

# Project Administration Manual

Project Number: 49055-007  
Loan Number: LXXXX

Islamic Republic of Pakistan: Balakot Hydropower  
Development Project

## **ABBREVIATIONS**

ADB	–	Asian Development Bank
AIIB	–	Asian Infrastructure Investment Bank
APFS	–	audited project financial statement
EIA	–	environmental impact assessment
EMP	–	environmental management plan
EPC	–	engineering, procurement and construction
EPD	–	Energy and Power Department, government of Khyber Pakhtunkhwa
FMA	–	financial management assessment
GAP	–	gender action plan
LARP	–	land acquisition and resettlement plan
MW	–	megawatt
NGO	–	nongovernment organization
OCB	–	open competitive bidding
PAM	–	Project Administration Manual
PCR	–	project completion report
PEDO	–	Pakhtunkhwa Energy Development Organization
PIU	–	project implementation unit
PMC	–	project management consultant
TOR	–	terms of reference

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### **Project Administration Manual Purpose and Process**

The project administration manual (PAM) describes the essential administrative and management requirements to implement the project on time, within budget, and following the policies and procedures of the government and Asian Development Bank (ADB). The PAM should include references to all available templates and instructions either through linkages to relevant URLs or directly incorporated in the PAM.

The executing agency, Energy and Power Department, Government of Khyber Pakhtunkhwa; and implementing agency, Pakhtunkhwa Energy Development Organization, are wholly responsible for implementing the ADB-financed project, as agreed jointly between the borrower and ADB, and following the policies and procedures of the government and ADB. ADB staff are responsible for supporting implementation including compliance by the executing and implementing agencies of their obligations and responsibilities for project implementation following ADB's policies and procedures.

At loan negotiations, the borrower and ADB shall agree to the PAM and ensure consistency with the loan and project agreements. Such agreement shall be reflected in the minutes of the loan negotiations. In the event of any discrepancy or contradiction between the PAM and the loan and project agreements, the provisions of the loan agreements shall prevail.

After ADB Board approval of the project's report and recommendations of the President, changes in implementation arrangements are subject to agreement and approval pursuant to relevant government and ADB administrative procedures (including the project administration instructions) and upon such approval, they will be subsequently incorporated in the PAM.



## I. PROJECT DESCRIPTION

1. The project will finance the construction of a 300 megawatt (MW) run-of-river hydropower plant located on the Kunhar river in Mansehra District, Khyber Pakhtunkhwa Province. The project will (i) improve energy security by increasing the clean energy share in the country's energy mix currently dominated by thermal power generation; (ii) boost the economy and promote revenue generating investments in the hydro-abundant Khyber Pakhtunkhwa Province; and (iii) build capacity and awareness on climate change impacts, adaptation and mitigation measures.<sup>1</sup> The project also targets to improve the quality of life of women in communities surrounding the project area and promotes gender mainstreaming.

2. **Impact and outcome.** The project is aligned with the following impact: carbon footprint reduced; and energy sector made more renewable, efficient and reliable.<sup>2</sup> The project will have the following outcome: energy security in enhanced.

3. **Output 1: Climate-resilient hydropower plant commissioned.** A 300 MW hydropower plant will be commissioned near Balakot City in Khyber Pakhtunkhwa Province by 2027. Its design will incorporate seismic strengthening and climate-proofing measures. The additional hydropower capacity will improve the energy mix by adding 1,143 gigawatt-hours of clean energy annually to the system and will enhance the sector's reliability and sustainability, leading to better energy security. A community development program will be implemented to cater to the socio-economic needs of the affected communities and the communities surrounding the project area. This will improve the livelihood opportunities for the displaced households and adjacent communities, including women and vulnerable segments of the population; build economic resilience; and improve their capacity to cope with risks such as health, climate change, natural disasters, and other contextually relevant issues.

4. **Output 2: Capacity for climate change risk management in hydropower production enhanced.** Awareness will be developed among the communities with specific training for women and youth groups to serve as climate change leaders. Pakhtunkhwa Energy Development Organization (PEDO) staff will be trained to incorporate climate change risk guidelines into hydropower plant operations.

5. **Output 3: Pakhtunkhwa Energy Development Organization's revenues from indigenous resources increased.** PEDO will supply one-third of the electricity generated from the 300 MW hydropower plant to the Peshawar Electricity Supply Company and the rest to the National Transmission Despatch Company Limited. This will substantially increase PEDO's revenue and will help reduce average daily load shedding in Khyber Pakhtunkhwa Province.

6. **Output 4: Income-earning opportunities and skills for local communities increased.** During construction, the local population will benefit from job opportunities, commercial activities, and material supply. The project will generate more than 1,200 jobs skilled and unskilled jobs for male and female workers, of which about 40% sourced will be sourced locally. The project design includes livelihood skills development for women, who have limited economic opportunities.

