnels as per International Tunnel Association
- Grievance Redress Mechanism
- Demobilization plan after completion of works

In addition, the Contractor will need to submit a Job Safety/Hazard Analysis at the beginning of construction works at each new site addressing the measures associated with various hazards at the work sites. These reports will be reviewed and approved by the PMO after ensuring the mitigation measures proposed in the analysis are in place at the work sites.

6.8.2 Step 8: Compliance Monitoring and Reporting

The overall responsibility for ESMP implementation will rest with the PEDO/PMO. However, at the construction areas, environmental and social staff of the Contractor are responsible for implementing the ESMP, while the environmental and social specialists of the Construction Supervision Consultant and PMO will be responsible for the monitoring of the EMSPs throughout the Project implementation.

Compliance monitoring comprises of on-site inspection of the construction activities to verify that measures identified in the ESMP and that are included in the clauses for contractors are being implemented. This type of monitoring is similar to the normal technical supervision tasks ensuring that the Contractor is achieving the required standards and quality of work.

The following reports will be prepared on the implementation of ESMP:

- Monthly environmental monitoring reports by the Contractor on the status of implementation of environmental, social, health and safety aspects, and
- Quarterly environmental monitoring reports by the PMU on the status of implementation of environmental, social, health and safety aspects

The topics to be covered in these reports are summarized below:

- Environmental incidents or non-compliance with contract requirements
- Health and safety incidents, accidents, injuries and all fealties that require treatments
- Inspection of Workers accommodation; Workers and community grievances
- Training conducted and their content;
- Environmental issues encountered and how they were mitigated and
- Compliance status on ESMP requirements

Regular training programs will be conducted throughout the project implementation on the EHS issues associated with the construction activities (further discussed in **Section 7.2**).

7 Project Institutional Framework

This Chapter describes the institutional framework for the management of the overall Program and also its environmental and social aspects.

7.1 Institutional Arrangements for ESIA Preparation and Implementation

PEDO will be responsible for the overall management, supervision, and execution of the Program through the Project Management Organization (PMO). A full-time Project Director (PD) will be appointed to head the PMO.

The overall responsibility of environmental performance, including ESMP implementation, will rest with the PMO. Institutional arrangements for safeguard implementation of the Program are given in **Figure 7.1**. PEDO has an existing 'Environmental and Social Unit (ESU),' which needs to be fully staffed for the management of environmental and social impacts of the Program. PEDO will depute these specialists to PMO to ensure the effective implementation of ESMF. In addition, PMO will also hire independent ESIA consultants for the preparation of safeguard instruments for the proposed subprojects.

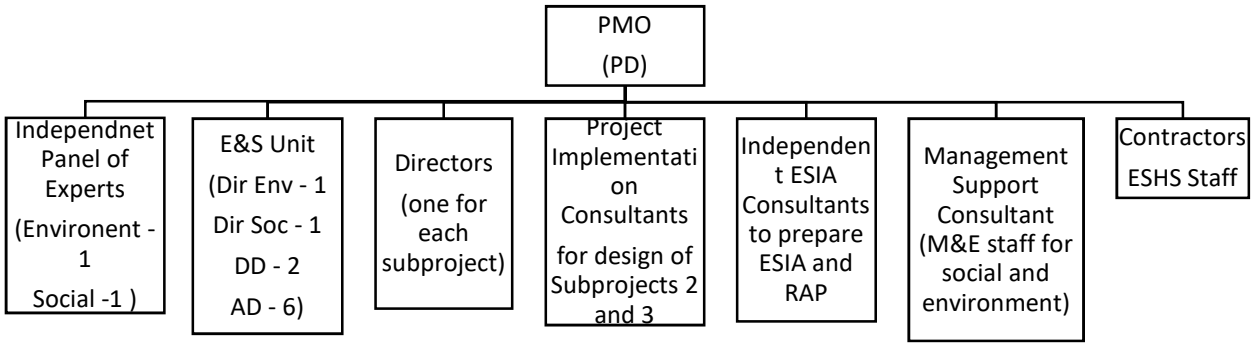

Figure 7.1: Organogram for Environmental and Social Management of the Project

Details of environmental and social staff associated with various consultants and contractors to be engaged under the Program are summarized below:

- **Environmental and Social Staff in the PEDO/PMO.** The Environmental and Social Unit (ESU) of PMO includes the following staff:
    - Two Directors (one for the environment and one for social)
    - Three Deputy Directors (one each for the environment, OHS, Social Development)
    - Six Assistant Directors (two per each Deputy Director)
    - The staff will assist the PMO on issues related to environmental and social management and oversee the independent ESIA Consultants. The Construction Supervision Consultant

(CSC) and contractors will compile quarterly monitoring reports on ESMP compliance, to be sent to the Project Director and also shared with the World Bank, throughout the construction period.

- **Independent ESIA Consultants.** PMO will procure the services of independent consultants for preparation of ESIA of the projects including preparation of RAP
- **Project Implementation Consultant (and Construction Supervision Consultant, CSC)**: The Project Implementation Consultant will be responsible for (i) carrying out feasibility studies and detailed engineering designs of the projects, and (ii) construction supervision of these projects. The CSC will have adequate environmental, health and safety specialists to implement the environmental and social management plans of the ESMP.
- **Management Support Consultant (MSC**): The Management Support Consultants support in project management and carrying out day to day activities of PEDO. Support various departments of PEDO in operation of various functions; Oversee Budgetary and financial Management; Prepare and assist in implementing Quality Control and Quality Assurance Plan; Contractual advice, variation orders and settlement of disputes, claims; Support in Implementation of the Social Safeguard Plans (environment, resettlement etc.
- **Planning Consultant**: The Planning Consultant will develop a Comprehensive Plan for Hydropower and Energy Systems in KP through (i) Assessment and Appraisal of potential hydropower and alternative renewable energy sites in KP, and preparation of a long-term integrated plan for development of renewable energy and hydropower resources in the province, and (ii) Sequencing of the investment program over 10 years, 20 years and 30 years periods considering priorities, objective agreed criteria, demands and implementation constraints etc. and electricity price for the generators and consumers. The Consultant will also carry out feasibility studies for some priority subprojects.
- **Contractors:** DBO/DO Contractors for Component 2 and the other Contractors for Component 3 will also have adequate environmental, health and safety specialists to implement the environmental and social management plans of the ESMP.
- **Monitoring and Evaluation Consultants (M&E Consultants).** The PMO will also engage an independent organization to carry out third-party environmental and social monitoring during project implementation.

The roles and responsibilities of PMO's environmental and social staff and consultants for environmental and social management of the Project are given in **Table 7.1**.

Table 7.1: Roles and Responsibilities in Environmental and Social Management of the Project

Organizations	Responsibilities
PMO	• Ensure that all project activities are well-managed and coordinated. • Recruitment of consultants for ESIA studies; and approval of ESIA by the KP EPA and WB • Procurement of works and goods. • Payment of compensation to the project affected households
E&S Staff within PMO	• Reviewing consultant deliverables related to environmental assessment, reviewing bid documents for inclusion of ESMP measures, supervising construction activities, producing periodic monitoring reports, • Supervising CSC for the implementation of ESMP • Closely coordinate with other concerned agencies, local governments, and communities to support the implementation of ESMP
ESIA Consultants	• Carrying out ESIA studies in compliance with the KP EPA and World Bank safeguard polices and following the procedures described in the Program's ESMF

Organizations	Responsibilities
	• Prepare ESIA and RAP
Project Implementation Consultants (Construction, Supervision Consultants, CSC)	• Prepare feasibility studies and detailed engineering designs for projects • Supervise civil works, ensuring compliance with all design parameters including quality requirements and ESMP implementation • Prepare monthly reports and submit to PMU • CSC will have dedicated environmental, OHS and social staff
Management support Consultants	• Overall Project support to PMO • Support the E&S staff of PMO in carrying out their responsibilities • Review of ESIA reports prepared by ESIA Consultants • Ensuring inclusion of ESMP in bidding documents • Providing training on ESMP principles and requirements to CSC, contractors, PEDO field staff, and others as needed to ensure effective implementation of ESMP
Contractor	• Prepare construction ESMP with site-specific mitigation measures. • implementation of mitigation and monitoring measures proposed in the ESMP • Each contractor will recruit an Environmental, Health, and Safety Manager, who will be responsible for implementing the contractors' environmental, health and safety responsibilities, and liaising with government agencies. S/he will have adequate environmental, social, health, and safety staff.
Independent Panel of Experts	• Independent review of the project designs, ESIAs and RAPs • Independent assessment on project implementation

7.2 Capacity Building and Training

Capacity building programs will be conducted to all the Program staff including engineers and relevant stakeholders during initial stages of the Program to sensitize them on the management of environmental and social issues, and to build the requisite capacities.

The proposed training plan is given in **Table 7.2;** it will be reviewed and finalized during the project-specific ESIAs. PEDO's independent ESIA consultants will deliver the training programs. At the construction site, CSC will take the lead in implementing the capacity building plan, though the contractors will also be responsible for conducting training for their own staff and workers. The various aspects that are covered under the capacity building will include general environmental and social awareness, key environmental and social sensitivities of the area, key environmental and social impacts of the project, ESMP requirements, OHS aspects, and waste disposal. **Table 7.2** provides a summary of various aspects of environmental and social training to be conducted at the construction site. PMU may revise the plan during the project implementation as required.

Table 7.2: Environmental and Social Training Programs

Contents	**Participants**	**Trainer**	**Schedule**
General environmental and socio-economic awareness; Environmental and social sensitivity of the project influence area; Key findings of the ESIA; Mitigation measures; EMP;	The selected staff of PMO and PEDO including their consultants	Independent ESIA Consultants or through a training program.	Before the start of the project activities. (To be repeated as needed.)

Contents	Participants	Trainer	Schedule
Social and cultural values of the area.			
General environmental and socio-economic awareness; Environmental and social sensitivity of the project influence area; Mitigation measures; Community issues;	PEDO personnel who will in charge of Operation & Maintenance and the Engineers from the local contractor	CSC E&S Staff	During project implementation (To be repeated as needed.)
E&S issues associated with the construction works ESMP requirements of the contractors. Workers Health and Safety Grievance Redress Mechanism	Construction crew	Contractors EHS Staff	Prior to the start of the construction activities and during the construction activities (To be repeated as needed.)

7.3 Grievance Redress Mechanism

The WB requires that the project developer establish and maintain an effective grievance mechanism, ensuring that any stakeholder complaints and concerns are received, handled and resolved effectively, in a prompt and timely manner. Maintaining close interaction with the local community and promoting its development should be an essential element of corporate policies and activities of all borrows. A detailed description of the existing Grievance Redress Mechanism (GRM) of the PEDO and the proposed GRM for the overall Program is given in the RPF. A summary of this description is presented here.

7.3.1 PEDO's Existing GRM

PEDO has a provision for receiving written complaints manually and their redressal but does not have standard operating procedures to receive and redress complaints and there is no practice of redressing anonymous complaints. Currently, PEDO has been receiving and redressing complaints under the "Pakistan Citizen Portal," a government-owned Mobile Application established by Prime Minister's Performance Delivery Unit and is being used as a tool to promote citizen-centric and participatory governance. It is an integrated citizens grievance redressal system connecting all government organizations both at federal and provincial levels.

7.3.2 Proposed GRM for the Program

A program-specific grievance redress mechanism (GRM) will be established to receive, evaluate, and facilitate the resolution of affected parties' concerns, complaints, and grievances about the environmental and social performance at the level of the Project.

A three-tier GRM has been designed to provide a time-bound, early, transparent and fair resolution for APs and other stakeholder grievances regarding E&S management of each project. All complaints received verbally or in writing will be properly documented and recorded in the Complaint Management Register(s). In addition, an easy-to-access web-based GRM will be developed. If the complaint cannot be resolved at these three tiers, the complaint will have a choice to lodge his/her complaint at the related court of law. The GRM for the Program is outlined below and consists of three levels with time-bound schedules for addressing grievances.

First Tier of GRM. The PMO's project site office will be the first tier of GRM, which will offer the fastest and most accessible mechanism for the resolution of grievances at the local level. A local level GRC will be formed for this purpose headed by the Project Director with the membership of Director-ESU, Land Acquisition Collector and other relevant staff of Revenue Department, contractors' representatives, consultants' representatives, representatives of other relevant departments, and two members from each APs Committee. At this tier, the designated E&S staff of PMO site office will make attempt to resolve the complaints within two to10 working days, depending on the nature of grievance. The PD will convene the meetings of local GRC and conduct proceedings informally to reach an amicable settlement between the parties within 10 days of receiving a complaint (verbally or in writing) from an affected person or their representative. The report of the GRM meetings will be recorded in writing, and copies will be provided to the parties involved. Grievances will be documented with personal details (name, address, date of complaint, nature of the complaint, etc.) unless anonymity is requested. A tracking number shall be assigned to each complaint/grievance. Should the grievance remain unresolved or the AP not satisfied with the decision, the grievance can be lodged with the Program level grievance redress committee, led by the head of PMO.

Second Tier of GRM. The E&S staff in PMO will refer to the unresolved issues or grievances (with written documentation) to the second tier of GRM, the PMO central level Grievance Redress Committee (GRC). The central level GRC shall be established by PEDO and will consist of the following persons: (i) a PEDO representative from senior management; (ii) the head of PMO will act as secretary of the GRC; (iii) Project Director of respective project; (iv) representative of DC office; (v) representative of PIC; (vi) Chief Resident Engineer of the Consultants (on-call); (vii) representative of relevant government offices (on-call); (viii) two to three representative of respective project-affected people (on-call). A hearing can be called with the GRC, if necessary, where the AP(s) can present details of his/her/their concern/grievance. The GRC will meet as necessary when there are grievances to be addressed. The GRC will suggest corrective measures at the field level and assign clear responsibilities for implementing its decision within 25 working days, depending on the nature of the grievance. If the complainant unsatisfied with the decision, the existence of the GRC shall not impede the complainant's access to the government's administrative or judicial remedies.

Third Tier of GRM: In the event that a grievance cannot be resolved directly by the second tier GRC or If complainant is dissatisfied with the decision of GRC, the affected people can seek alternative redress through the CEO or Board of Directors of PEDO, district administration, the Secretary Energy and Power Department or higher-level administrative authorities, the Pakistan Citizen Portal or the court of law, as appropriate.

Monitoring and reporting. The monitoring reports of RAP and ESMP implementation will include the following aspects pertaining to progress on grievances: (i) number of cases registered, level of jurisdiction (first, second, third tiers), number of hearings held, decisions made, status of pending cases; and (ii) lists of cases in process and already decided upon, may be prepared with details such as name with copy of NIC, complaint number, date of application, date of hearing, decisions, remarks, actions taken to resolve issue(s), and status of grievance (i.e., open, pending, closed).

7.3.3 Proposed GRM for Construction Workers

The GRM with its present scope addresses the grievances/complaints lodged by the project affected persons and other local stakeholders. But according to the lessons learned in various project contexts, there is also a need to establish a separate GRM to deal exclusively with those complaints that involve workers employed by the Contractors for construction activities. Such grievances may involve wage rates and unpaid overtime works; irregular and partial payments; lack / inadequacy of living accommodations;

lack of clean drinking water and sanitation facilities; lack of medical care in emergencies; lack of protection against gender-based violence (GBV) by labor suppliers, supervisors, and others who also deal with workers.

The GRCs dealing with labor grievances / complaints will have members who are directly and indirectly associated with the construction works. The GRC will include a PMO official who is in charge at the worksite as the convener, resident engineer of the CSC, a worker's representative, and the contractor's representative. The convener will designate an official to receive the complaints and ensure the complainant does not lose his job and is not intimidated into withdrawing the complaint before the formal hearing.

To ensure impartiality and transparency, hearings on complaints will be held in a non-threatening environment and will remain open to all other workers on the site. The GRCs will record the (i) details of the complaints; (ii) reasons that led to acceptance or rejection of the individual cases, as well as the number of accepted and rejected cases; and (iii) decisions agreed with the complainants. PMO will keep records of all resolved and unresolved complaints and grievances and make them available for review as and when asked for by the World Bank and other interested entities/persons.

7.4 Budget for Preparation and Implementation of ESIA/ESMPs and A/RAPs

The cost of preparing and implementing ESIAs/ESMPs and A/RAPs, including resettlement and local area development programs, has been tentatively estimated at USD 13 million and USD 60 million, respectively, for the overall Program. The estimated costs for the procurement of ESIA consultants for the preparation of ESIA/ESMP and A/RAP for the subprojects are estimated to be USD 500,000. Detailed cost estimates will be provided in the ESMPs and RAPs of respective projects.