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<sup>1</sup> The Asian Development Bank (ADB) provided transactional technical assistance to develop the proposed Balakot Hydropower Development Project. ADB. 2016. [Technical Assistance to the Republic of Pakistan for Hydropower Development Investment Program](#). Manila (TA 9185-PAK).

<sup>2</sup> Government of Pakistan. 2013. [National Power Policy 2013](#). Islamabad.

## II. IMPLEMENTATION PLANS

### A. Project Readiness Activities

**Table 1: Project Processing Schedule**

Indicative Activity	2019	2020	2021						Responsible Party
	Jun-Dec	Jan-Dec	Jan	Feb	Mar	Apr	May	June	
Advance contracting actions									ADB, PEDO, PMU
Retroactive financing actions									ADB, MOF, EPD
Establish project implementation arrangements									ADB, AIIB, PEDO, PMU
ADB Board approval									ADB
AIIB Board approval									AIIB
ADB loan signing									ADB, MOF
AIIB signing									AIIB, MOF
Government legal opinion provided									Attorney General, MOF
Government budget inclusion									MOF, EPD
ADB loan effectiveness									ADB
AIIB loan effectiveness									AIIB

ADB = Asian Development Bank; AIIB = Asian Infrastructure Investment Bank, EPD = Energy and Power Department, Government of Khyber Pakhtunkhwa; MOF = Ministry of Finance; PEDO = Pakhtunkhwa Energy Development Organization, PMU = project management unit.

Source: Asian Development Bank.

### B. Overall Project Implementation Plan

7. Table 2 summarizes the project implementation schedule. Detailed procurement and implementation milestones are in Appendix 1.



### Table 2: Project Implementation Schedule

[illegible]

Indicative Activity	2019	2020	2021				2022				2023				2024				2025				2026				2027				2028	2029	
	Q4	Q1-Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1-Q4	Q1	Q2
4.2 Develop and implement livelihood improvement program																																	
4.3 Train PEDO in developing socially inclusive and gender-responsive energy projects																																	
B. Project Management Activities																																	
Fully establish PIU in PEDO																																	
Issue RFP for the PMC																																	
Award contract for the PMC																																	
Recruit external environmental and resettlement monitors																																	
Recruit community development NGO																																	
Start implementing environmental management, land acquisition and resettlement, gender action, and climate change adaptation and mitigation plans																																	
Semi-annual review missions																																	
Project completion report																																	

CPPA-G = Central Power Purchasing Agency; EPC = engineering, procurement, and construction; EPD = Energy and Power Department; IFB = invitation for bids; MW = megawatt; NGO = nongovernment organization; PEDO = Pakhtunkhwa Energy Development Organization, PMC = project management consultant, PIU = project implementation unit; Q = quarter; RFP = request for proposals.

### III. PROJECT MANAGEMENT ARRANGEMENTS

#### A. Project Implementation Organizations: Roles and Responsibilities

**Table 3: Summary of Project Implementation Roles and Responsibilities**

<b>Project Implementation Organizations</b>	<b>Management Roles and Responsibilities</b>
Borrower - Economic Affairs Division, Ministry of Finance	Borrower and loan recipient
Project oversight body – Government of Khyber Pakhtunkhwa	Energy and Power Department
Executing agency - Energy and Power Department, Government of Khyber Pakhtunkhwa	Responsible for overall project supervision and compliance with loan covenants.
Implementing agency – Pakhtunkhwa Energy Development Organization (PEDO)	Responsible for project implementation, procurement, design approval, monitoring and reporting, submission of withdrawal applications, progress reports, and audit reports to ADB Through the PIU, coordinate project implementation activities such as planning, procurement and contract management, financial management, and monitoring and evaluation.
PIU in PEDO	Procure and supervise implementation of the EPC contract for the hydropower plant, with assistance from the project management consultant. The PIU will be headed by a Project Director with offices in Peshawar and near dam site.
Asian Development Bank Asian Infrastructure Investment Bank	Financiers

EPC = engineering, procurement, and construction; PIU = project implementation unit.

Source: Asian Development Bank

#### B. Key Persons Involved in Implementation

Energy and Power Department  
Government of Khyber  
Pakhtunkhwa

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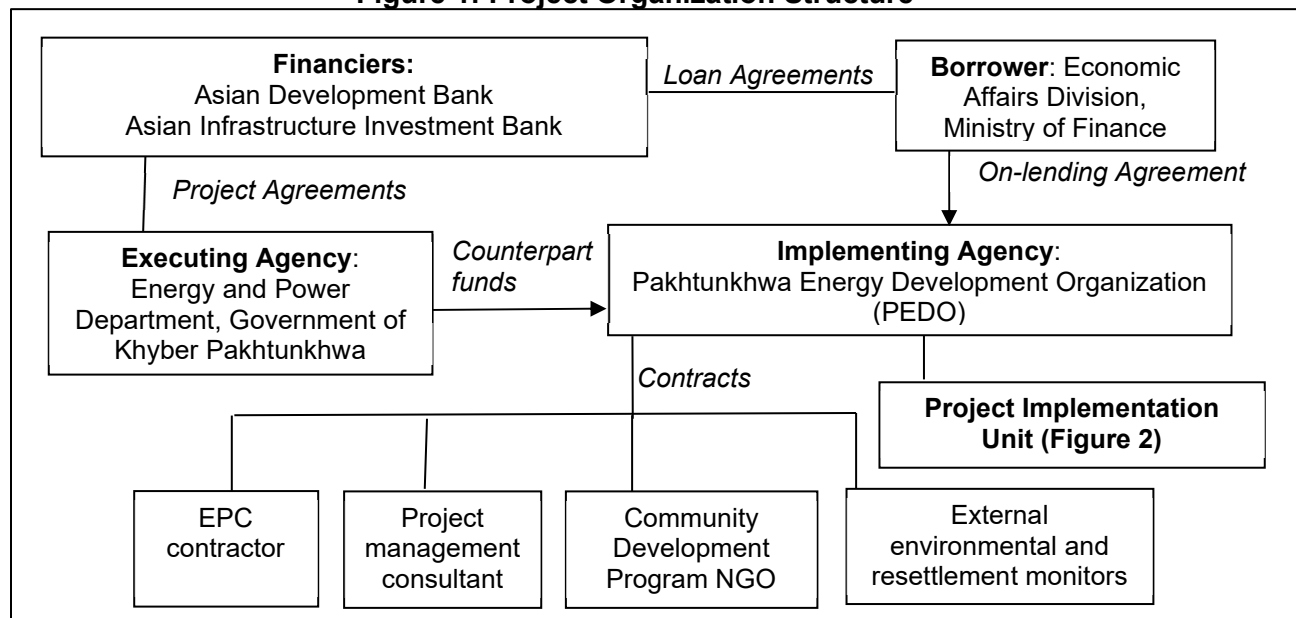
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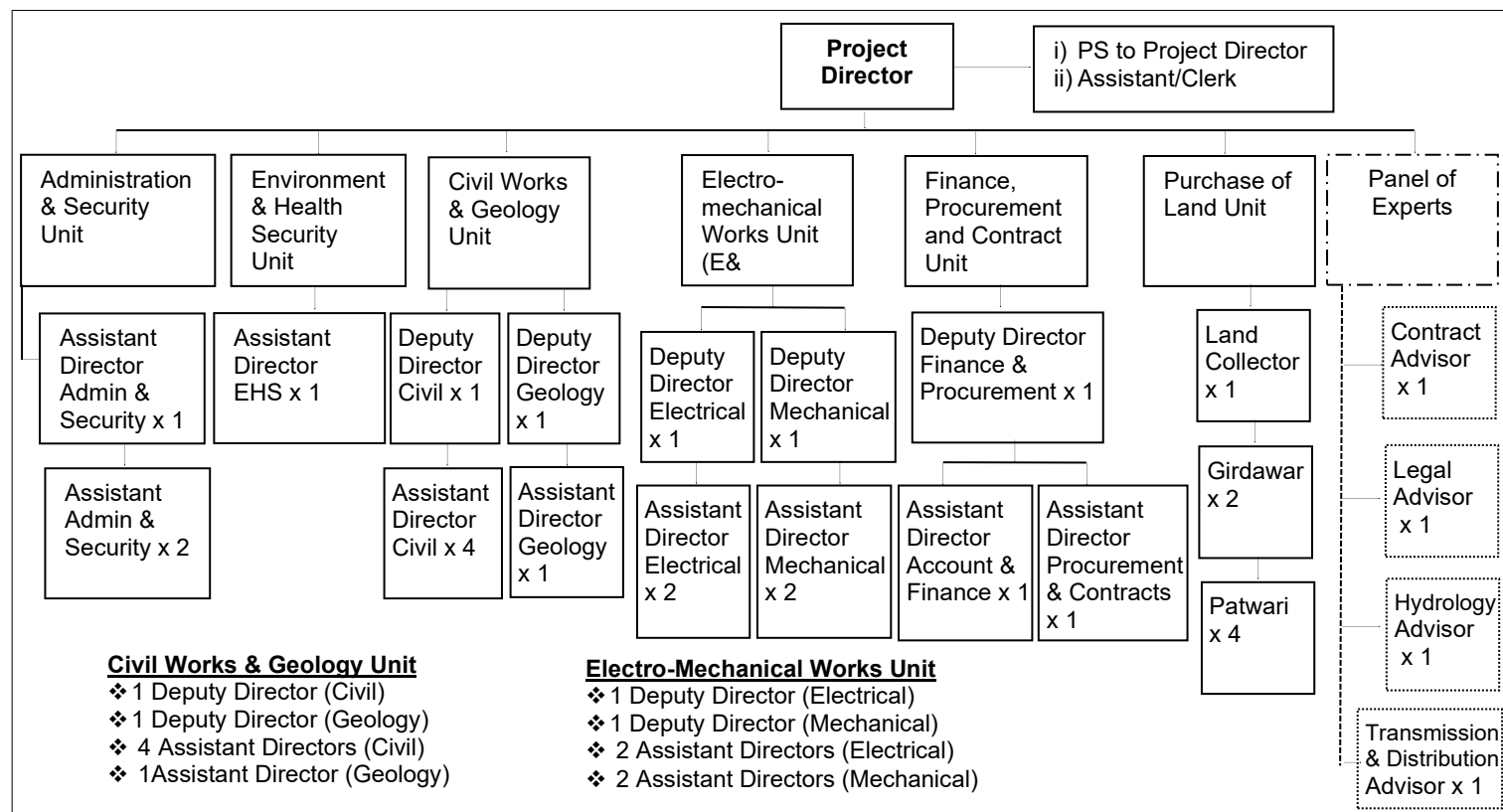
### C. Project Organization Structure