8 Stakeholder Consultations and Disclosure

This Chapter provides a brief description of the consultations carried out with the key stakeholders while preparing the present ESMF and also a framework for the future consultations to be carried out during the project-specific ESIAs and A/RAPs.

8.1 Consultation Meetings

Public consultations were carried out during the preparation of the ESIA and A/RAP of the Gabral-Kalam HPP and also while preparing the present ESMF. Two consultation meetings were conducted, one in Peshawar on October 21, 2019, with provincial-level stakeholders (including the KP EPA, Forest, Wildlife and Fisheries Department) and the one in Patrak on November 9, 2019 with the local community and the district government. A total of 79 people participated in these consultation meetings. PEDO has also conducted a few consultation meetings in 2013 while carrying out the preliminary studies on the two subprojects. Details off the consultation meetings are given in **Table 8.1** and photographs of these meetings are given in **Annex 10**.

The purpose of the consultation meetings was to present the overall Program interventions to the stakeholders and know their concerns and expectations regarding the project. During consultations, a Pashtu leaflet was disbursed among the participants to disseminate the message of the project and make aware of the project as well. A presentation was made on the proposed Project interventions, potential environmental impacts and risks, and the planned mitigation measures.

Table 8.1: Details of Public Consultation Meetings

	Location	Date	Number of Participants	Type of Participants
1	Village level community Consultations for Gabral Kalam project	August to October 2019	312	Communities around the project sites, including affected communities
2	PEDO Complex, Peshawar	21 Oct 2019	24	Relevant gov't departments, academia, civil society organizations,
3	Golden Start Hotel, Kalam	7 Nov 2019	70	Affected Persons, relevant gov't departments, public representative, and civil society organizations,
4	Sangam Hotel, Patrak, Upper Dir	9 Nov 2019	65	Affected Persons, relevant gov't departments, public representative, and civil society organizations

8.2 Feedback from the Stakeholder

All the participants of the meetings have largely welcomed the Project interventions. However, they have raised some concerns, which are summarized in **Table 8.2**.

Table 8.2: Feedback on Consultation Meetings

Feedback from Stakeholders	Actions by PEDO
Minimize land acquisition to the extent feasible since the availability of suitable agricultural land is scarce in the project area.	While carrying out the feasibility studies for the GKHPP, PEDO ensured the minimum acquisition of private land.
Adequate compensation for the loss of land. Payments to be made only to the legitimate owners at the prevailing market rates.	The principles and procedures for the valuation of assets at market rate have been laid down in RAP, in detail.
Compensation for land and structures to be paid prior to the construction.	Construction activities will start only after the payment of compensation to the affected communities of their lost land and other assets including resettlement and rehabilitation assistance.
Development schemes such as schools, health centers, mother and child health care centers, vocational training centers separately for men and women should be implemented in the affected villages. And the access road from Kalam to Utror should be rehabilitated.	Local area development programs will be implemented as a part of the Program having several interventions to address priority needs of the local communities particularly the affected population. In addition, a livelihood restoration and improvement plan will be implemented to support the improvement of existing means of livelihoods and alternative off-farm income-earning opportunities including women-specific interventions.
Employment opportunities in the construction phase of the project.	Local workers will be given preference for employment in construction-related works. PEDO will also support the local communities to improve their skills in construction activities.
Construction of fish ladders.	Fish ladders will be designed in the Project technical design.
Employment opportunities should be provided to local skilled and unskilled labor in the project, to improve the livelihood of the locals. At least one-third of the local community, especially PAPs, should be engaged in the project-related jobs.	Contractors will give preference to the local skilled and unskilled labor. Preference will also be given to the PAPs.
The clearance of land should be minimized to the best possible extent.	Cultivation fields will be avoided to the possible extent while selecting the area for the proposed sites. Where unavoidable, compensation will be paid as detailed in the present RAP/ entitlement matrix. The contractor will curtail the clearance through astute planning.
Compensation for land acquisition should be paid before the commencement of work.	Compensation for loss of land, crops, trees, and structures will be paid in accordance with the entitlement matrix presented in this RAP including compensation based on the market rate as well as replacement cost. Vulnerable PAPs have been identified and assistance will be provided to them in addition to entitled compensation.

Feedback from Stakeholders	Actions by PEDO
Compensation should be fair and should be delivered before start of work. Payment of compensation for project-affected person especially vulnerable PAPs should be ensured.	Compensation for any loss to crops, trees, and structures will be paid in accordance with the rates given in the present RAP. These rates have been established based upon the official rates. APC will be established to ensure that compensation is fair and paid in a timely manner. Vulnerable APs have been identified and assistance will be provided to them in addition to the compensation.
While selecting the place for weir and powerhouse, impacts on the structures should be avoided and relocation of settlements should be minimized by changing the design, where possible.	Settlements, houses, and other structures would be avoided to the extent possible until and unless impacts cannot be mitigated and the settlement falls under the proposed site. In such a situation compensation will be paid as per the RAP.
Transport for the relocation of assets and timely compensation to all affected people should be provided.	Transition/ shifting assistance will be provided to the eligible/ entitled persons in addition to the compensation for the lost assets.
The policy framework should be made for compensation of land at market rate.	Compensation against losses of land, crops, trees, structures and other assets will be paid to the affected people in accordance with the RAP.
Spoiled/ damaged lands should be rehabilitated/ restored after the construction work is completed.	The contractor will rehabilitate/ restore the lands damaged by the construction activities.
Local norms should be honored; and construction work should be completed in time	Liaison with the community will be maintained during construction activities. The construction staff will be provided trainings regarding local norms. The construction staff will comply with the code of conduct. Construction activities will be completed in the shortest possible time.
Compensation for the affected cropped area, houses and other private assets should be in harmony with existing market rates/ replacement cost	Compensation against losses of crops, trees, structures and other assets will be paid to the affected people in accordance with the RAP. The compensation rates have been recognized based upon the official rates.

8.3 Consultations to be carried out During ESIA Studies

The stakeholder consultation and engagement are an ongoing process and will continue throughout the Program implementation. The ongoing consultation process could be scheduled on a regular basis with the stakeholders including but not limited to the concerned government departments, local administration, and the community representatives from the proposed project area. A stakeholder engagement framework for the Program is given in **Annex 9**.

8.4 Access to Information

This ESMF will be disclosed on both PEDO and World Bank websites. Executive summary of the ESMF and the RPF will be translated into Urdu and Pashtu and will be published on the PEDO website, and hard copies of these documents will be made available at local union council offices for public access. The ESIA and A/RAP documents to be prepared for proposed projects will also be disclosed on the PEDO and World Bank websites and also will be made available to the local communities by placing them at the local union council offices.

Annex 1: Environmental Code of Practices[7]

The objective of the Environmental Code of Practices (ECPs) is to address all potential and general construction-related impacts during the implementation of the Project. The ECPs will provide guidelines for best-operating practices and environmental management guidelines to be followed by the contractors for sustainable management of all environmental issues. These ECPs shall be annexed to the general conditions of all the contracts, including subcontracts, carried out under the Project.

The list of ECPs prepared for the Project is given below.

- ECP 1: Waste Management
- ECP 2: Fuels and Hazardous Goods Management
- ECP 3: Water Resources Management
- ECP 4: Drainage Management
- ECP 5: Soil Quality Management
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ECP 1: Waste Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
General Waste	Soil and water pollution from the improper management of wastes and excess materials from the construction sites.	The Contractor shall • 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 CSC 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. • Minimize the production of waste materials by 3R (Reduce, Recycle and Reuse) approach.

[7] These Environmental Code of Practices (ECPs) are originally prepared by Dr. Venkata Nukala for Padma Multi-Purpose Bridge Project (2010) and were updated again for Dasu Hydropower Project (2013), Tarbela 5th Extension Hydropower Project and Sukkur Barrage rehabilitation Project (2017) by adding ECPs on Labor Influx, Dredging Works, Tunneling Works and Instream Construction Works.

		• Segregate and reuse or recycle all the wastes, wherever practical. • Prohibit burning of solid waste • Collect and transport non-hazardous wastes to all the approved disposal sites. Vehicles transporting solid waste shall be covered with tarps or nets to prevent spilling waste along the route • Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process. • Provide refuse containers at each worksite. • Request suppliers to minimize packaging where practicable. • Place a high emphasis on good housekeeping practices. • Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all wastes before transportation and final disposal.
Hazardous Waste	Health hazards and environmental impacts due to improper waste management practices	The Contractor shall • 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. • 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. • Collect hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment or disposal at approved locations. • Construct concrete or impermeable flooring to prevent seepage in case of spills

ECP 2: Fuels and Hazardous Goods Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Fuels and hazardous goods.	Materials used in construction have the potential to be a source of contamination. Improper storage and handling of fuels, lubricants, chemicals and hazardous goods/materials on-site, and potential spills from these goods may harm the environment or health of construction workers.	The Contractor shall • Prepare spill control procedures and submit the plan for CSC approval. • Train the relevant construction personnel in the handling of fuels and spill control procedures. • Store dangerous goods in bunded areas on a top of a sealed plastic sheet away from watercourses; and also, under rainwater shed (to prevent contact with rainwater). • Refueling shall 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 disposal site approved by EPA or sold to EPA registered vendors. • Provide absorbent and containment material (e.g., absorbent matting) where hazardous material is used and stored, and personnel trained in the 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 are labeled with the 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. • 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 shall preferably slope or drain to a safe collection area in the event of a spill. • Put containers and drums in permanent storage areas on an impermeable floor that slopes to 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 materials. • Return the gas cylinders to the supplier. However, if they are not empty prior to their return, they must be labeled with the name of the material they contained or contain, information on the supplier, cylinder serial number, pressure, their last hydrostatic test date, and any additional identification marking that may be considered necessary.

ECP 3: Water Resources Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Hazardous Material and Waste	Water pollution from the storage, handling and disposal of hazardous materials and general construction waste, and accidental spillage	The Contractor shall • Follow the management guidelines proposed in ECPs 1 and 2. • 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
Discharge from construction sites	Wastewaters from construction sites and work camps. The construction works will	The Contractor shall • Minimize the amount of exposed soil at any one time (only clear vegetation immediately before construction is about to begin)

	modify groundcover and topography changing the surface water drainage patterns of the area including infiltration and storage of stormwater.	• Install temporary drainage works (channels and bunds) in areas required for sediment and erosion control and around storage areas for construction materials • Install temporary sediment basins, where appropriate, to capture sediment-laden run-off from the site • Divert runoff from undisturbed areas around the construction site • Stockpile materials away from drainage lines • Prevent all solid entering waterways by collecting solid waste, oils, chemicals, bitumen spray waste and wastewaters from brick, concrete and asphalt cutting and transport to an approved waste disposal site or recycling depot • Collect, transport and discharge the septic tank waste from the construction camps in the nearby municipal wastewater treatment plants • 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 shall 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.	The Contractor shall • Ensure that sealed roads used by construction vehicles are swept regularly to remove sediment. • Water the material stockpiles, 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)

ECP 4: Drainage Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Excavation and earthworks, and construction yards	Lack of proper drainage for rainwater/liquid waste or wastewater owing to the construction activities harms the environment in terms of water and soil contamination, and mosquito growth.	The Contractor shall • Prepare a program for preventing/avoid standing waters, which CSC will verify in advance and confirm during implementation • Provide alternative drainage for rainwater if the construction works/earth-fillings cut the established drainage line • Establish local drainage line with appropriate silt collector and silt screen for rainwater or wastewater connecting to the existing established drainage lines already there • Rehabilitate road drainage structures immediately if damaged by contractors' road transports. • Build new drainage lines as appropriate and required for wastewater from construction yards connecting to the available nearby recipient water bodies. Ensure

		wastewater quality conforms to the relevant standards provided by NEQS, before it being discharged into the recipient water bodies. • Ensure the internal roads/hard surfaces in the construction yards/construction camps that generate has stormwater drainage to accommodate high runoff during a downpour and that there is no stagnant water in the area at the end of the downpour. • Construct wide drains instead of deep drains to avoid sand deposition in the drains that require frequent cleaning. • Provide appropriate silt collector and silt screen at the inlet and manholes and periodically clean the drainage system to avoid drainage congestion • 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
Ponding of water	Health hazards due to mosquito breeding	• Do not allow ponding of water especially near the waste storage areas and construction camps • Discard all the storage containers that are capable of storing water, after use or store them in inverted position

ECP 5: Soil Quality Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Storage of hazardous and toxic chemicals	Spillage of hazardous and toxic chemicals will contaminate the soils	The Contractor shall • Strictly manage the wastes management plans proposed in ECP1 and storage of materials in ECP2 • Construct appropriate spill contaminant facilities for all fuel storage areas • Establish and maintain a hazardous materials register detailing the location and quantities of hazardous substances including the storage, use of disposals • 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 to achieve required commercial/industrial guideline validation results
Construction material stockpiles	Erosion from construction material	The Contractor shall • Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds

	stockpiles may contaminate the soils	

ECP 6: Erosion and Sediment Control

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities and material stockpiles	The impact of soil erosion are (i) Increased runoff and sedimentation causing a greater flood hazard to the downstream, (ii) destruction of aquatic environment in nearby lakes, streams, and reservoirs caused by erosion and/or deposition of sediment damaging the spawning grounds of fish, and (iii) destruction of vegetation by burying or gullying.	The Contractor shall • Locate stockpiles away from drainage lines • Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds • Remove debris from drainage paths and sediment control structures • Cover the loose sediments and water them if required • Divert natural runoff around construction areas prior to any site disturbance • Install protective measures on-site prior to construction, for example, sediment traps • Observe the performance of drainage structures and erosion controls during rain and modify them as required.

ECP 7: Topsoil Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Land clearing and earthworks	Earthworks will impact the fertile topsoil that is enriched with nutrients required for plant growth or agricultural development.	The Contractor shall • Strip the topsoil to a depth of 15 cm and store in stockpiles of height not exceeding 2m. • Remove unwanted materials from topsoil like grass, roots of trees and similar others. • The stockpiles will be done in slopes of 2:1 to reduce surface runoff and enhance percolation through the mass of stored soil. • Locate topsoil stockpiles in areas outside drainage lines and protect from erosion. • Construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil. • Spread the topsoil to maintain the physico-chemical and biological activity of the soil. The stored topsoil will be utilized for covering all disturbed area and along with the proposed plantation sites

		• Prior to the re-spreading of topsoil, the ground surface will be ripped to assist the bunding of the soil layers, water penetration and revegetation
Transport	Vehicular movement outside right of way of existing roads or temporary access roads will affect the soil fertility of the agricultural lands	• Limit equipment and vehicular movements within the approved construction zone • Construct temporary access tracks to cross concentrated water flow lines at right angles • Plan construction access to make use, if possible, of the final road alignment • Use vehicle-cleaning devices, for example, ramps or wash down areas

ECP 8: Topography and Landscaping

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Land clearing and earthworks	Construction activities especially earthworks will change topography and disturb the natural rainwater/floodwater drainage as well as will change the local landscape.	The Contractor shall • Ensure the topography of the final surface of all raised lands (construction yards, approach roads, access roads, etc.) are conducive to enhance natural draining of rainwater/flood water; • Keep the final or finished surface of all the raised lands free from any kind of depression that insists waterlogging • Undertake mitigation measures for erosion control/prevention by grass-turfing and tree plantation, where there is a possibility of rain-cut that will change the shape of topography. • Cover immediately the uncovered open surface that has no use of construction activities with grass-cover and tree plantation to prevent soil erosion and bring improved landscaping

ECP 9: Quarry and Borrow Areas Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Development and operation of Quarry and borrow areas. The project will use approved quarry sites available near the project site. This ECP will be	Quarry areas will have impacts on local topography, landscaping and natural drainage.	The Contractor shall • Use only quarry and borrow sites that are licensed by the provincial government and approved by the project management Organization/Implementation Consultants. • Identify new borrow and quarry areas in consultation with Project Director, if required. • Reuse excavated or disposed of material available in the project to the maximum extent possible. • Store topsoil for reinstatement and landscaping.

used only when a new quarry or borrow area to be developed.		• Develop surface water collection and drainage systems, anti-erosion measures (berms, revegetation etc.) and retaining walls and gabions where required. Implement mitigation measures in ECP 3: Water Resources Management, ECP 6: Erosion and Sediment Control • The use of explosives should be used in as much minimum quantity as possible to reduce noise, vibration and dust. • Control dust and air quality deterioration by application of watering and implementing mitigation measures proposed in ECP 10: Air Quality Management • Noise and vibration control by ECP 11: Noise and Vibration Management.

ECP 10: Air Quality Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Air quality can be adversely affected by vehicle exhaust emissions and combustion of fuels.	The Contractor shall • Fit vehicles with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition. • Operate the vehicles in a fuel-efficient manner • Cover haul vehicles carrying dusty materials moving outside the construction site • Impose speed limits on all vehicle movement at the worksite to reduce dust emissions • Control the movement of construction traffic • Water construction materials prior to loading and transport • Service all vehicles regularly to minimize emissions • Limit the idling time of vehicles not more than 2 minutes
Construction machinery	Air quality can be adversely affected by emissions from machinery and the combustion of fuels.	The Contractor shall • Fit machinery with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition in accordance with the specifications defined by their manufacturers to maximize combustion efficiency and minimize the contaminant emissions. Proof of maintenance register shall be required by the equipment suppliers and contractors/subcontractors • Focus special attention on containing the emissions from generators • Machinery causing excess pollution (e.g. visible smoke) will be banned from construction sites • Service all equipment regularly to minimize emissions • Provide filtering systems, duct collectors or humidification or other techniques (as applicable) to the concrete batching and mixing plant to control the particle emissions in all its stages, including unloading, collection,

		aggregate handling, cement dumping, circulation of trucks and machinery inside the installations
Construction activities	Dust generation from construction sites, material stockpiles and access roads are a nuisance in the environment and can be a health hazard.	• Water the material stockpiles, access roads and bare soils on an as-required basis to minimize the potential for environmental nuisance due to dust. Increase the watering frequency during periods of high risk (e.g. high winds). Stored materials such as gravel and sand shall be covered and confined to avoid their being wind-drifted • Minimize the extent and period of exposure of the bare surfaces • Reschedule earthwork activities or vegetation clearing activities, where practical, if necessary, to avoid during periods of high wind and if visible dust is blowing off-site • Store the cement in silos and minimize the emissions from silos by equipping them with filters. • Establish adequate locations for storage, mixing and loading of construction materials, in a way that dust dispersion is prevented because of such operations • Crushing of rocky and aggregate materials shall be wet-crushed, or performed with particle emission control systems

ECP 11: Noise and Vibration Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Noise quality will be deteriorated due to vehicular traffic	The Contractor shall • Maintain all vehicles in order to keep it in good working order in accordance with manufactures maintenance procedures • Make sure all drivers will comply with the traffic codes concerning the maximum speed limit, driving hours, etc. • Organize the loading and unloading of trucks, and handling operations for the purpose of minimizing construction noise on the worksite
Construction machinery	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	The Contractor shall • Appropriately site all noise-generating activities to avoid noise pollution to local residents • Use the quietest available plant and equipment • Modify equipment to reduce noise (for example, noise control kits, the lining of truck trays or pipelines) • Maintain all equipment in order to keep it in good working order in accordance with manufactures maintenance procedures. Equipment suppliers and contractors shall present proof of the maintenance register of their equipment.

		• Install acoustic enclosures around generators to reduce noise levels. • Fit high-efficiency mufflers to appropriate construction equipment • Avoid the unnecessary use of alarms, horns and sirens
Construction activity	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	The Contractor shall • Notify adjacent landholders prior to any typical noise events outside of daylight hours (6 pm to 7 am) if the construction works are being carried out near residential areas • 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 • Install temporary noise control barriers where appropriate • Notify affected people if major noisy activities are undertaken, e.g. pile driving • Plan activities on-site and deliveries to and from site to minimize impact • Monitor and analyze noise and vibration results and adjust construction practices as required. • Avoid undertaking the noisiest activities, where possible, when working at night (6pm to 7 am) near the residential areas

ECP 12: Protection of Flora

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Vegetation clearance	Local flora is important to provide shelters for the birds, offer fruits and/or timber/firewood, protect soil erosion and overall keep the environment very friendly to human-living. As such damage to flora has a wide range of adverse environmental impacts.	The Contractor shall • Reduce disturbance to surrounding vegetation • Use appropriate type and minimum size of machine to avoid disturbance to adjacent vegetation. • Get approval from the supervision consultant for the clearance of vegetation. • Make selective and careful pruning of trees where possible to reduce the need for tree removal. • Control noxious weeds by disposing of at designated dump site or burn on site. • Clear only the vegetation that needs to be cleared in accordance with the plans. These measures are applicable to both the construction areas as well as to any associated activities such as sites for stockpiles, disposal of fill and construction of diversion roads, etc. • Before excavation, mark the trees that must remain on the site and cannot be removed. • Do not burn off 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. • 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 dripline 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-vegetate the area at the earliest practically possible. • Ensure excavation works occur progressively and re-vegetation done at the earliest • Provide adequate knowledge to the workers regarding nature protection and the need to avoid felling trees during construction • Supply appropriate fuel in the work caps to prevent fuelwood collection

ECP 13: Protection of Fauna

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Vegetation clearance	Clearance of vegetation may impact shelter, feeding and/or breeding of animals	The Contractor shall • Restrict the tree removal to the minimum required. • Retain tree hollows on-site, or relocate hollows, where appropriate • Leave dead trees where possible as habitat for fauna • Identify the trees that require specific attention (e.g. the hollow-bearing trees) and fell them in a manner that reduces the potential for fauna mortality. Felled trees will be inspected after felling for fauna and if identified and readily accessible will be removed and relocated or rendered assistance if injured. After felling, hollow-bearing trees will remain unmoved overnight to allow animals to move of their own volition.
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. • The contractor's code of conduct shall include on the protection of flora and fauna, and ban on tree cutting and hunting of animals. Employees found violating would be subject to strict actions including fines and termination of employment.

ECP 14: Protection of Fish

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities in River	The main potential impacts to fisheries are hydrocarbon spills and leaks from riverine transport and disposal of wastes into the river	The Contractor shall • Prepare procedures for the protection of fish and submit them for supervision consultant approval. • Ensure the construction equipment used in the river are well maintained and does not have oil leakage to contaminate river water. • Contain oil immediately on the river in case of accidental spillage from equipment; make an emergency oil spill containment plan (under the Fuels and Hazardous Substances Management Plan) to be supported with enough equipments, materials and human resources. • Do not dump wastes, be it hazardous or non-hazardous into the nearby water bodies or in the river.
Construction activities on the land	The main potential impacts to aquatic flora and fauna River are increased suspended solids from earthworks erosion, sanitary discharge from work camps, and hydrocarbon spills	The Contractor shall • follow mitigation measures proposed in ECP 3: Water Resources Management and EC4: Drainage Management.

ECP 15: Road Transport and Road Traffic Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Increased traffic use of the road by construction vehicles will affect the movement of normal road traffics and the safety of the road-users.	The Contractor shall • Prepare and submit a traffic management plan to the CSC for their approval before the commencement of construction. • Include in the traffic management plan to ensure uninterrupted traffic movement during construction: detailed drawings of traffic arrangements showing all detours, temporary road, temporary bridges temporary diversions, necessary barricades, warning signs / lights, and road signs. • Provide signs at strategic locations of the roads complying with the schedules of signs contained in the Pakistan 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 local language:

		○ Location: chainage and village name ○ Duration of the construction period ○ Period of proposed detour / alternative route ○ Suggested detour route map ○ Name and contact address/telephone number of the concerned personnel ○ Name and contact address / telephone number of the Contractor ○ Inconvenience is sincerely regretted.
	Accidents and spillage of fuels and chemicals	• Restrict truck deliveries, where practicable, to daytime working hours (7 am to 6 pm). • Restrict the transport of oversize loads. • Operate road traffics/transport vehicles, if possible, to non-peak periods to minimize traffic disruptions. • Enforce on-site speed limit

ECP 16: Labor Influx Management and Construction Camp Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Siting and Location of construction camps	Campsites for construction workers are the important locations that have significant impacts such as health and safety hazards on local resources and infrastructure of nearby communities.	The Contractor shall • Prepare a management plan for construction of workers camp in accordance with IFC Guidance on Workers Accommodation and submit the plan for supervision consultant's approval. • Locate the construction camps within the designed sites or at areas that are acceptable from environmental, cultural or social point of view; and approved by the supervision consultant. • 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 the supervision consultant for approval a detailed layout plan for the development of the construction camp 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. • Local authorities responsible for health, religious and security shall be duly informed on the set up of camp facilities so as to maintain effective surveillance over public health, social and security matters.
Construction Camp Facilities	Lack of proper infrastructure facilities ,	Contractor shall provide the following facilities in the campsites

	such as housing, water supply and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards.	• Adequate accommodation, transportation, and basic services including water, sanitation, and medical care for the workers working on that project Safe and reliable water supply, which should meet NEQS. Drinking water to be chlorinated at source and ensure presence of residual chlorine 0.1 ~ 0.25 ppm as a minimum after 30 minutes of chlorine contact time (WHO guideline). • Hygienic sanitary facilities and sewerage systems. The toilets and domestic wastewater will be collected through common sewerage. Provide separate latrines and bathing places for males and females with total isolation by location. The minimum number of toilet facilities required is one toilet for every ten persons. • Treatment facilities for sewerage of toilet and domestic wastes. • Stormwater drainage facilities. • Paved internal roads. • Provide child crèches for women working construction sites. The crèche should have facilities for dormitory, kitchen, indoor and outdoor play area. Schools should be attached to these crèches so that children are not deprived of education whose mothers are construction workers. • Provide in-house community/common entertainment facilities. Dependence of local entertainment outlets by the construction camps to be discouraged/prohibited to the extent possible.
Workers Accommodation	All workers in the camp should have adequate accommodation facilities	The Contractor shall provide the following: • The labor will be provided with accommodation on twin sharing basis made of insulating material and locally available building material, etc.; • The migrant workers with families shall be provided with individual accommodation comprising a bedroom, sanitary and cooking facilities; • The units will be supported by common latrines and bathing facilities duly segregated for male and female labor; • An adequate number of toilets shall be provided in the accommodation facilities. A minimum of 1 unit to 15 males and 1 unit for 10 females shall be provided; • The contractor shall provide a kitchen facility for the construction workers and the food will be of appropriate nutritional value and will consider religious/cultural backgrounds; • All doors and windows shall be lockable and mobile partitions/curtains shall be provided for privacy; • Facilities for the storage of personal belongings for workers shall be provided within the campsite only; • Dustbins shall be provided for collection of garbage and will be removed on a daily basis;

		• It is also required to provide first aid box in adequate numbers; and • Ventilation should be appropriate for the climatic conditions and provide workers with a comfortable and healthy environment to rest and spend their spare time.
Disposal of waste	Management of wastes is crucial to minimize impacts on the environment	The Contractor shall • Ensure proper collection and disposal of solid wastes within the construction camps • Insist waste separation by source; organic wastes in one pot and inorganic wastes in another pot 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 with the manpower and equipment/vehicles needed. • Dispose of organic wastes in a designated safe place on 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, are not attracted. One may dig a large hole to put organic wastes in it; take care to protect groundwater from contamination by leachate formed due to decomposition of wastes. Cover the bed of the pit with impervious layer of materials (clayey or thin concrete) to protect groundwater from contamination. • Locate the garbage pit/waste disposal site min 500 m away from the residence so that peoples are not disturbed with the odor likely to be produced from anaerobic decomposition of wastes at the waste dumping places. Encompass the waste dumping place by fencing and tree plantation to prevent children from entering and playing with. • Do not establish site-specific landfill sites. All solid waste will be collected and removed from the work camps and disposed in approval waste disposal sites.
Fuel supplies for cooking purposes	Illegal sourcing of fuelwood by construction workers will impact the natural flora and fauna	The Contractor shall • Provide fuel to the construction camps for their domestic purpose, in order to discourage them from using fuelwood or another biomass. • Made available alternative fuels like natural gas or kerosene on ration to the workforce to prevent them from using biomass for cooking. • Conduct awareness campaigns to educate workers on preserving the protecting the biodiversity and wildlife of the project area, and relevant government regulations and punishments on 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.	The Contractor shall • Provide adequate health care facilities within construction sites. • Provide first aid facility round the clock. Maintain stock of medicines in the facility and appoint full-time designated first aider or nurse. • Provide ambulance facility for the laborers during an emergency to be transported to nearest hospitals. • Initial health screening of the laborers coming from outside areas • Inspect all camp facilities regularly to ensure o Daily sweeping of rooms and houses shall be undertaken; o Regular cleaning of sanitary facilities shall be undertaken; o The kitchen and canteen premises shall be established under good hygiene conditions; o Daily mealtimes shall be fixed for the labor; o Smoking and alcohol consumption shall be prohibited in the workplace; o Waterlogging shall be prevented at areas near the accommodation facilities and adequate drainage is to be provided; and o Checklists pertaining to the daily housekeeping schedule shall be maintained and displayed at houses, toilets and kitchen. • 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 • Complement educational interventions with easy access to condoms at campsites as well as voluntary counseling and testing • Provide adequate drainage facilities throughout the camps to ensure that disease vectors such as stagnant water bodies and puddles do not form. Regular mosquito repellant sprays during monsoon. • Carryout short training sessions on best hygiene practices to be mandatorily participated by all workers. Place display boards at strategic locations within the camps containing messages on best hygienic practices
Safety	Inadequate safety facilities to the construction camps may create security problems and fire hazards	The Contractor shall • Provide appropriate security personnel (police / home guard or private security guards) and enclosures to prevent unauthorized entry into the camp area. • Maintain register to keep a track on a headcount of persons present in the camp at any given time.

		• Encourage the use of flameproof material for the construction of labor housing / site office. Also, ensure that these houses/rooms are of sound construction and capable of withstanding windstorms/cyclones. • Provide the appropriate type of firefighting equipment suitable for the construction camps • Display emergency contact numbers clearly and prominently at strategic places in camps. • Communicate the roles and responsibilities of laborers in case of an emergency in the monthly meetings with contractors.
Site Restoration	Restoration of the construction camps to the original condition requires demolition of construction camps.	The Contractor shall • 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. • Dismantle camps in phases and as the work gets decreased and not wait for the entire work to be completed • Give prior notice to the laborers before demolishing their camps/units • Reuse the demolition debris to a maximum extent. Dispose of remaining debris at the designated waste disposal site. • Handover the construction camps with all built facilities as it is if agreement between both parties (contractor and landowner) has been made so. • Restore the site to its condition prior to commencement of the works or to an agreed condition with the landowner. • Not make false promises to the laborers for future employment in O&M of the project.

ECP 17: Socio-cultural and Religious Issues

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities near residential areas	Disturbance from construction activities (dust, noise, traffic, conflicts with contractor's workforce etc.)	The Contractor shall • Establish a system for receiving complaints from the community and address them (the community can also make complaints to the GRM established under the project) • Shall ensure all the construction workers follows the following code of conduct: • All workers are strictly forbidden to establish any kind of relationship with local women brings any un-related women to the project site. • All workers should avoid sexual harassment and child abuse.

		• All workers must not leave the camps or work sites unless written authorization is issued by the respective supervisor • The contractors will advise and prohibit the local population and its authorities or representatives not to enter the project operation areas (campsites, colonies, etc.) in order to minimize the potential risk of incidents related to the operations.
Construction activities near-religious and cultural sites	Disturbance from construction works to the cultural and religious sites, and contractors' lack of knowledge on cultural issues cause social disturbances.	The Contractor shall • Communicate to the public through community consultation and newspaper announcements regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restriction. • Do not block access to cultural and religious sites, wherever possible • Restrict all construction activities within the footprints of the construction sites. • Stop construction works that produce noise (particularly during prayer time) shall there be any mosque/religious/educational institutions close to the construction sites and users make objections. • Take special care and use appropriate equipment when working next to a cultural/religious institution. • Stop work immediately and notify the site manager if, during construction, an archaeological or burial site is discovered. It is an offence to recommence work in the vicinity of the site until approval to continue is given by the CSC/PMU. • Provide separate prayer facilities to the construction workers. • Show appropriate behavior with all construction workers especially women and elderly people • Allow the workers to participate in praying during construction time • Resolve cultural issues in consultation with local leaders and supervision consultants • Establish a mechanism that allows local people to raise grievances arising from the construction process. • Inform the local authorities responsible for health, religious and security duly informed before commencement of civil works so as to maintain effective surveillance over public health, social and security matters

ECP 18: Worker Health and Safety

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Best practices	Construction works may pose health and safety	The Contractor shall

	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 shall 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 standards applicable in US/UK/Australia/or any other developed country can also be used. • 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 ones and replacing them with the damaged ones. • 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 duly informed before commencement of civil works and establishment of construction camps so as to maintain effective surveillance over public health, social and security matters
	Child and pregnant labor	The Contractor shall • not hire children of less than 18 years of age and pregnant women or women who delivered a child within 8 preceding weeks, in accordance with the National Labor Laws
Accidents	Lack of first aid facilities and health care facilities in the immediate vicinity will aggravate the health conditions of the victims	• Provide health care facilities and first aid facilities are readily available. Appropriately equipped first-aid stations shall be easily accessible throughout the place of work • 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 and along the roads
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 living standards and health hazards.	The Contractor shall provide the following facilities in the campsites to improve health and hygienic conditions as mentioned in ECP 15 • Adequate ventilation facilities • Safe and reliable water supply. • Hygienic sanitary facilities and sewerage systems. The toilets and domestic wastewater will be collected through common sewerage. • Treatment facilities for sewerage of toilet and domestic wastes • Stormwater drainage facilities. • Recreational and social facilities • Safe storage facilities for petroleum and other chemicals in accordance with ECP 2 • Solid waste collection and disposal system in accordance with ECP1. • Arrangement for trainings • Paved internal roads. • Security fence at least 2 m 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 portable toilets at the construction sites, if about 25 people are working the whole day for a month. The location of portable facilities shall be at least 6 m away from the storm drain system and surface waters. These portable toilets shall be cleaned once a day and all the sewerage shall be pumped from the collection tank once a day and shall be brought to the common septic tank for further treatment. The contractor shall provide bottled drinking water facilities to the construction workers at all the construction sites.
Other ECPs	Potential risks on health and hygiene of construction workers and general public	The Contractor shall follow the following ECPs to reduce health risks to the construction workers and nearby community ECP 2: Fuels and Hazardous Goods Management ECP 4: Drainage Management ECP 10: Air Quality Management ECP 11: Noise and Vibration Management ECP 14: Road Transport and Road Traffic Management
Trainings	Lack of awareness and basic knowledge in health care among the construction workforce, make them susceptible to potential diseases.	The Contractor shall • 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 shall 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 before the start of the construction phase and complement it with a strong condom marketing, increased access to condoms in the area as well as to voluntary counseling and testing. • 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 ongoing and regular basis. This shall be complemented by easy access to condoms at the workplace as well as to voluntary counseling and testing.