**Figure 1: Project Organization Structure**



EPC = engineering, procurement and construction; NGO = nongovernment organization

**Figure 2: Project Implementation Unit**



#### IV. COSTS AND FINANCING

8. The project costs cover the following:

- (i) turnkey engineering procurement and construction (EPC) contract financed by ADB, Asian Infrastructure Investment Bank (AIIB) and Energy and Power Department (EPD) on a cost sharing basis;
- (ii) environmental and social mitigation, and land acquisition financed by EPD;
- (iii) consulting services financed by ADB and EPD on a pro-rata basis determined by the ratio in the loan agreement. Consultants include the project management consultant (PMC); and other consultants for external environmental and resettlement monitoring, and community development (nongovernment organization, NGO);
- (iv) project management costs of the project implementation unit (PIU) in PEDO financed by EPD, including salaries; costs of vehicles; and renovation, furniture and information technology equipment for the PIU office;
- (v) taxes and duties financed by EPD; and
- (vi) interest during construction, and commitment charges capitalized into the loan and financed by ADB and AIIB.

##### A. Cost Estimates Preparation and Revisions

9. The project's base cost estimates were prepared by PEDO and the project preparatory technical assistance consultants based on technical due diligence and assessments. The cost estimates will be updated during project implementation.

##### B. Key Assumptions

10. The following key assumptions underpin the cost estimates and financing plan:

- (i) Exchange rate: Pakistan Rupees 160.10 = \$1.00 as of 16 January 2021.
- (ii) Price contingencies based on expected cumulative inflation over the implementation period are as follows:

**Table 4: Escalation Rates for Price Contingency Calculation**

Item	2021	2022	2023	2024	2025	2026	2027	2028	Average
Foreign rate of price inflation	1.5%	1.6%	1.7%	1.7%	1.8%	1.6%	1.6%	1.6%	1.6%
Domestic rate of price inflation	8.3%	7.0%	6.0%	6.0%	5.5%	5.5%	5.5%	5.5%	6.2%

Source: Asian Development Bank staff estimates.

### C. Detailed Cost Estimates by Expenditure Category

**Table 5: Detailed Cost Estimates by Expenditure Category (\$ million)**

Item	Foreign Exchange	Local Currency	Total Cost
<b>A. Base Cost <sup>a</sup></b>			
1 Turnkey (EPC) contract	63.7	479.9	543.6
a. Project preparatory works	-	41.4	41.4
b. Civil works and hydromechanical equipment	15.2	289.0	304.2
c. Electromechanical equipment and installation	44.5	133.5	178.0
d. Transmission system	4.0	16.0	20.0
2 Environment and social mitigation, and land acquisition	18.6	4.6	23.2
3 Consulting services	16.8	4.2	21.0
a. Project Implementation <sup>b</sup>	16.0	4.0	20.0
b. Others <sup>c</sup>	0.8	0.2	1.0
4 Project Management	-	5.1	5.1
5 Taxes and duties	-	52.6	52.6
<b>Subtotal (A): (1 + 2 + 3 + 4 + 5)</b>	<b>99.1</b>	<b>546.4</b>	<b>645.5</b>
<b>B. Contingencies <sup>d</sup></b>			
1 Physical	9.8	13.9	23.7
2 Price	3.8	25.5	29.3
<b>Subtotal (B)</b>	<b>13.6</b>	<b>39.4</b>	<b>53.0</b>
<b>C. Financing Charges During Implementation <sup>e</sup></b>			
1 Interest	52.7	0.0	52.7
2 Commitment Charges	3.8	0.0	3.8
<b>Subtotal (C)</b>	<b>56.5</b>	<b>0.0</b>	<b>56.5</b>
<b>Total (A+B+C)</b>	<b>169.2</b>	<b>585.8</b>	<b>755.0</b>

ADB = Asian Development Bank, AIIB = Asian Infrastructure Investment Bank, EPC = engineering, procurement and construction

Notes: Numbers may not sum precisely because of rounding.

<sup>a</sup> In mid-2019 prices.

<sup>b</sup> Includes construction supervision and project management.

<sup>c</sup> Includes external environmental and resettlement monitoring, and community development.

<sup>d</sup> Physical contingencies computed at 4.4% for the turnkey contract. Price contingencies computed at 5.7% on foreign exchange costs and 5.2% on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

<sup>e</sup> Includes interest and commitment charges and other fees to be incurred under the ADB and AIIB loans. Interest during construction for ADB ordinary capital resources (OCR) loan has been computed at the 5-year forward London interbank offered rate plus a spread of 0.5% and 0.1% of maturity premium. Commitment charges for ADB's OCR loan are 0.15% per year to be charged on the undisbursed loan amount.

Source: ADB estimates.

## D. Allocation and Withdrawal of Loan Proceeds

**Table 6.1: Allocation and Withdrawal of Loan Proceeds of Asian Development Bank (ADB) Loan**

Category		Total Amount	ADB Financing Basis
Number	Item	Allocated for ADB Financing	Percentage of ADB Financing from the Loan Account
1	Turnkey Contract <sup>a</sup>	\$233,700,000	85 percent of total amount due*
2	Consulting Services	17,900,000	85 percent of total amount due*
3	Unallocated	22,800,000	
4	Interest and Commitment Charges	25,600,000	100 percent of total amount due
	<b>Total</b>	<b>\$300,000,000</b>	

\*Exclusive of taxes and duties imposed within the territory of the Borrower.

a Category 1 (Turnkey Contract) will be jointly financed by ADB and Asian Infrastructure Investment Bank (AIIB). As both loans will not be made effective at the same time, ADB will finance 85% (exclusive of taxes and duties) of this category. Once the AIIB loan has been declared effective, the respective percentages for ADB and AIIB financing will be revised based on the remaining amounts to be financed for these categories 1 and 2 at the date of effectiveness of the AIIB loan (the final estimated financing percentage is 43% for ADB and 42% for AIIB).

Source: ADB estimates.

**Table 6.2: Allocation and Withdrawal of Loan Proceeds of Asian Infrastructure Investment Bank (AIIB) Loan**

Category		Total Amount	AIIB Financing Basis
Number	Item	Allocated for AIIB Financing	Percentage of AIIB Financing from the Loan Account
1	Turnkey Contract <sup>a</sup>	\$226,800,000	42 percent of total amount due*
2	Unallocated	22,300,000	
3	Interest and Commitment Charges	30,900,000	100 percent of total amount due
	<b>Total</b>	<b>\$280,000,000</b>	

\*Exclusive of taxes and duties imposed within the territory of the Borrower.

a Category 1 (Turnkey Contract) will be jointly financed by Asian Development Bank (ADB) and AIIB. As both loans will not be made effective at the same time, the ADB loan will be front loaded and will finance 85% of the turnkey contract, exclusive of taxes and duties. Once the AIIB loan has been declared effective, the respective percentages for ADB and AIIB financing will be revised based on the remaining amounts to be financed for the turnkey contract at the date of effectiveness of the AIIB loan. The final estimated financing percentage is 43% for ADB and 42% for AIIB).

Source: ADB estimates.