ECP 19: Tunneling and Underground Construction Works

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Ventilation	Poor ventilation results in oxygen depletion and exposure to excessive heat and fumes, which can lead to acute or long-term health problems;	The Contractor shall • follow Specifications on Ventilation and Lighting for Underground Works of the International tunneling associations.
Atmospheric pollution	Release of toxic gases, fumes and vapors	The Contractor shall follow Technical Specifications on Ventilation and Lighting for Underground Works
	Release of dust and silica. Long-term exposure to respirable dust can lead to diseases ranging from bronchitis to cancer. Even if the dust is not at harmful levels it can cause irritation to the eyes and throat and increase the risk of physical injury due to poor visibility	The Contractor shall • Identify possible sources of the generation of dust in a tunnel and control measures implemented to eliminate or minimize, so far as is reasonably practicable, the generation of the dust at the source. • Maintain extraction at or close to the point of • Use extractors or dust collection devices in-line near the face • Increase ventilation capacity by increasing the extraction rate when and where needed • Use wet spraying to suppress dust at the point of generation e.g. conveyors, spoil heaps after blasting, while loading and on roadways • providing PPE like respirators rated for the concentration and duration of exposure
Work Place Facilities	All underground workers should have access to adequate water and sanitation facilities	The Contractor shall • Provide adequate facilities for workers including toilets, drinking water, washing facilities and eating facilities • Ensure the facilities are maintained in good working order, clean, safe and accessible

		• Ensure the eating facilities (crib rooms) should be away from dusty environments • Ensure regular collection and disposal of solid waste and other construction waste from underground areas.
Heat Stress	Heat stress causes tiredness, irritability, light-headedness, muscular cramps, etc.	The Contractor shall • Regulate the airflow or modifying ventilation to ensure cooling • Reduce items of heat-producing equipment in the tunnel • Provide extra ventilation fans to create air flows in low-flow areas • Provide cool drinking water
	Fire and explosion	The Contractor shall • Conduct fueling in designated fueling bays • Eliminate ignition sources underground where practicable • Isolate fuel sources from remaining ignition sources • Remove potential fuel sources from the work area • Store only necessary fuel underground • Implement firefighting training and procedures • Ensure the availability of firefighting resources • Restrict smoking to designated areas
	Collisions with moving plant (vehicle and equipment)	The contractor shall • plan pedestrian movements are separated from vehicle movements • providing lighting for safe movement • provide a system to warn workers when the plant is reversing or special loads like explosives are being moved
Emergency Response	Emergency Plan	The Contractor shall prepare an emergency response plan with • emergency procedures including • an effective response to an emergency • evacuation procedures • notifying emergency service organisations at the earliest opportunity • effective communication between the person authorised by the person conducting the business or undertaking to co-ordinate the emergency response and people at the workplace • testing emergency procedures including the frequency of testing, and • Information, training and instruction to relevant workers about implementing the emergency procedures
	Check-in/check-out procedures	The Control shall • Maintain a check-in/check-out procedure to ensure that the above-ground personnel maintain an accurate accounting of the number of persons underground and

		to prevent unauthorized persons from gaining access to the site. This is especially important in the event of an emergency but is a commonsense requirement at all times. • Any time an employee is working underground, at least one designated person must be on duty above ground. This person is responsible for calling for immediate assistance and keeping an accurate count of employees who remain underground in the event of an emergency.
	Communication system	The contractor shall establish a communication system throughout the construction site to pass the information and instructions, the monitoring of systems and the control of operations such as lifting; transporting persons, materials and plants; coordinating maintenance and managing emergencies.

ECP 20: Instream Construction Works (Diversion, Coffer Dam and Dam Construction)

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
General Construction Works	River water quality and aquatic habitat due to risk of release of deleterious substances into the river	The Contractor shall • Prevent the release of silt, sediment, sediment-laden water, raw concrete, concrete leachate, or any other deleterious substances into the River. • Ensure equipment and machinery are in good operating condition (power washed), free of leaks, excess oil and lubricants, and grease. • Machinery leaking fuel, lubricants, hydraulic fluids or solvents shall not work within the river. • Keep a spill containment kit readily accessible onsite in the event of a release of a deleterious substance to the environment. Train onsite staff in its use.
	Stranding of fish in the dewatered area	The Contractor shall • Complete fish salvage before the start of works from the dewatered portion of the river using appropriate techniques.
	Risk of safety relative to river work	The Contractor shall • Devise an evacuation plan, including installation of warning signals and emergency exits, to safely evacuate employees and equipment from the work area. • Ensure risk management procedures are in place on all work sites to minimise the potential for damage arising from inclement weather and/or/elevated river levels during the course of work.
Excavation Works	.	The Contractor shall • Remove excavated material and dispose of it into the designated disposal areas, not dumping these materials into the river. Use mitigating measures to protect

		excavated material from being eroded and reintroduced into the river
Concrete Works	Concrete leachate is alkaline and highly toxic to fish and other aquatic life.	The Contractor shall • Provide appropriate devices and measures against the discharge of toxic materials and fluids originated from concreting work into the rivers, • Ensure that any materials or liquids produced by works involving the use of concrete, cement and cementitious materials shall not be deposited at non-designated places, and not be discharged into or about any watercourse without treatment. • Provide containment facilities for the wash-down water from concrete delivery trucks, concrete pumping equipment, and other tools and equipment.

Annex 2: Environmental Screening Checklist[8]

INSTRUCTIONS

This checklist is designed to help users decide whether EIA is required based on the characteristics of a project and its environment.

Start by providing a brief description of the project.

Then using available information about the project answer each question in Column 2:

- Yes - if the answer is yes
- No - if the answer is no
- ? - if the answer is don't know

Briefly describe the relevant characteristic of the project or its environment and then consider whether any effect that is likely to result is likely to be significant and enter the response in Column 3 with a note of the reasons why. Use the next Checklist on Criteria for Evaluating Significance to help answer the question "Is this likely to result in a significant effect?".

Some examples illustrating how to use the checklist are given below.

Questions to be Considered	Yes / No / ? . Briefly describe	Is this likely to result in a significant effect? Yes/No/? - Why?
Brief Project Description: Development of 500 houses adjacent to an existing rural settlement at ABCville.		
1. Will construction, operation or decommissioning of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in waterbodies, etc)?	Yes. The project will involve development of a large site currently in agricultural use and crossed by a small river.	Yes. Loss of agricultural land and diversion of river
3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?	No except in the small amounts typically used by householders	No
4. Will the Project produce solid wastes during construction or operation or decommissioning?	Yes. Construction will require excavation of a small hill and transport and disposal or re-use of a large quantity of spoil.	Yes. Transport could have significant impact on neighbouring village
9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?	No. The existing village was mainly built in the 1950s.	No
10. Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?	Yes. The project will require extension of the village sewage works which is already overloaded.	Yes. There is not much space to extend the works and it already causes odour problems in the village

[8] The screening checklist is developed by European Commission and is available at http://ec.europa.eu/environment/archives/eia/eia-guidelines/g-screening-full-text.pdf

19. Are there any areas or features of historic or cultural importance on or around the location which could be affected by the project?	? No information available about the area	? requires further investigation

THE SCREENING CHECKLIST

Screening Questions	**Yes / No /?. Briefly describe**	**Is this likely to result in a significant effect? Yes/No/? – Why?**
1. Will construction, operation or decommissioning of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)?		
2. Will construction or operation of the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?		
3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?		
4. Will the Project produce solid wastes during construction or operation or decommissioning?		
5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air?		
6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?		
7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater, coastal wasters or the sea?		
8. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?		
9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?		
10. Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?		
11. Are there any areas on or around the location which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project?		
12. Are there any other areas on or around the location which are important or sensitive for reasons of their ecology e.g. wetlands, watercourses or other waterbodies, the coastal zone, mountains, forests or woodlands, which could be affected by the project?		
13. Are there any areas on or around the location which are used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the project?		

Screening Questions	Yes / No /?. Briefly describe	Is this likely to result in a significant effect? Yes/No/? – Why?
14. Are there any inland, coastal, marine or underground waters on or around the location which could be affected by the project?		
15. Are there any areas or features of high landscape or scenic value on or around the location which could be affected by the project?		
16. Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?		
17. Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected by the project?		
18. Is the project in a location where it is likely to be highly visible to many people?		
19. Are there any areas or features of historic or cultural importance on or around the location which could be affected by the project?		
20. Is the project located in a previously undeveloped area where there will be loss of greenfield land?		
21. Are there existing land uses on or around the location e.g. homes, gardens, other private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining or quarrying which could be affected by the project?		
22. Are there any plans for future land uses on or around the location which could be affected by the project?		
23. Are there any areas on or around the location which are densely populated or built-up, which could be affected by the project?		
24. Are there any areas on or around the location which are occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities, which could be affected by the project?		
25. Are there any areas on or around the location which contain important, high quality or scarce resources e.g. groundwater, surface waters, forestry, agriculture, fisheries, tourism, minerals, which could be affected by the project?		
26. Are there any areas on or around the location which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?		
27. Is the project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?		
28.Will pesticides, rodenticides or any other vector control products will be used during any stage of project implementation and operation?		

Annex 3: Terms of Reference for the ESIA

A. Project Area and Potential Environment and Social Issues

About two to three run-of-river hydropower projects will be developed under Khyber Pakhtunkhwa Hydropower and Renewable Energy Development Programs. Initially two projects are identified on the Panjkora River in Upper Dir district.

The topography of the Upper Dir district is dominated by high-altitude mountains of Hindukush ranging from 6,000 meters in the north to 2,000 meters in the south-west. Coniferous forests are found in western part of the district and the eastern mountains are barren but have the potential to develop artificial / man-made forests. This district wildlife includes Chakor partridge, Maina, Duck, Leopard and Jackal and during snow season the Markhor use to migrate from Chitral to Dir Kohistan in search of food. As the District does not have a wildlife reserve or protected area therefore some of the above-mentioned wildlife species are posed to potential threat of illegal hunting. There is also an opportunity to introduce trophy hunting like in Gilgit Baltistan to develop sport, income generation and to provide protection to these species.

Upper Dir is one of the 26 districts of Khyber Pakhtunkhwa. At the time of independence, Dir (princely state) was ruled by Nawab Shah Jehan Khan. It was merged with Pakistan in 1969 and declared as a district in 1970. In 1996, it was bifurcated into Upper and Lower Dir districts. This district is situated in the northern part of Pakistan. It borders the Chitral district and Afghanistan on the north and northwest and Swat district to the east, and on the south by Lower Dir District.

Upper Dir district has a population of 0.95 million with a population density of 263.9 /km² (2017 census-provisional results). 50.7 % of the population is male and 49.3 % is female. According to the 2017 census estimates, about 95% of the population lives in rural areas. Except for Dir and a number of rapidly growing bazaar towns along the main roads, the population is rural, scattered in more than 1200 villages in the deep narrow valleys of the Panjkora and its tributaries. Of these, notable villages are Khas Dir, Barawal, Gandigar, Khall, Darorra, Ganori, Shalkani, Bibyawar and Wari. The district is administratively subdivided into three tehsils including Dir, Sheringal and Wari which contain a total of 37 Union Councils.

Potential projected impacts include issues related to river ecology, connectivity and alteration of downstream flows, restriction of fish migration or change in fish habitat, cutting of trees, land acquisition, resettlement and loss of livelihoods. community health and safety and labor and gender-related issues. Construction-related impacts will include drilling, blasting, transportation and dumping resulting emission of Particulate Matters (PM), fugitive dust, noise, generation, vibration, the release of effluents, impacts on physical cultural resources and aesthetic environment, blasting activities can affect workers', animals and to a lesser extent, communities. Blasting procedures will take into account the villages as sensitive receptors, trees cutting for clearance of transmission lines, electromagnetic radiation (from transmission line), community infrastructure resettlement, crop damage and compensation under transmission line. Traffic constraints and road relocation due to possible inundation have the highest potential to create a nuisance for community members. Potential impacts during operation and maintenance activities include changes in river flows, potential changes in water use, ecology in the pond area and its impact on fish habitat, waste generation from repair and maintenance of power plant, offices and residential facilities, safety hazards caused by power generation facility as well as transmission lines, and electromagnetic radiation from transmission lines.

A- Scope of Work

Pakhtunkhwa Energy Development Organization (PEDO) intends to engage a team of individual consultants to jointly conduct the Environmental and Social Impact Assessment (ESIA) including an Environmental Management Plan (ESMP) of the proposed two to three hydropower projects (tentatively two projects are identified, which are Kaklot-Barikot-Patrak and Patrak-Shringal Hydropower Projects), in order to ensure that the activities carried out under the proposed project are (i) environmentally sound and sustainable in the long run and (ii) consistent with the environmental safeguard guidelines, rules and regulations of the Government of Pakistan, as well as those of the World Bank.

The Proposed Consultants will carry out the tasks including, but not limited to the following:

(i) Review available / secondary environmental data, baseline studies, and results of scoping sessions and also take into account the legal and administrative framework and national policies in the country and detailed safeguard policies of the World Bank on the environment, natural habitats, physical and cultural resources and public disclosure of information.

(ii) Carry out detailed survey and investigations for collection of adequate primary baseline data especially related to biodiversity. (The initial field reconnaissance will determine the level of effort needed for these surveys.) .

(iii) Collect primary data on the biophysical environment of the project area with a focus on both terrestrial and aquatic ecology

(iv) Collect primary data on the socioeconomic conditions of the local communities

(v) Work with the PEDO and its engineering consultants in carrying out an alternative analysis of the proposed project alignments and designs.

(vi) Assess all potential environmental direct and indirect impacts of the project during pre-construction, construction and operation phases in the project area of influence.

(vii) Provide an independent opinion on approach and adequacy to integrate appropriate environmental management measures with related costs into the detailed design, specifications and project contract documents.

(viii) Undertake two stages of public consultation as per World Bank policy requirements for category A projects. Participate in the consultations carried out by the client/Design Consultants. Conduct additional consultations as needed.

(ix) Recommend institutional and capacity building measures for PEDO to identify, manage, and eventually mainstream environmental aspects of the project activities through the entire project cycle - conceptualization, preparation, implementation and operation.

(x) Provide support and advice to PEDO in all matters relating to the environmental aspects of the project.

(xi) Maintain communication, when necessary, with the WB TTL and the WB safeguards specialist to ensure mutual understanding in terms of quality and expectations.

(xii) Conduct Public Hearing and Presentation as per the directive of EPA for issuance of Environmental Approval (EA)/NOC for construction of the project.

(xiii) Propose strategies for the development of eco-tourism in the area.

(xiv) Any additional work required to achieve the objective of the assignment.