E. Detailed Cost Estimates by Financier

Table 7: Detailed Cost Estimates by Financier (\$ million)

Item	ADB		AIIB		Energy and Power Department		Total Cost
	Amount (A)	% of cost category (A)/(F)	Amount (D)	% of cost category (D)/(F)	Amount (E)	% of cost category (E)/(F)	
<b>A. Base Cost</b>							
1 Turnkey	233.7	43%	226.8	42%	83.1	15%	543.6
a. Project preparatory works	17.8	43%	17.3	42%	6.3	15%	41.4
b. Civil works and hydromechanical equipment	130.8	43%	126.9	42%	46.5	15%	304.2
c. Electromechanical equipment and installation	76.5	43%	74.3	42%	27.2	15%	178.0
d. Transmission system	8.6	43%	8.3	42%	3.1	15%	20.0
2 Environment and social mitigation, and land acquisition	-	0%	-	0%	23.2	100%	23.2
3 Consulting services	17.9	85%	-	0%	3.1	15%	21.0
a. Project Implementation	17.0	85%	-	0%	3.0	15%	20.0
b. Others	0.9	85%	-	0%	0.1	15%	1.0
4 Project Management	-	0%	-	0%	5.1	100%	5.1
5 Taxes and duties	-	0%	-	0%	52.6	100%	52.6
<b>Subtotal (A): (1 + 2 + 3 + 4 + 5)</b>	<b>251.6</b>	<b>39%</b>	<b>226.8</b>	<b>35%</b>	<b>167.1</b>	<b>26%</b>	<b>645.5</b>
<b>B. Contingencies <sup>d</sup></b>							
1 Physical	10.2	43%	10.0	42%	3.5	15%	23.7
2 Price	12.6	43%	12.3	42%	4.4	15%	29.3
<b>Subtotal (B)</b>	<b>22.8</b>	<b>43%</b>	<b>22.3</b>	<b>42%</b>	<b>7.9</b>	<b>15%</b>	<b>53.0</b>
<b>C. Financing Charges During Implementation</b>							
1 Interest	24.1	46%	28.6	54%	-	0%	52.7
2 Commitment Charges	1.5	39%	2.3	61%	-	0%	3.8
<b>Subtotal (C)</b>	<b>25.6</b>	<b>45%</b>	<b>30.9</b>	<b>55%</b>	<b>-</b>	<b>0%</b>	<b>56.5</b>
<b>Total (A+B+C)</b>	<b>300.0</b>	<b>40%</b>	<b>280.0</b>	<b>37%</b>	<b>175.0</b>	<b>23%</b>	<b>755.0</b>

ADB = Asian Development Bank, AIIB = Asian Infrastructure Investment Bank.

Note: Numbers may not sum precisely because of rounding.

Source: ADB estimates.



## F. Detailed Cost Estimates by Component

**Table 8: Detailed Cost Estimates by Component (\$ million)**

Item	<u>Total Cost</u>	<u>Turnkey</u> Amount	% of Cost Category	<u>Others</u> Amount	% of Cost Category	<u>Project Management</u>	
						Amount	% of Cost Category
<b>A. Base Cost</b>							
1 Turnkey	543.6	543.6	100%	-	0%	-	0%
a. Project preparatory works	41.4	41.4	100%				
b. Civil works and hydromechanical equipment	304.2	304.2	100%	-	0%	-	0%
c. Electromechanical equipment and installation	178.0	178.0	100%	-	0%	-	0%
d. Transmission system	20.0	20.0	100%	-	0%	-	0%
2 Environment and social mitigation, and land acquisition	23.2	23.2	100%	-	0%	-	0%
3 Consulting services	21.0	-	0%	21.0	100%	-	0%
a. Project Implementation	20.0	-	0%	20.0	100%	-	0%
b. Others	1.0	-	0%	1.0	100%	-	0%
4 Project Management	5.1	-	0%	-	0%	5.1	100%
5 Taxes and duties	52.6	52.6	100%	-	0%	-	0%
<b>Subtotal (A): (1 + 2 + 3 + 4 + 5)</b>	<b>645.5</b>	<b>619.4</b>	<b>96%</b>	<b>21.0</b>	<b>3%</b>	<b>5.1</b>	<b>1%</b>
<b>B. Contingencies</b>							
1 Physical	23.7	23.7	100%	-	0%	-	0%
2 Price	29.3	29.3	100%	-	0%	-	0%
<b>Subtotal (B)</b>	<b>53.0</b>	<b>53.0</b>	<b>100%</b>	<b>-</b>	<b>0%</b>	<b>-</b>	<b>0%</b>
<b>C. Financing Charges During Implementation</b>							
1 Interest	52.7	52.7	100%	-	0%	-	0%
2 Commitment Charges	3.8	3.8	100%	-	0%	-	0%
<b>Subtotal (C)</b>	<b>56.5</b>	<b>56.5</b>	<b>100%</b>	<b>-</b>	<b>0%</b>	<b>-</b>	<b>0%</b>
<b>Total (A+B+C)</b>	<b>755.0</b>	<b>728.9</b>	<b>97%</b>	<b>21.0</b>	<b>3%</b>	<b>5.1</b>	<b>1%</b>

Note: Numbers may not sum precisely because of rounding.