The Independent Environment Consultant should regularly coordinate his/her activities with the GKH Consultants and actively inform himself/herself of the results. Results of the technical design studies and the parallel ESIA should be integrated to make the final choice of the best scheme layout for each project. The design of the project features would take into account environmental and social impacts, and the cost estimate and proposed implementation plan should take into account for implementing the Environmental and Social Management Plans, RAPs covering the resettlement, compensation and livelihood improvement programs for the affected people Preparation of the ESIA report as per Pakhtunkhwa Environmental Protection Act guidelines of EPA.

The consultant's services and output will be reviewed by an Independent Panel of Experts (IPOE)/Advisor's Committee assigned by PEDO. The IPOE/Committee will include experts who will review main draft reports and give professional advice on all matters concerning project design, construction, bid documents, contract management and safeguards. The consultant should respond to IPOE/Committee's comments and recommendations, incorporate these in the final reports, or clearly motivate if not following the recommendations. The ESIA and ESMF will also be subject to review and approval by the WB safeguard specialists.

Scope of Work is divided into the following main deliverables.

1. Environment and Social Impact Assessment of Kalkot-Barikot-Patrak and Patrak-Shringal Hydropower Projects. It is expected that the draft ESIA will be submitted to PEDO within six months of the contract signing.
2. Preparation of the EIA report as per World Bank Policy requirements and Pakhtunkhwa Environmental Protection Act guidelines of EPA and as per Table of Contents mentioned in Annex A.
3. Cumulative Impact Assessment. It is expected that the CIA report will be submitted to PEDO within six months of the contract signing.
4. All of the above reports will be subject to the Bank's review and approval.

Duration of Assignment

The assignment will be for a total of 6 months (intermittent input) over a period of one year. However, most of the work is expected to be completed in the first six months. The consultant will coordinate his/her activities with PEDO and the social development consultant.

Consultant's Team and Qualifications

The Consultant's team will include experts in the environment, social and resettlement, aquatic and terrestrial ecology. Each Consultant should have a master's degree in their relevant fields. He/she shall have at least fifteen years of relevant work experience in environmental and social impact assessment and mitigation including experience related to hydroelectric projects. Experience in similar assignments, especially category A projects in the region would be highly preferred. The consultants should have experience working for the WB financed projects and familiar with World Bank operations procedure for investment lending especially its safeguards policies.

Annex A -Table of Contents for the Safeguard Instruments

Environment and Social Impact Assessment.

The ESIA will cover all components of the proposed subprojects - including weir, headrace tunnel, sand trap, pressure tunnel, surge shaft, penstock, powerhouse, tailrace, transmission line, offices, and

residential area; and all phases of the project - including design, construction, and operation and maintenance of the facilities. To achieve the broad aim of ensuring safeguards' analysis, the consultant will:

Review the Project details

Review the proposed project and its geographic, ecological, social, and temporal context, including any offsite investments that may be required. Identify the need for any resettlement plans.

Define the Impact Area and the Corridor of Influence of the project on the basis of the project scope and extent. The definition of area of influence should be in accordance with the WB EA policy (OP4.01) which includes all its ancillary aspects, such as power transmission corridors, pipelines, canals, tunnels, relocation and access roads, borrow and disposal areas, and construction camps, as well as unplanned developments induced by the project (e.g., spontaneous settlement, logging, or shifting agriculture along access roads).

Review of the Legislative and Regulatory Framework

Review the policy, legal, and administrative framework within which the ESIA is carried out. Review the national and provincial environmental requirements for EIA. Indicate relevant international environmental agreements to which the country is a party. Also review the WB OPs (Annex B) and their triggering status for the Project and state the actions taken/planned in response to each OP triggered.

Scoping

Scoping is the first step of the ESIA and will help in identifying the significant issues relating to the proposed actions and of determining the scope of the issues to be addressed in the ESIA. The key tasks include: i) carry out reconnaissance field visit(s); ii) hold initial stakeholder consultations; iii) identify the key aspects to be studied during the detailed ESIA, iv) consultation on ESIA ToRs with the stakeholders; v) prepare work plan for the subsequent ESIA tasks; and vi) prepare the Scoping Statement compiling the process and outcome of the scoping tasks described above and Vii) Preparation of the EIA report as per Pakhtunkhwa Environmental Protection Act guidelines of EPA and requirements laid out in Annex A.

Review the definition of Area of Impact and the Corridor of Influence and revise if necessary.

Analysis of Alternatives

Systematically compare feasible alternatives to the proposed project site, technology, design, and operation--including the "without project" situation--in terms of their potential environmental and social impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. For each of the alternatives, quantify the environmental and social impacts to the extent possible, and attaches economic values where feasible. State the basis for selecting the particular project design proposed and justifies recommended emission levels and approaches to pollution prevention and abatement.

Detailed Baselines Studies and Analysis

Assess the dimensions of the study area and review relevant physical, biological, and socioeconomic conditions, including any changes anticipated before the project commencement. Study current and proposed development activities within the project area but not directly connected to the project. Also analyze the trends in the key environmental and social parameters of the area. Data should be relevant to decisions about project location, design, and operation.

Collect secondary and primary data on the following aspects:

Physical Environment (physiography, climate, geology and seismology, soils, hydrology, groundwater, flooding, sedimentation, water quality, air quality, noise, and others)

Biological Environment (Forests; natural vegetation i.e. trees, shrubs, herbs, scrub, grasses, medicinal plants, and others; fauna i.e. mammals, birds including migratory birds, reptiles, amphibians, insects, fish and red-listed species; biodiversity including carrying capacity; protected and non-protected areas including hunting, poaching, illegal fishing; wetlands; fish; benthic flora and fauna; and others)

Social Environment (population and demography; land use and natural resources including agriculture, livestock, grazing, forestry; land tenure system; occupations structure; income and expenditure ratio; economic activities e.g. quarrying of minerals, tourism, fisheries, trade, services; social infrastructure and services including education, health, communications, others; vehicular traffic particularly used for commercial activities i; access, law and order and security situation; community organizations; vulnerable groups and poverty situation; gender aspects; recreation areas/potential; cultural heritage; archaeology; objects of special interest, e.g. graveyards and monuments; and others)

Stakeholder Consultations

The identification of stakeholders potentially affected by or interested in a hydropower scheme development should take into account the different project stages:

- planning and design
- construction or rehabilitation period
- operation
- emergency situations.

There may be different stakeholder groups at different stages of the project. It should also be understood that the stakeholders may not all be proximal to the project, and this should be included in the assessment and stakeholder mapping. Users of the water body affected may include tourists or recreational users (for fishing, swimming, boating) who live remotely. The Stakeholder Engagement Plan (SEP) should identify relevant stakeholder groups and clarify how communication will be undertaken.

Continuing the consultation process initiated during the scoping phase, hold following two additional rounds of consultations.

- During ESIA study. Conduct interagency and consultation meetings, including consultations for obtaining the informed views of the affected people, local nongovernmental organizations (NGOs) and other stakeholders. Hold consultative workshops at the site, in District HQs, and Peshawar.
- Hold consultations after preparing draft ESIA report (during Public Hearing) – with grass-root as well as institutional stakeholders.

Impact Assessment

Predict and assess the project's likely positive and negative impacts, in quantitative terms to the extent possible, associated with Project site, design, technology, construction, and operation. Determine various characteristics of the potential impacts including spatial and GPS Mapping extent (local, regional, global), nature (direct/indirect), temporal extent (temporary, permanent), reversibility, severity, and sensitivity of receptors. Based on this, characterize the significance of each impact. Identify mitigation measures and any residual negative impacts that cannot be mitigated, and also the significance of the residual impacts. Assess the Project with reference to the national regulatory requirements (e.g. NEQS, as per Khyber

Pakhtunkhwa Environmental Protection Act Standards) and WB OPs (forestry, natural habitat, safety of dam, involuntary resettlement, projects on international waters, physical cultural resources, and others - see list of OPs at the end of this document). Also assess the induced impacts of the Project on upstream and downstream areas. Incorporate 'lessons learned' from the other Bank-financed hydroelectric projects in the Country (e.g., Tarbela 4th Extension and Dasu HPP).

Determine ecological flow requirements. Relevant guidance for E-Flows assessment should be followed and it can be found in WB Group GOOD PRACTICE HANDBOOK Environmental Flows for Hydropower Projects (2018): https://www.ifc.org/wps/wcm/connect/2c27d3d8-fd5d-4cff-810f-c6eaa9ead5f7/GPH_Eflows+for+Hydropower+Projects_Updated_compressed.pdf?MOD=AJPERES.

Explore opportunities for environmental enhancement and provide their cost of implementation.

Environmental and Social Management Plan (ESMP)

Prepare ESMP complete with mitigation plan, compliance monitoring plan, effects monitoring plan and construction camp management plan including labor influx management plan, gender management plan, institutional arrangements for implementation and monitoring, training needs, documentation and communication protocol, grievance redress mechanism, cost of implementing ESMP, and mechanism to integrate ESMP with the Project (e.g., through contractual clauses).

An elaborate multi-tier Grievance Redress Mechanism (GRM) should be an integral part of the ESMP.

An environmental and social management plan should be prepared in such a way that the maximum items in mitigation and monitoring plan can be later incorporated in the bidding document as part of the "Bill of Quantities" (BOQ).

The ESMP will include an OHS plan to address risks and mitigation measures during construction, commissioning, operation and decommissioning of HPPs. While these risks are similar to those at other large infrastructure activities, some are of particular concern during construction and operation of hydropower projects such as tunneling and the use of explosives. (The following literature provides guidance on environmental, health and safety aspects, on hydropower projects: IFC GOOD PRACTICE NOTE Environmental, Health, and Safety Approaches for Hydropower Projects (2017): https://www.ifc.org/wps/wcm/connect/cefc36ec-9916-4ec4-b5ac-1d99602a3ef3/GPN_EHSHydropower.pdf?MOD=AJPERES).

The ESMP should also cover emergency preparedness and response plan.

The ESMP should follow the WBG EHS Labor Influx, GBV/SEA Guidelines.

B- Staff and Qualifications

A team of independent consultants will be hired to carry out the studies. The key staff and their qualification requirements are given in the following table.

S.No.	Key Staff	Man-months	Qualifications
1	Team Leader and Environmental Specialist	8	An international specialist with a master's degree in environmental sciences, Environmental Management or similar fields. He/she shall have at least fifteen years of relevant work experience in environmental and social impact assessment and mitigation including experience related to hydroelectric projects. Experience in similar assignments, especially category A projects in the region would be highly preferred. The candidate should have experience working for the WB financed projects and familiar with World Bank

S.No.	Key Staff	Man-months	Qualifications
			operations procedure for investment lending especially its safeguards policies.
2	Social Specialist	8	The Consultant should have a master's degree in social sciences, social development or similar fields. He/she shall have at least fifteen years of relevant work experience in social impact assessment and mitigation as well as in resettlement planning. Experience in similar assignments, especially category A projects are highly preferred. The candidate should have experience working for the WB financed projects and familiar with World Bank operations procedure for investment lending especially its safeguards policies.
3	Terrestrial Ecologist	6	The Consultant should have a master's degree in ecological sciences or similar fields. He/she shall have at least ten years of relevant work experience in carrying out the baseline studies on flora and fauna. Experience in similar assignments, especially in development projects funded by international financial institutions are highly preferred.
4	Aquatic Ecologist	6	The Consultant should have a master's degree in ecological sciences or similar fields. He/she shall have at least fifteen years of relevant work experience in carrying out aquatic ecological studies. Experience in similar assignments, especially in development projects funded by international financial institutions are highly preferred.
5	Environmental Specialist	6	The Consultant should have a master's degree in Environmental Sciences, Environmental Management or similar fields. He/she shall have at least five years of relevant work experience in environmental and social impact assessment and mitigation including experience related to hydroelectric projects. Experience in similar assignments, especially category A projects would be highly preferred.
6	Gender and Communications Specialist	6	The Consultant should have a master's degree in social sciences, social development or similar fields. He/she shall have at least ten years of relevant work experience in gender assessment and community consultations. Experience in similar assignments, especially category A projects are highly preferred.
7	GIS Specialist	7	The Consultant should have a bachelors degree or engineering with at least five years of experience in GIS analysis and preparation of maps.

Annex 4: Table of Contents of ESIA

ABBREVIATIONS AND GLOSSARY

Executive Summary

Concisely discusses significant findings and recommended actions including a summary Table of ESMP.

1. Introduction

    1.1 Overview

    1.2 Background of the project

    1.3 Objective of ESIA

    1.4 Approach to work

    1.5 Project Impact Area and Corridor of Influence

    1.6 Composition of the study team

2. The legal and administrative framework

2.1 GoP/ Khyber Pakhtunkhwa requirements (legislation; guidelines and rules; policies; international treaties signed by Pakistan; national and provincial authorities; environmental procedures), their applicability, and compliance status for the Project.

2.2 World Bank requirements (Operational Policies and safeguard requirements; and WBG Environmental Health and Safety guidelines) and their triggering and compliance status for the Project.

3. Project description

3.1 Need and purpose of the project

3.2 Project location

3.3 Salient features

3.4 The project description that includes a technical description and schedule of the planned development stages, typically:

- underground (such as tunnels, underground electromechanical equipment) and on-land works (all works that are undertaken before the river closure)
- river works: cofferdams, river diversions, river closures and dams
- reservoir filling
- operation details such as drawdown of the reservoir, operating hierarchy (if multipurpose) and operating regime throughout the year and on a monthly, daily and/or hourly basis.

The project description should include details of both the construction stages and the operation mode of the hydropower scheme, including seasonal flow regulation or peak energy production.

Description of project components (intake structures; tunnels and penstock arrangements; powerhouse; tailrace; switchyard and transmission lines; slope stability and realignment road; permanent facilities; temporary facilities - location, size, type, etc.; power evacuation, others)

3.5 Construction activities

3.6 Construction machinery, materials and other supplies (including estimated numbers/quantities)

3.7 Waste generation and disposal (including estimated quantities)

3.8 Manpower requirements (including estimates of immigrant labor)

3.9 Operation and maintenance (supplies; waste generation and management; manpower requirements; others).

4. Baseline description/analysis

4.1 Study area (describe the area of influence)

4.2 Physical environment (physiography; climate; geology and seismology; soils; hydrology; groundwater; flooding; geomorphology; sedimentation; water quality; air quality; noise; others). Develop the necessary cartography to demonstrate the spatial linkage with the project's area of influence. Scale suggested 1:100,000.

4.3 Biological environment (flora including natural vegetation, planted trees, medicinal plants, different habitat types, red list species (including the conservation status); fauna including mammals, birds including migratory birds, reptiles, amphibians, insects, fish and red-listed species; biodiversity including carrying capacity; protected and non-protected areas including hunting, poaching, illegal fishing; wetlands; and fisheries including benthic flora and fauna). Develop the necessary cartography to demonstrate the spatial linkage with the project's area of influence. Scale suggested 1:100,000.

4.4 Social and economic environment (population and demography; land use and natural resources including agriculture, livestock, grazing, forestry; land tenure system; occupations structure; income and expenditure; economic activities e.g. quarrying, tourism, fisheries, trade, services; social infrastructure and services including education, health, communications, others; vehicular traffic particularly Batkhela – Swat road, Bahrain – Kalam road and other important road arteries connecting the project area; access, law and order and security situation; community organizations; vulnerable groups and poverty situation; gender aspects; recreation areas/potential and others).

4.5 Cultural aspects (cultural heritage; archaeology; and other objects of special interest, e.g. graveyards, monuments).

4.6 Identification of environmental and social hotspots based on the baseline analysis.

5. Project alternatives

5.1 Without project alternative (describe the need for the development of this project and how it contributes to the project objective)

5.2 Site selection (rationale for site selection)

5.3 Design options (please provide options considered for the intake, tunnel alignment, powerhouse, and other temporary and permanent facilities along with their environmental and social implications; and rationale for selecting the final option).

5.4 Alternate Transmission Line routes (please provide options considered for transmission line alignment along with their environmental and social implications; and rationale for selecting the final option).