Source: Asian Development Bank estimates.

**G. Detailed Cost Estimates by Year****Table 9: Detailed Cost Estimates by Year (\$ million)**

Item	Total Cost	Year 1 2021	Year 2 2022	Year 3 2023	Year 4 2024	Year 5 2025	Year 6 2026	Year 7 2027
<b>A. Base Cost</b>								
1 Turnkey	543.6	111.7	49.4	73.4	66.8	137.1	57.0	48.2
a. Project preparatory works	41.4	-	4.1	8.3	8.3	14.5	6.2	-
b. Civil works and hydromechanical equipment	304.2	76.1	30.4	30.4	45.6	76.1	15.2	30.4
c. Electromechanical equipment and installation	178.0	35.6	8.9	26.7	8.9	44.5	35.6	17.8
d. Transmission system	20.0	-	6.0	8.0	4.0	2.0	-	-
2 Environment and social mitigation, and land acquisition	23.2	11.6	11.6	-	-	-	-	-
3 Consulting services	21.0	3.2	2.2	4.2	4.2	4.2	1.0	2.0
a. Project Implementation	20.0	3.0	2.0	4.0	4.0	4.0	1.0	2.0
b. Others	1.0	0.2	0.2	0.2	0.2	0.2	-	-
4 Project Management	5.1	0.3	0.8	1.0	1.0	1.0	0.5	0.5
5 Taxes and duties	52.6	6.9	7.2	12.1	5.9	10.8	6.4	3.3
<b>Subtotal (A): (1 + 2 + 3 + 4 + 5)</b>	<b>645.5</b>	<b>133.7</b>	<b>71.2</b>	<b>90.7</b>	<b>77.9</b>	<b>153.1</b>	<b>64.9</b>	<b>54.0</b>
<b>B. Contingencies</b>								
1 Physical	23.7	-	-	-	-	-	-	23.7
2 Price	29.3	-	-	-	-	-	-	29.3
<b>Subtotal (B)</b>	<b>53.0</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>53.0</b>
<b>C. Financing Charges During Implementation</b>								
1 Interest	52.7	1.50	3.6	5.3	7.2	10.0	12.1	13.0
2 Commitment Charges	3.8	1.0	0.8	0.7	0.6	0.4	0.2	0.1
<b>Subtotal (C)</b>	<b>56.5</b>	<b>2.5</b>	<b>4.4</b>	<b>6.0</b>	<b>7.8</b>	<b>10.4</b>	<b>12.3</b>	<b>13.1</b>
<b>Total (A+B+C)</b>	<b>755.0</b>	<b>136.2</b>	<b>75.6</b>	<b>96.7</b>	<b>85.7</b>	<b>163.5</b>	<b>77.2</b>	<b>120.1</b>

Note: Numbers may not sum precisely because of rounding.

Source: Asian Development Bank estimates.

## H. Contract and Disbursement S-Curves for ADB Financing

**Table 10: Quarterly Contract Award and Disbursement Projections (\$ million)**

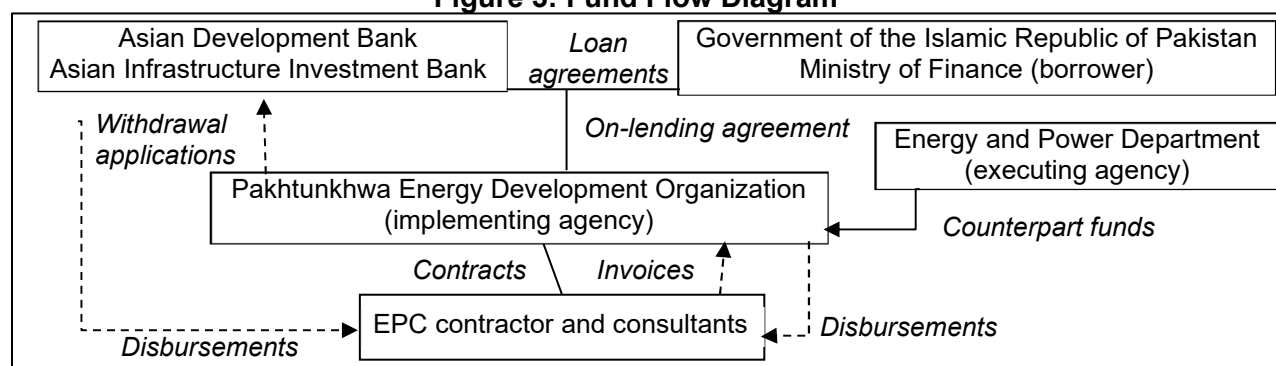
Year	Contract Awards <sup>a</sup>					Disbursements				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
2021	251.6				251.6			49.7	0.9	50.7
2022							9.2	9.1	4.7	23.0
2023						3.5	28.1	3.5	0.0	35.1
2024						1.8	4.4	8.3	17.8	32.3
2025						2.6	25.4	0.0	34.5	62.5
2026						0.0	22.8	2.7	0.0	25.4
2027						7.7	7.4	6.5	0	21.6
2028		22.8			22.8	0.0	0.0	0.0	23.6	23.6
<b>Total</b>					<b>274.4</b>					<b>274.4</b>