6. Other relevant issues

6.1 Risk of earthquakes (results of the seismic assessment carried out for the project, and seismic intensities considered for the design of various project components)

6.2 Risk of flooding (results of flood frequency assessment carried out for the project, and design floods considered for the project)

6.3 Climate change (an assessment of the climate change scenario and climate change adaptation measures)

7. Public Consultation and Information Disclosure

7.1 Scoping sessions (details of consultations on sharing the terms of reference and project scope)

7.2 Focused group discussions (details of focused group discussion on various environmental and social aspects)

7.3 Public consultations (details of public consultations carried, and feedback received)

7.4 Information disclosure

8. Environmental and Social Impact Assessment

8.1 Impacts on Physical Environment (impacts on terrain, soils, spoils, waste, and emissions from the construction activities)

8.2 Impacts on Biological Environment (impacts on flora, fauna, fish and riverine environment due to various project activities both during construction and operation)

8.3 Impacts on People (health and safety risks to local community and construction works due to exposure to hazards associated with the construction works)

9. Environmental and Social Management Plan (ESMP):

9.1 Institutional Arrangement (details of environmental and social staff involved with various project implementing agencies; and their responsibilities)

9.2 Mitigation Plan (mitigation measures to address potential impacts, and the staff responsible for implementation and supervision)

9.3 Monitoring Plan (monitoring measures to address potential impacts, and the staff responsible for implementation and supervision)

9.4 Grievance Redress Mechanism (details of GRM to address grievances from local communities and the works)

9.5 Training (details of training to be carried out for capacity building of the staff on environmental, social, health and safety aspects associated with the construction works)

9.6 Documentation and Reporting (details of documents and reports to be prepared during project implementation)

9,7 ESMP Cost Estimates (cost estimates for implementing measures proposed in ESMP).

Annex 5: Sample Environmental Monitoring Plan

Parameter	Means of Monitoring	Frequency	Responsible for Implementation	Responsible for Supervision
During Construction				
Topsoil	Visual inspection on stripping, storage and reuse of topsoil	Monthly	Contractor	CSC, PMO
Erosion	Visual inspection of erosion prevention measures and the occurrence of erosion	Monthly	Contractor	CSC, PMO
Operation of quarry sites	Visual inspection of quarry sites	Monthly	Contractor	CSC, PMO
Surface water quality	Sampling and analysis of river water quality and wastewater discharges for the parameters given in NEQS	Quarterly	Contractor	CSC, PMO
Surface water quality	Spot measurements of pH, conductivity, turbidity. Visual inspection of the presence of petroleum products.	Monthly	Contractor	CSC, PMO
Air Quality (dust, smoke)	Visual inspection to ensure good standard equipment is in use and dust suppression measures (spraying of waters) are in place.	Weekly	Contractor	CSC, PMO
Air Quality	Visual inspection to ensure dust suppression work plan is being implemented	Weekly	Contractor	CSC, PMO
Air Quality in tunnels	Spot measurements for CO and O2 (and other gases as defined in the WBG EHS Guidelines) levels in the tunnels	Monthly	EU-CSC	PMO

Parameter	Means of Monitoring	Frequency	Responsible for Implementation	Responsible for Supervision
During Operation				
Release of environmental flows	Record on release of environmental flows	Daily	PEDO O&M Staff	ESU
Use of fish ladder by fish	Fish counts through sensors installed in the ladder	Monthly	PEDO O&M Staff	ESU

Annex 6: Physical and Cultural Resource Management Framework and Chance Find Procedures

A. The PCR Management Framework

The PCR Management Plan can constitute a section of the ESIA, if one is required. The Management Plan should clearly:

- Schedule the implementation of the proposed PCR mitigating measures and PCR monitoring, if any, taking into account the weather pattern, and identify roles and responsibilities for such implementation;
- Identify procedures for handling chance finds, including the role and responsibilities of the cultural authorities and the contractor; and
- Identify procedures for addressing PCR impacts that may occur during implementation but were not predicted in the impact assessment.

The following are the main considerations guiding the preparation of the PCR Management Plan.

1. Policy, Legal and Regulatory Framework

This section should contain a reference to the following, including identification of any implications for the PCR component of the SIA/SMP, such as special standards or requirements:

- The World Bank's EA policy OP/BP 4.01 and the PCR policy OP/BP 4.11;
- Sections of national EIA laws, regulations and guidelines relating to PCR;
- Sections of the national environmental conservation strategy, if any, relating to PCR;
- Legislation and regulations relating to:
    - Antiquities, including sale and export;
    - Procedures for addressing chance finds, in terms of ownership and requirements by the contractor and cultural authorities;
    - Archaeology, including the issue of permits.
- Relevant authorities charged with PCR identification, protection and management, their powers, the legal basis for their authority, and their actual capacity;
- PCR-related conventions and treaties to which the borrower country is signatory;
- Sites in the borrower country currently listed by other international agency in the field of PCR such as the World Monuments Fund, or ICOMOS, as being of national or international importance;
- Any national or provincial registers of PCR maintained by accredited authorities in the borrower country.

2. Project Description

The project description should detail construction and operation phases, including maps, diagrams and plans of planned activities. The description should take into consideration any potential impacts on PCR of planned activities, construction/rehabilitation processes, transport arrangements, etc.

3. Analysis of Alternatives

In cases where there are major PCR issues, the analysis of alternatives should consider alternative project sites or technologies that could specifically avoid or minimize those impacts on PCR.

4. Baseline Data

The baseline data should begin with an investigation and inventory of PCRs likely to be affected by the project. The data should consider all types of PCR that might be impacted, covering:

- Living-culture PCR, as well as historical, archaeological and paleontological PCR;
- Natural and human-made PCR;
- Movable and immovable PCR;
- Unknown or invisible PCR.

The data collection activity should involve consultations with concerned parties and potentially affected communities. Potential data sources might include cultural authorities, national or provincial PCR registers, universities and colleges, public and private PCR-related institutions, religious bodies and local PCR NGOs. Sources at the community level typically include, for example, community leaders and individuals, schools, religious leaders, scholars, PCR specialists, and local historians.

The baseline data section should include maps showing PCR baseline data within the potential impact areas. In addition, data should detail the cultural significance or value attributed by the concerned or affected parties to the PCR identified in the baseline. Consultation is a particularly important means of identifying PCR and documenting its presence and significance. This will normally not be expressed in monetary terms, but rather should explain the nature of the cultural significance, for example whether it is religious, ethnographic, historic, or archaeological. In the case of PCR of archaeological, architectural, paleontological or other scholarly or scientific value, the PCR Management Plan should provide an assessment of the relative importance of the PCR in this regard locally, nationally and/or internationally.

5. Impact Assessment

PCR should be included in the impact matrix and PCR impacts for each project stage – construction/rehabilitation, operation, etc. – should be detailed. The PCR Management Plan should specifically describe the nature and extent of the potential impacts and state precisely why they are considered to be significant or insignificant. The impact assessment should also consider the possibility of accidents during construction/rehabilitation and operations which might affect PCR, especially in urban settings, which might call for special precautionary measures.

6. Mitigation Measures

It is particularly important that consultations with concerned and affected parties are conducted on the proposed mitigation measures relating to PCR impacts. Agreements must be reached, and evidence of such agreements should be included in PCR Management Plan. It should be checked whether the recommended mitigation measures might themselves have environmental impacts (e.g. archaeological excavations). PCR Management Plan should detail the cost of implementing and the timing of the recommended PCR mitigation measures.

B. Chance Find Procedures

Chance find procedures which will be used during this Project 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 nightguard shall be present until the responsible local authorities and relevant Department of Archaeology take over;

- Notify the supervisory Engineer who in turn will notify the responsible local authorities and relevant Department of Archaeology immediately (within 24 hours or less);

- Responsible local authorities and relevant Department of Archaeology 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 archeologists (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, historical, scientific or research, social and economic values;

- Decisions on how to handle the finding shall be taken by the local authorities and the relevant Department of Archaeology. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage;

- Implementation for the authority decision concerning the management of the finding shall be communicated in writing by the relevant Department of Archaeology; and

- Construction work could resume only after permission is given from the local authorities and relevant Department of Archaeology 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 are observed.

The contact details of the relevant institutions should be mentioned in the chance-find procedures of sub-project instruments.

Annex 7: Gender Development Framework

Gender is a key issue in social safeguard management in view of the different vulnerabilities of affected men and women. In view of their higher vulnerability levels, specific measures will be needed to enable the affected women-especially those who are poor, to cope with the project impacts. The process of gender-inclusive social management and resettlement planning includes gender analysis, project-specific gender considerations and a gender strategy and action plan.

Gender Considerations and Framework

Based on survey feedback in the project area, women have a limited role in decision-making. At the household level (extended family system), a male elder, normally makes all decisions relating to household, income, expenditure, education and health. The women are involved in different household activities, such as fetching drinking water from stream/nullah, collecting firewood from nearby hilly areas; washing clothes and household utensils; child-rearing and caring; looking after their cattle's and other indoor activities (social gathering/ function). In the project area, due to the existing culture, mobility for women outside of the village/tribe is restricted. In the project area, the main gender issues are related to privacy, mobility, limited property rights etc.

In the current context of the Project, the risk of Gender-based Violence (GBV) and Sexual Abuse and Exploitation (SEA) are considered as low. The risk has been assessed based on the country and legal context, gender norms and beliefs, and national capacity to respond. In addition, several project-specific factors including project location, type of infrastructure, accessibility of women for consultations, poverty levels, accessibility for supervision of project and others have been considered for determining the risk levels. By design, the alignment has mostly avoided populated areas. Therefore, interaction between the Project construction labor force and the communities is also expected to be limited, particularly with women due to the conservative culture in the region.

Commensurate with this risk level and also to be proactive, the Project has proposed several proactive measures to strengthen the Contractors' obligations and capacity to address SEA, HIV/AIDS, public health and safety risks, and ensure contractor supervision capacity to monitor mitigation of these risks.

In view of the above, a gender development framework has been prepared for in Table 1 below. It focuses on women's livelihoods development through income generation activities in KP and awareness-raising and access to services in the event of untoward incidents.

Table 1: Gender Development Framework

Activity	Project Impacts/ Risks (Resettlement & Construction)	Mitigation Measures	Frequency- Time frame	Responsibility
Communication/ Consultations and Information Dissemination	• Very less information regarding eligibility and entitlement of compensation to the PAPs including female members.	• Formation of Female PAP Committee (FPAPC). • Information dissemination to the PAPs including female members through continuous consultative meetings and distribution of brochures and pamphlets/ leaflets.	Continuous activity during the implementation of SIA/SMP, PCRMP (if required) and RAP/ARAP.	PMO/ESU

Activity	Project Impacts/ Risks (Resettlement & Construction)	Mitigation Measures	Frequency- Time frame	Responsibility
	• Lack of awareness of female APs about the project impacts and their mitigation measures	• Involve the FPAPC in the regular consultative process of the project	Continuous activity during the implementation of SIA/SMP, PCRMP (if required) and RAP/ARAP.	PMO/ESU
Data Management/ Data Depository	• Delay in the implementation of RAP/ARAP that deteriorates the process of eligibility & entitlement for compensation especially for women.	Develop a gender-segregated database covering the status of implementation of RAP/ARAP and SIA/SMP, PCRMP (if required) and updating of database on regular basis.	Continuous activity during the implementation of SIA/SMP, PCRMP (if required) and RAP/ARAP.	PMO/ESU
An influx of Labor, especially if from outside the project area.	• Possible issues (though low risk) related to GBV/SEA.	Awareness training for community and Labor. Strengthen Prevention in Contractor Documents	Periodically, and consistently, during project implementation.	PMO/ESU
Gender-Sensitive Grievance Redress Mechanism and Complaints Handling	• A complaint about the disorder of the pressing needs of women/ local community relating to the project that affects mobility during the construction activities • Difficulties in having access to social amenities • Disturbance in privacy during construction activities.	• Awareness about the gender-sensitive GRM and complaint handling process through consultative meetings, distribution of pamphlets and mobile penetration. • Ensure that the existing GRM is accessible to the FPAPC/local community (Jirga),is gender-sensitive. • Explore the establishment of Interactive Voice Response Service (IVRS) • Carrying out project implementation activities in consultation with the community/ local women to avoid peak hours working activities of women. • Training – capacity development for gender-inclusive project design and implementation.	Continuous activity during the implementation of SIA/SMP, PCRMP (if required) and RAP/ARAP.	PMO/ESU
Female skill training and Capacity Building of female training institutes at the community level.	• Deficiency of knowledge • Access to adequate training	• Design Training modules with a specific focus on women • Conducting trainings using female trainers	Continuous activity during the implementation of SIA/SMP, PCRMP (if	PMO/ESU

Activity	Project Impacts/ Risks (Resettlement & Construction)	Mitigation Measures	Frequency- Time frame	Responsibility
		• Prepare training proceedings • Encourage women participation in project implementation • Create a safe and culturally appropriate environment at female training institutions • Insure female accessibility to the trainings	required) and RAP/ARAP.	

Annex 8: Labor-Management Framework

This framework describes the requirements for the projects under program with respect to labor and working conditions applicable during the implementation phase of the project. It ensures that workers in the proposed project are treated fairly and provided with safe and healthy working conditions. It aims to ensure the management of issues that may arise due to labor-related risks. The Labor-Management Framework (LMF) sets out potential impacts; and consequences and describes its appropriate mitigation measures.

Objectives and scope

The purposes of the LMF are to:

- Promote fair and equitable labor practices for the fair treatment, non-discrimination and equal opportunity of workers;
- Establish, manage and promote a healthy management-worker relationship;
- Protect workers' rights including migrant and third-party workers;
- Promote healthy, safe, secure and comfortable accommodation that does not impact negatively on the communities in the surrounding area;
- Establish standards on workers' welfare, working and living environment; and
- To support the principles of freedom of association and collective bargaining of workers.
- This framework describes the requirements and expectations in terms of compliance, reporting, roles, supervision and training with respect to labor and working conditions, including working environment, camp management, accommodation and local community interaction.

The recommended measures include (i) encourage to engage local workers/laborers with the same terms and condition of outside workers/laborers; (ii) integrating provisions to redress labour related grievances in the Grievance Redress Mechanism (GRM) which should be well known to the laborers/workers and accessible; (iii) prohibition of child labor; (iv) no engagement of forced and bonded labor; (v) provision of a safe and healthy working environment to both male and female workers (if any); and (vi) taking steps to prevent accidents, injury, and disease and appropriate treatment for those suffering from occupational injuries/diseases; and encourage for insurance facility for workers.

Labor Management Framework

Table 1 presents an LMF including summary of the potential risks and impacts related to labor employment and working conditions, together with mitigation measures to avoid, eliminate or reduce associated impacts. The monitoring requirements to assess the performance of these mitigation measures are also described in this section.

Table 1: Labor and Working Conditions Management Framework

Category	Workers Impacts/ Risks	Project Impacts/Risks	Mitigation Measures	Monitoring	Monitoring Frequency	Responsibility
I. Labor Employment and Working Conditions						
Recruitment and selection of workers	- Perception of unfair recruitment and selection practices. - Child labor and school drop-out	Unpleasant work environment, which may affect the project activities.	Recruitment and selection of workers through adopting process including: - Company policy for recruitment - Eligibility - Selection criteria - Method of recruitment - Places of recruitment - Transparency - Preference to local citizens to avoid labor influx - Ensuring the children and minors are not employed directly or indirectly on the project - Communication on hiring criteria, minimum age, and applicable laws - Enforcement of legislation on child labor	Verify	On-going activity (at the hiring stage)	PMO/ESU and Contractor
Terms and conditions of employment (earnings/ benefits).	Perceptions that Wages/salaries and benefits are less for locals relative to outsiders/ foreigners.	Work stoppages/ protest, absenteeism, sit-ins, sabotage.	Labor procedures need to follow as below: - Contract arrangements and content - Equal pay for equal work - Process for pay increases - Pay scales and increments as well as other benefits.	Verify	Quarterly	PMO/ESU and Contractor
Labor relations (Conflict Handling)	Workers feel aggrieved and don't know how to vent their grievances.	- Workers embark on various forms of action. - Workers take matters into their own hands, which results in violence and conflict that affects workplace harmony.	Policy needs to include the following: - Effective grievance redress process which should be gender-sensitive - Disciplinary procedure - Workplace rules and regulations - Demobilization procedure - Effective Information dissemination to workers	Assessment	Monthly	PMO/ESU and Contractor
Labor communication mechanisms.	- Workers are not informed about activities/ or events that affect them	- Action due to rumours or incorrect perceptions - Poor morale and unproductive workforce	Effective communication mechanisms including: - Regular written communication for all workers about the project operations/activities - Worker committees/organization/unions - Use of notice boards/toolbox	Assessment	Monthly	PMO/ESU and Contractor

Category	Workers Impacts/ Risks	Project Impacts/Risks	Mitigation Measures	Monitoring	Monitoring Frequency	Responsibility
	- Workers are unable to communicate collective issues that bother them - Rumors/ misinformation spreads					
Labor behavior	Increased risk of illicit behavior and crime (theft)	Offensive work environment, which may affect the project related activities/operations	- Paying salaries into workers' bank accounts rather than in cash - Creation of supervised leisure areas - Cooperation with local law enforcement - Introduction of sanctions (e.g., dismissal) for workers involved in criminal activities - Enforcement of laws on drug abuse - Sensitization campaigns both for workers and local communities	Monitoring to prevent drugs trafficking	On-going	PMO/ESU and Contractor
II. Labor Camp Management						
Workers accommodation building specifications (Camps)	Accommodation is considered substandard which leads to discomfort amongst the workers; and concerns about perceived health risks.	Workers have low morale which in turn affects the project activities/operations.	A minimum standard of accommodation is proposed as well as other living standards are applied to labor camps[9].	Verify	Quarterly	PMO/ESU
Camp management practices	Workers (residents) do not live in harmony and the potential for conflict rises; so, they do not know how to	The conflict escalates which results discomfort to the workers and ultimately affects the project activities/operations.	The camp management must have the following: - Ensure the space/accommodation to all workers with equal terms and conditions (i.e. minimum space, facilities, safety, security). - Set-up for grievances redressal - Ensure the code of conduct	Verify	Prior to appointment	PMO/ESU and Contractor

[9] https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=9791

Category	Workers Impacts/ Risks	Project Impacts/Risks	Mitigation Measures	Monitoring	Monitoring Frequency	Responsibility
	complain or make a grievance in the camp.					
Camp location	Inappropriate campsite/or difficult access to campsite creates disturbance and un-comfort to the labor/ workers.	- Siting of camps may result in the displacement of residents, loss of productive lands and the resources upon these lands. - Camps may also restrict or impede access to areas for the local community. - Construction camps may result in a noticeable increase in traffic, noise and environmental pollution, which could negatively affect the social amenities of nearby communities and also pose a potential safety issue.	Selection of potential camp locations includes: - Selection based on the consultations with company representatives and affected communities - Approval from concerned local government organization with a requisite permit. - Environment & social management plan of the camp location which includes mitigation/avoidance measures.	Verify	Prior to establishing Camp On-going	PMO/ESU and Contractor
Maintenance	Equipment breaks down affecting accommodation standards	Workers living conditions are affected, which in turn could affect the motivation and performance of workers	Provide the following to have proper maintenance: - Regular maintenance - Replacement/repair of damages - Periodic supervision	Verify	Monthly	PMO/ESU and Contractor
Food and dining	- Food is not appropriate and there are long queues to get food. - Frustrating dining experience leading to some incidents in the dining hall (workers and kitchen staff).	Workers embark on the camp management regarding: - Incidents increase in the dining halls which could escalate towards violence - Morale is low which leads to poor interest and performance towards the project activities/operations.	Camp management ensures to provide: - Balanced food[10] - Potable water, accommodation, dining and recreation areas - Feedback/complaints on food and dining arrangements - Regular meetings with workers nominated representatives - Complaints must be trended and tracked for remedial action - Ensure that dining halls have adequate seating, condiments, cutlery and crockery for efficient service - Dining times need to be fixed and informed to all workers in the camp	Assessment	Monthly	Food Department and PMO/ESU

[10] approved by a Nutritionist

Category	Workers Impacts/ Risks	Project Impacts/Risks	Mitigation Measures	Monitoring	Monitoring Frequency	Responsibility
Housekeeping	The general appearance of the camp deteriorates making camp life unpleasant.	The overall camp experience is compromised which in turn leaves workers demoralized and demotivated.	- Ensure that campgrounds and common areas are routinely cleaned and organized with appropriate signage - Ensure access to laundry service to all workers	Verify	Regularly	PMO/ESU and Contractor
Recreation	Workers spend most of their time in the camp and become bored and disenchanted	Workers are dissatisfied which result as: - Non-initiative attitude - Lack of interest in work	Access to recreational spots for the workers especially during the weekend	Assessment	Monthly	PMO/ESU and Contractor
Spiritual/ Religious sites	Workers require to have access to the spiritual & religious places nearby the camp.	Non-attendance of spiritual and religious events/places, may cause frustration and unhappy attitude/behavior, which will have an adverse impact on the performance in the project related activities.	Ensure access to spiritual & religious places/sites. In addition, facilitate the workers in terms of transport/travelling activities. Provide awareness to workers to take care of social norms and cultural values of the community.	Assessment	Monthly	PMO/ESU and Contractor
Security	Inconsistent behavior of security personnel towards workers can result in tensions at workplace.	Insufficient security and control of security personnel, which may lead to inappropriate behavior.	Ensure the camp security personnel are: - Adequately trained for appropriate conduct towards workers and community members - Exercising constraint and caution and understand how force may be used.	Assessment	Quarterly	PMO/ESU and Contractor
III. Labor and Local Community Interaction						
Workers relations/ interaction with the community	- Disturbing the nearby communities due to the workers' routine activities such as recreation, and travelling etc. - Communities are negatively impacted by	All negative actions on the community may cause hindrance in the project construction/operation as well as other project related activities, such as road blockage, community sit-ins resulting prevention of workers, contractors & suppliers from entering the Project/ worksite.	Implement the control measures to avoid/and or minimize the impacts of camp and living conditions of workers on communities. Control measures include: - Encourage to recruit local labor/staff - Limited interaction of outsiders/foreign workers with the local/nearby community of the camp - Provide cultural sensitivity awareness training to facilitate appropriate actions interaction with communities - Limited movement of workers during the peak working hours of the community.	Assessment	Quarterly	PMO/ESU and Contractor

Category	Workers Impacts/ Risks	Project Impacts/Risks	Mitigation Measures	Monitoring	Monitoring Frequency	Responsibility
	some camp activities as well (i.e. lighting, traffic movement).					
Risk of social friction	- The difference in cultural norms & ethics disturbs the routine life of workers and community as well. - Frequent visit of workers at community places can arise friction between workers and community	Impact on the project includes: - Strikes by local workers and community which could lead to the work stoppage - Absenteeism and sit-ins	- Provision of information regarding workers code of conduct in the local language(s) - Organize cultural sensitization/awareness for workers - Consultations with and involvement of local communities in project planning and implementation - Awareness-raising among local community	Assessment	Quarterly	PMO/ESU and Contractor
Increased traffic and rise in accidents	Use of already existing roads to project and workers' campsites may cause accidents and increased burden on community	Less organization of commute to work may increase traffic on community road and risks of accidents on roads that may affect the mobility of local community and supplies of materials for the project	- Preparation and implementation of a traffic management plan which might be covered under the ESMP - Construction of additional/separate access roads to project and workers' campsites - Organize road safety training and defensive driving training for staff	Assessment	Quarterly	PMO/ESU and Contractor

Monitoring

The monitoring for the implementation of LMF will be carried out to (a) document the implementation and effectiveness of management and mitigation measures; (b) assess actual impacts against predicted impacts; (c) demonstrate compliance with applicable legal and other requirements. Monitoring will be carried out based on both desk work and field-based verification to confirm that specified mitigation measures are being implemented effectively and achieving the intended outcomes.

The project will undertake monitoring/assessments to determine the extent to which this framework is being implemented. The assessment will be undertaken by social development consultant deployed by Contractor, who will monitor the implementation and submit the report to PMO/ESU. There will also be a third-party validation Consultant to be engaged by the PMO , who will undertake periodic monitoring to determine the compliance of this framework.

Performance Indicators

Performance indicators are used to measure and track performance against the effectiveness of mitigation and control measures discussed in this framework. Performance indicators are measurable against a specified target. The performance indicators need to be recorded and accordingly suggest the remedial measures to reduce potential risks and to be reported in periodic reports. List of performance key indicators which will need to be derived are as below:

<u>Labor employment and working conditions</u>

- Grievances lodged by type and number
- Disciplinary action by type and number
- Induction training numbers, queries and comments
- Issues raised by workers' committees and action taken
- Workforce numbers by local and outsider/foreign workers
- Actual demobilization numbers against planned targets and the incidents around demobilization
- Project-related incidents - stoppages go-slows, threats, damage to property, violence (if any)
- Absenteeism, sick leave and late arrivals

<u>Labor camp management</u>

- Grievances lodged by type and number
- Disciplinary action by type and number
- Induction training numbers, queries and comments
- Issues raised by camp committees and action taken
- Camp numbers by local and foreign workers
- Camp incidents
- Food or lodging complaints
- Recreation activities

<u>Labor and local community interaction</u>

- No. of community roads used for project purposes
- No. of community concerns registered

- Grievances lodged by the community by type and number
- Disciplinary action against concerned employees by type and number
- Campsites accidents by type and numbers

Information Management

The information management system during project implementation stage will need to be developed to manage data including labor employment & working conditions, camp management, labor interaction with community and other. The information tracking system will be used during implementation considering the key performance indicators and tracking will be used for non-compliances identified in the monitoring reports and accordingly corrective action plan will be prepared.

Reporting

An internal monitoring periodic report will be compiled to address the labor and working conditions aspects as discussed in this framework, while an external monitoring report will be undertaken by third party consultant and quarterly monitoring report will be pared and accordingly submitted to PIU for onward submission to World Bank.

Training and Awareness

Training needs assessment will be conducted to analyze the knowledge and skills of project workers and community representatives who will be considered for the training implementation. The training and awareness program will cover but not limited to the following areas as presented in Table 2 below

Table 2: Training areas and timelines

Training areas	Participant	Timeline	Frequency
Mitigation measures including all procedures	Supervisors and senior camp management Personnel who will be involved in training, reporting or monitoring activities.	Prior to commencement of work	Once prior to commencement of work
Workplace induction including: - Payslips - Disciplinary and grievance procedures - Cultural awareness - Code of conduct	All workers	Prior to commencement of work	Refresher training annually
Camp induction including: - Rules and regulations - Code of conduct - Camp committee system - The camp food complaints system - Interaction with communities and - Security.	All camp residents	Prior to commencement of work	Refresher training annually
Monitoring	Personnel who will be conducting monitoring events	Before monitoring commences	Refresher training annually
Reporting and performance indicators	Personnel who will be	Before reporting commences	Refresher training annually

Training areas	Participant	Timeline	Frequency
	compiling reports relating to labor and working conditions		
Human rights awareness	Senior Management, Supervisors, security personnel (staff and contracted	Prior to commencement of work	As required by changes in training materials or awareness topics

Annex 9: Stakeholder Engagement Framework

INTRODUCTION

Stakeholders are persons or groups who are directly or indirectly affected by a project as well as those who may have interests in a project or the ability to influence its outcome, either positively or negatively. The PMO requires to develop a Stakeholder Engagement Plan for each project under the Program (KPHREDP) in compliance with the legal framework of GoKP and World Bank OP 4.12. The stakeholder engagement will be ensured through consultations and participation to ensure Project's acceptability and establishing a constructive relationship between the PAPs and other stakeholders of the Project. It is essential to provide accurate information about the Project to stakeholders especially to PAPs from the planning stage onwards, to prevent misunderstanding and misinformation, and to build trust between the different stakeholders and the Project team. A solid and comprehensive Stakeholder Engagement Plan (SEP) be developed for each subproject to help the Project team to engage in more effective and focused consultations with the stakeholders, to share ideas about planning and implementation, to benefit from local knowledge, and to make more informed decisions.

REQUIREMENTS OF STAKEHOLDER ENGAGEMENT

National and Provincial Requirements

Article 19 A Right to Information states that Every citizen shall have the right to have access to information in all matters of public importance subject to regulation and reasonable restrictions imposed by law. The Khyber Pakhtunkhwa (KP) Right to Information Act 2013 ensures transparency and accountability through a mechanism whereby citizens could seek information of public importance from public bodies as enshrined in Article 19-A of the constitution of Pakistan.

To oversee the enforcement of the law, the KPK Right to Information (RTI) Commission was established in 2013 as an independent statutory body headed by KP Chief Information Commissioner, RTI Commission and two Commissioners with the primary function to receive and decide complaints of citizens who are denied information by the public bodies. The commission also has the responsibility to create awareness about the law and taking all other measures for the effective implementation of the law. The primary responsibility of the Commission is to ensure that the request of the citizens is processed in time by the public bodies. If the citizens file any complaint against a public body, the Commission after hearing the citizen and the public body takes a decision.

In order to more effectively manage risks and impacts of projects, the PMO and all parties involved in project implementation are required to engage Project Affected People through

- disclosure of information;
- meaningful Consultation and
- development and implementation of systems for responding to complaints and grievances commensurate to the level of social risk. The nature, frequency and level of effort of this engagement will be commensurate with the project's risks and impacts and the project's phase of development"

World Bank Requirements

The World Bank OP 4.12 considers public consultation and stakeholder engagement as an on-going process, to be started at the earliest stage of the environmental and social assessment process, and to be continued throughout the entire life of the WB financed projects. An essential element in the stakeholder engagement process, in order to ensure meaningful and effective consultation process, is the careful

identification of all involved stakeholders and the examination of their concerns, expectations and preferences. Special attention should be paid to the identification of vulnerable stakeholders. The World Bank outlines the process of stakeholder engagement throughout the program/project cycle as explained in Table 1 below.

Table 1. Stakeholder Engagement and the Project Cycle as per World Bank Guidelines

	PROJECT CYCLE	STEPS
1	Identification	Identification of stakeholders and analysis
2	Preparation (concept stage)	Preliminary dissemination of information and consultations
		Gathering of information (i.e. census and socioeconomic survey)
		Dissemination of information during poverty, social and gender assessment, census, socioeconomic surveys, preliminary resettlement options, and entitlements and formal consultations with PAPs, their representatives, and local NGOs; participation in decisions regarding resettlement and income restoration options, environmental impacts and mitigation measures.
3	Pre-appraisal	Preparation of the RAP and ESIA (exploration of income restoration options)
4	Appraisal	Finalization of the RAP and disclosure
5	Implementation	Participation in committees i.e. GRM; . Participation in compensation and resettlement and rehabilitation assistance; and participation in monitoring
6	Completion	Participation in evaluation

PRINCIPLES OF STAKEHOLDER ENGAGEMENT

Stakeholder Engagement will be free of manipulation, interference, coercion, and intimidation, and the basis of timely, relevant, understandable and accessible information, in a culturally appropriate, gender and socially inclusive manner. It involves interactions between identified groups of people and provides stakeholders with an opportunity to raise their concerns and opinions (e.g. by way of meetings, surveys, interviews and/or focus groups), and ensures that this information is taken into consideration when making project decisions. The SEP is based on the principles of relevance, social and gender inclusiveness, accessibility, transparency, contribution, benchmarking and accountability. Specifically, common principles based on International Best Practice include the following:

- All stakeholders belonging to any group will be recognized and engaged, the identified stakeholders are diverse in terms of education, access to print and electronic information, geographical location (urban and rural), language, and needs.
- It is neither necessary nor practical to engage with every stakeholder with the same intensity, the level of engagement would thus be determined by the importance and relevance of the stakeholder groups;
- Commitment is demonstrated when the need to understand, engage and identify the community/stakeholders particularly the affected persons are recognized and acted upon early in the process;
- Integrity occurs when engagement is conducted in a manner that fosters mutual respect and trust;
- Respect is created when the rights, cultural beliefs, values and interests of stakeholders and neighboring communities are recognized;

- Transparency is demonstrated when community concerns are responded in a timely, open and effective manner;
- Inclusiveness is achieved when broad participation is encouraged and supported by appropriate participation opportunities; and
- Trust is achieved through open and meaningful dialogue that respects and upholds a community's beliefs, values and opinions.
- Provide appropriate means to the stakeholders to register grievances and all grievances are to be recorded and investigated, and appropriate actions to be taken, irrespective of the nature or severity of the grievance;
- Either a grievance is not eligible for further consideration —whether corrective action is required/taken or PEDO decides no action is merited—the outcome is to be communicated to the aggrieved party;
- The stakeholder engagement benchmarked against achievable targets so that the performance and effectiveness of the stakeholder engagement can be measured;
- Given a person having a grievance against PEDO or project is not satisfied with the response of PEDO, s/he would have a right to be heard at a higher administrative level which would have the power to ask PEDO to take appropriate corrective measures and the aggrieved parties would also have a right to seek the resolution through the court of law.

STAKEHOLDER ENGAGEMENT CONSIDERATIONS

The following considerations should be made when planning for stakeholder engagement based on consensus from practitioners:

- It takes time and resources: It takes time to build trusted relationships with stakeholders. Additional stakeholders might be identified that also want to be engaged. No willing stakeholder should be excluded from the process of engagement. Some stakeholders will need to be educated about the concept of engagement itself, as well as on the complex issues requiring specialized and technical knowledge. These demands can increase the cost of consultations required to meet external expectations, and often this occurs at a time when a project lacks the internal capacity and resources to implement a broader stakeholder engagement strategy;
- Raised expectations: Stakeholders can have unrealistically high expectations of benefits and unrealistic estimates of risks and losses from a project. As such project entities from the beginning must make efforts to provide accurate information for establishing a clear understanding of benefits, risks and impacts.
- Securing stakeholder participation: Cultural norms and values can prevent stakeholders from freely participating in meetings particularly socially excluded groups and women. It is important to conduct socially and gender-inclusive consultations. Often there are conflicting views within the affected people and other stakeholders, and thus it is important for the project to work with those who are the representatives of common interests.
- Consultation fatigue: There are some evidences which suggest that stakeholders can easily tire of consultation processes especially when their opinions and concerns are not taken into consideration and promises are not fulfilled. Often stakeholders feel their lives are not improving as a result of a project and this can lead to consultation meetings being used as an area to voice complaints and grievances. This ought to be avoided by managing expectations, misconceptions, by disseminating accurate project information, and by gathering stakeholder opinions and concerns and their timely addressal.

STAKEHOLDER IDENTIFICATION

There are several groups of people and social groups who are interested in the Project on different levels. These may be described as the following:

- people and social groups who will be directly or indirectly influenced by the Project
- people and social groups who participate in the implementation of the Project
- people and social groups who have a possibility to influence and make decisions on implementation of the Project.

The tables below provide the detail of stakeholders that are identified for the Program:

Table 2 : Key Stakeholders of KPH&RE Program

Stakeholders that will be directly or indirectly influenced by the Project	Stakeholders who participate in the implementation of the Project	Stakeholders with the possibility to influence and make decisions on implementation of the Project
• Affected persons or communities where the projects under the Program will be implemented; • Affected persons of associated infrastructure such as transmission line, towers; • Residents along transport routes / access roads / informal pathways, commuters; • Local jirgas, NGOs or other groups	• PEDO • KP Revenue Department • District Collector and tehsil revenue staff • Project Implementation Consultants • Contractors, sub-contractors and service providers; • Equipment suppliers • Transport companies • Forest, Environment and Wildlife Department • Fisheries Department • Pakistan Meteorological Department • Communication and Works Department • KP Archeological Department • National Transmission and Dispatch Company • Peshawar Electric Supply Corporation • Emergency services	• Planning and Development Department, Government of KP • Energy and Power Department • District administration / Collector and his/her staff • KP Environment Protection Agency

Table 3. Preliminary Classification of Stakeholders

Engage	BOR/Revenue Department; Affected Persons, general public residing along the project area; public representatives; print and electronic media (provincial and federal), World Bank; Project Steering Committee;
Leverage	academia
Monitor	CSOs, Environment Protection Agency; Labor Department

Inform	Relevant Gov't departments

STAKEHOLDER ANALYSIS

The stakeholder analysis for each subproject will be done to determine the likely relationship between stakeholders and the project, and thereby helps to identify the appropriate methods of consultations and information disclosure to the stakeholder during the life of the project. The stakeholders are classified into two categories:

- Internal stakeholders
- External stakeholders

STAKEHOLDER ENGAGEMENT APPROACH

The projects under the Program will follow the following approach for stakeholder engagement for each phase of the project:

Engagement Phases:

Stakeholder engagement throughout the project cycle safeguards the risks and impacts and mitigates them as soon as they are identified. This is to avoid or minimize adverse potential impacts, cost-effective project design, smooth running of project activities during the planning/designing, implementation and operational phases of the Project. Thereby, stakeholder engagement is an ongoing process throughout the project lifecycle to guarantee that the interests of the affected people and other stakeholders are safeguarded. The stakeholder engagement phases include:

- Engagement during ESIA and RAP Baseline
- Engagement during ESIA and RAP Disclosure at the stage of draft instruments and after finalization
- Engagement during ESMP and RAP Implementation
- On-going engagement during the operational phase

ESIA and RAP Baseline Phase

The first phase of the stakeholder engagement started before the initiation of collecting baseline environmental and social data within the impact zone and area of influence for various components of the environment (such as air, noise, water, land etc.) and socio-economic features. Primarily, the baseline data has been collected through comprehensive literature reviews, field visits to the proposed site, field studies & investigations, environment monitoring and discussions with individuals of institutional stakeholder agencies. The baseline social and resettlement impact data collected through surveys and studies to assess the types and extent of impacts on the affected people and study their socio-economic conditions.

The baseline data collection activities include the use of questionnaires, semi-structured interviews, in-depth interviews of key informants, focus group discussions and a use of a number of qualitative assessment tools for poverty, social and gender analysis with several categories of affected persons (transact walk, village profiling, village resource mapping, social mapping, poverty analysis through wealth ranking, institutional mapping, perception analysis of risks and impacts; seasonal calendars; men, women, and children mobility charts; men, women and children daily activity charts; income and expenditure analysis of households; gender roles and responsibilities analysis). The purpose was to collect baseline information on social and economic aspects of the affected population and the assessment of impacts on their assets, income and livelihoods and socio-economic conditions. In addition, it included discussions and interviews with institutional stakeholders, mass meetings with affected persons in their villages, and

workshops with the affected persons and other key stakeholders. The objectives of the engagement during the baseline phase are:

- Introduce the project, ESIA and resettlement planning process to the key stakeholders;
- Explore alternatives and seek solutions for enhancement of project benefits and minimize project adverse impacts through alternatives;
- To get facilitation in collecting baseline data by learning through local knowledge and understanding of local cultural and social values and norms, particularly for environmental and social baseline conditions;
- Ascertain the potential impacts of the project to develop mitigation measures for project subsequent phases;
- Provide opportunities to the key stakeholders to express their views and concerns and provide suggestions particularly the affected persons on the potential impacts and identified mitigation measures;
- Promote ownership of the project and enhance social acceptability.

ESIA and RAP Disclosure Phase

The second phase of the engagement focuses on disclosing and consulting after the preparation of draft ESIA and RAP documents. The objectives of the engagement through consultation and disclosure of draft ESIA and RP are:

- Share the results of environment and social impact assessments and mitigation measures
- Receive stakeholder input on proposed mitigation measures and enhancement of measures;

During this engagement phase, disclosure and consultation activities will be designed along with the following general principles:

- The ESIA and RAP will be widely and proactively publicized through PEDO and World Bank websites; delivery/placement of ESIA and RAP reports in the Village Information Centers (VICs), offices of relevant gov't departments including Environment Protection Agency, CSOs, and academia to maximize accessibility, and would be disclosed at least 2 weeks prior to feedback meetings with PAPs and other stakeholders;
- The ESIA and RAP summaries will be prepared to present information in simple and non-technical local language(s) for wider dissemination to the stakeholders to ensure that affected people and other stakeholders are informed of the key contents of both of the reports prior to the meetings or other consultation events;
- Location-specific face-to-face meetings will be organized with the stakeholders and the PAPs to facilitate them to understand key contents of the documents;
- Any groups of the stakeholders can comment and raise concerns on the draft reports of ESIA and RAP during the disclosure period. Feedback forms will be provided along with the documents to the stakeholders and have been provided in Appendix 1. Comments can either be sent to PEDO via emails at Pakhtunkhwa Energy Development Organization (PEDO), Plot # 38, Sect ،B-2, Phase 5 Hayatabad, Peshawar, Khyber Pakhtunkhwa, or verbal feedback can be shared via telephone at (091) 9217329 and email: info@pedo.pk
- The concerns, which will be raised by the stakeholders, will be recorded and addressed by incorporating additional measures in the environment and social mitigation measures and other aspects of environment and social management.

The draft ESIA and RAP will be updated / finalized based on the changes to be made the stage of detailed design and will be again endorsed by PEDO and will be review and cleared by WB. After the clearance of

the updated ESIA and RAP, both of the documents will be disclosed again by following the principles mentioned above. The full RAP both in English and Urdu will be made available at key accessible and convenient locations to disclose publicly such as in the offices of Energy and Power Department, and district administration/district collector, tehsil administration/Assistant Commissioner, VICs, CSOs and academia and at offices of other relevant gov't departments, and to the Affected Persons through localized means of communication. The Social and Resettlement Staff of PMO, PIC and Contractor will hold location-specific meetings with male and female PAPs at the project sites and make them aware of important aspects of the updated ESIA and RAP through workshops and face-to-face meetings particularly with illiterate APs.

Engagement during Implementation of ESMP and RAP

A continued process of stakeholder engagement with PAPs and other stakeholders will be followed to ensure transparency in implementation of ESMP and RAP and to keep the affected persons and other stakeholders informed. The feedback would be received and incorporated at various stages of the Project implementation. It will provide a good measure to improve the social acceptability of the project and ensure effective participation of the stakeholders in project implementation, especially to the PAPs in the process of RAP implementation. Stakeholder engagement will assist obtaining cooperation from informed PAPs and other stakeholders, to avoid cost and time in dealing with complaints and grievances. As per the requirements of the WB Policy, plans for the stakeholder engagement/consultation and participation during implementation of ESMP and RP to be developed as a part of ESIA and RAP. The PMO will continue stakeholder consultation process by following WB Policy and GoKP requirements (disclosure and exchange of information) by taking the following steps:

- The PEDO through male and female Environment and Social Staff (E&S) of PMO, PIC, the Contractor and other involved parties will keep a close liaison with the stakeholders including male and female PAPs;
- Address stakeholder concerns, complaints and grievances, and keep their record;
- The Project will engage female social staff to ensure on-going consultations with women and address their concerns, and to equally benefit the women and girls from the Project. During the implementation of the RAP, the PEDO and PMO will take into account the women's and young girl's views and priorities, as a result of planned consultations.
- Organize periodic meetings with the stakeholders and appraise them about the implementation progress of the Project including implementation of environment and social instruments (ESMP, RAP and GAP);
- Detail and outcome of all stakeholder engagement activities will be included in monthly, quarterly, bi-annual and annual internal monitoring reports of PIC.
- Disclose all monitoring reports in the same manner as that of the approved ESIA and RAP at PEDO/the Program and WB websites and to the PAPs and other stakeholders through appropriate means of communication.

STAKEHOLDER ENGAGEMENT TECHNIQUES

Numerous techniques will be used to engage stakeholders and to register their feedback. The use of techniques may vary according to the target audience. The techniques will include the following:

Table 4: Stakeholder Engagement Techniques

Engagement Techniques	Appropriate Application of Technique
Public Meetings	• Disseminate project information to the group of stakeholders • Facilitate the meetings by providing the participants with information on pamphlets, using whiteboards, interactive presentations, videos and models • Engage Stakeholders and encourage them to collectively and individually voice their views and opinions • Respect their views and opinions • Build relationships with the stakeholders • Record the responses and opinions
One-on-one Interviews	• Engage Stakeholders and disseminate project information • Collect views and opinions • Encourage stakeholders to speak freely • Establish a relationship with stakeholders • Record the views and opinions
Stakeholder Engagement Workshops	• Formally present the stakeholders with detailed project information • Distribute detailed project information to entail better stakeholder understanding of the project • Facilitate stakeholder feedback by using participatory exercises such as brainstorming exercises, group discussions, analyze information and develop recommendations and strategies • Collect stakeholders' feedback • Take note of stakeholder feedback • Prepare to follow up / corrective action plans to address the issues raised in the workshops
Focus group meetings	• Collect a group of 6-10 people and ask for their views and opinions on the project • Collect baseline information to gather the existing environment and socio-economic situation of the area • Use a set of prescribed questions to keep the meetings focused • Record responses
Surveys	• Individually visit and interview people in the affected community in the project area • Gather baseline data • Record and analyze data • Develop a baseline database for monitoring project impacts
Print and Electronic Media	• Disseminate project information to the local audience in the local language • Ensure that the information is distributed in a culturally sensitive manner so that it reaches everyone in the audience including affected person, women and vulnerable in the project area
Information Center and Notice Boards	• Establish Information Boards and centers in each project area • Establish a designated telephone number for quarries and information collection and complaints

Monitoring and Reviews

It is vitally important to monitor the effectiveness of the SE activities including GRM. The key performance indicators (KPIs) for this include weekly reporting on the number of grievances received, resolved and outstanding. This will be undertaken by the ES staff of PMO with the assistance of ES staff of PIC and contractor, and reported to the Project Director, Program Director, GRC and WB in periodic progress reports. As part of the annual review/report, analyzing the trends and time taken for grievance resolution will help to evaluate the efficacy of the GRM. As part of stakeholder engagement and consultation, involving the views of the stakeholders for whom the GRM is designed. The monitoring and review will help to improve effectiveness and stakeholder acceptance.

The PMO will maintain a database and activity file throughout the project detailing all public consultations, information disclosure and grievances collected, which will be available on the Project websites or on request for public review. Stakeholder engagement should be periodically evaluated by third party monitoring agency/consultant, assisted by ES staff of PIC and contractor. The following indicators will be used for evaluation:

- Level of understanding of the project stakeholders;
- Grievances received and how they have been addressed;
- Development of Corrective Action Plans;
- Level of involvement of affected people in consultation activities.

In order to measure these indicators, the following data will be used:

- Implementation timeline of Corrective Action Plans;
- Management responses linked to minutes of meetings;
- Weekly, monthly, quarterly/six-monthly and annual reports;
- Feedback from primary stakeholder groups (through interviews and focus group discussions with a sample of affected people);
- Feedback forms, stakeholder engagement activity register, grievance logging and initial response template, grievance management register, consultation notes, and complaint closure forms.

REPORTING

Weekly and Monthly Reports

The E&S staff of PIC and contractor will prepare brief weekly and monthly reports on stakeholder engagement activities to report to the PMO and PEDO, which include:

- Activities conducted during each week and month;
- Public outreach activities (meetings with stakeholders, dissemination of information education and communication material i.e. leaflets, posters brochures, newsletters, local radio and TV channels, non-technical summary of documents and reports etc.);
- Number of feedback forms;
- Entries in stakeholder enragement activity register;
- Entries to the grievance register;
- Number of visitations to the Information Centers;
- Number of meetings with APCs;
- Monthly stakeholder engagement activity plans.

Six Monthly and Annual Reports

Monthly reports will be used to develop six-monthly and annual reports; E&S staff of PIC will compile a report summarizing SE results on an annual basis and will submit to the PMO and WB for review. This report will provide a summary of all public consultation issues, grievances, Corrective Action Plans and their implementation status/resolutions. The report will provide a summary of relevant public consultation findings from informal meetings held with APs and other stakeholders.

A midterm and end of the project evaluation will be conducted by a third-party consultant/firm using a perception survey, which will use the same set of indicators over time to achieve continuity. The first survey to assess stakeholder perceptions should be conducted before major construction work to provide a baseline for APs and other stakeholder perceptions.

Reporting Back to the Stakeholders (Disclosure)

PEDO through PIU will provide the opportunity to report back to the affected persons and other stakeholders on matters relating to:

- main findings from the annual monitoring;
- progress on implementation of the mitigation measures;
- Overall progress on the ESMP and RAP implementation;
- Corrective Action Plan to address any outstanding issues.

Whilst the exact reporting mechanism and formats are to be finalized during the initial stage of project implementation, and upon finalization, the SEP will be updated. The annual monitoring reports will be disclosed to the Program and PEDO websites and will be accessible to all interested stakeholders.

Appendixes of 1 of Annex 9

Appendix 1: STAKEHOLDER FEEDBACK FORM

Name: Signature: Date:

Contact: Address:

Purpose of Contact: Please tick

Feedback	Comment	Query	Incident	Grievance

Actions Required:

Actions Taken:

Taken by (name): Position: Date:

Signature:

Appendix 2 : GRIEVANCE LOGGING AND INITIAL RESPONSE TEMPLATE

Date of Receiving:		Grievance Number:	
Mode of Receiving:			
Name of Aggrieved Party/Person(s)			
Name of Organization			
Position			
Address			
Telephone/Fax			
Cell Number			
Email Address			
Most effective means to receive response (please tick)	Post: _____	Email: _____	Phone: _____
Nature of Complaint:			
Received by:			
Date Inputted			
Initial Response (date and sent by):			
Resolved / Addressed by	Name:	Signature:	
Nature of Resolution			
Date of Resolution			
On-going/Closed			
Comments, if any			
Name of Signature of ESS staff			

Appendix 3: FORMAT FOR CONSULTATION NOTES

Date:

Location:

Participations (a sign-in sheet):

Agenda:

Actions Agreed:

Next Steps for Follow-up:

Annex 10: Public Consultation Meetings - Photographs

ESMF Disclosure at Dir Patrak on November 9, 2019

ESMF Disclosure at Dir Patrak on November 9, 2019

ESMF Disclosure at Dir Patrak on November 9, 2019

ESMF Disclosure at Dir Patrak on November 9, 2019

ESMF Disclosure at Kalam on November 7, 2019

ESMF Disclosure at Kalam on November 7, 2019

	
Gander consultation at Kalam on November 14, 2019	ESMF Disclosure at Kalam on Oct 17, 2019
	
Stakeholder Consultation at Peshawar on Oct 21, 2019	Stakeholder Consultation at Peshawar on Oct 21, 2019