Note: The projected contract awards include contingencies/unallocated amounts in Q2 2028 and exclude financing charges during implementation.

Source: Asian Development Bank estimates.

## I. Fund Flow Diagram

**Figure 3: Fund Flow Diagram**



EPC = engineering, procurement, and construction

Note: Consultants include for project management, external resettlement monitoring, and community development (nongovernment organization).

Source: Asian Development Bank.

## V. FINANCIAL MANAGEMENT

### A. Financial Management Assessment

11. The financial management assessment (FMA) was conducted in March 2019 in accordance with ADB's *Guidelines for the Financial Management and Analysis of Projects* (2005), and the *Financial Due Diligence: A Methodology Note* (2009).<sup>3</sup> The FMA considered the capacity of EPD and PEDO, including funds-flow arrangements, staffing, accounting and financial reporting systems, financial information systems, and internal and external auditing arrangements.

12. The FMA found that PEDO has basic financial and accounting policy; and applies cash accounting, double-entry bookkeeping and other generally accepted accounting principles and conventions which comply with national standards. The key financial management risks identified

<sup>3</sup> The guidelines and methodology note are available in <https://www.adb.org/documents/financial-management-and-analysis-projects> and <https://www.adb.org/documents/financial-due-diligence-methodology-note>.

are the delayed adoption of accounting policy and procedures that comply with international financial reporting standards (IFRS), and automation of accounting and reporting. The overall pre-mitigation financial management risk of EPD and PEDO is substantial.

13. The borrower, EPD and PEDO have agreed to implement the financial management action plan in Table 11 with key measures to address the above deficiencies. PEDO needs to enhance their capacity in maintaining accrual-based accounting and preparing comprehensive IFRS-compliant financial statements comprising income and cash flow statements, balance sheets, and detailed supplementary information on its finances and accounts. PEDO also needs to pilot and deploy enterprise resource planning. They will appoint an experienced financial management specialist in the PMU to assist them in developing these functions and train local staff.

**Table 11: Financial Management Action Plan**

<b>Risk</b>	<b>Action</b>	<b>Responsibility</b>	<b>Resources</b>	<b>Timing</b>
Delayed disclosure of IFRS-compliant accounting policies, procedures, and systems	Engage financial management specialist in PMU to assist in maintaining and timely disclosure of accrual-based and IFRS-compliant accounting	PEDO's finance unit	PEDO's internal resources	2021–2023
Delayed implementation of automated information system and reporting	Train accounting staff to improve their reporting capacity Develop ERP and MIS to improve accounting infrastructure of the company	PMU and PEDO's information technology department	PEDO's internal resources	2021–2022

ERP = enterprise resource planning, IFRS = international financial reporting standards, MIS = management information system, PEDO = Pakhtunkhwa Energy Development Organization, PMU = project management unit.

## **B. Disbursement**

### **1. Disbursement Arrangements for ADB**

14. Loan proceeds will be disbursed following ADB's *Loan Disbursement Handbook* (2017, as amended from time to time),<sup>4</sup> and detailed arrangements agreed upon between the government and ADB. Online training on disbursement policies and procedures is available.<sup>5</sup> The PIU is encouraged to avail of this training to help ensure efficient disbursement and fiduciary control.

15. The project will primarily use direct payment and commitment procedures for the EPC contract. For the consulting services, direct payment method will be used. Reimbursement method may be used when necessary. All invoices will be financed by ADB, AIIB and EPD on a cost sharing basis determined by the ratio/share in the loan agreements. The PIU, assisted by the PMC, will prepare disbursement projections; and prepare and send withdrawal applications to ADB for the ADB-financed portions, and AIIB for the AIIB-financed portions or as determined in the co-financing agreement between ADB and AIIB.

16. Before submitting the first withdrawal application, the Economic Affairs Division should submit to ADB sufficient evidence of the authority of the person(s) who will sign the withdrawal applications on behalf of the government (borrower), together with the authenticated specimen signatures of each authorized person. The minimum value per withdrawal application is stipulated

<sup>4</sup> The handbook is available in <https://www.adb.org/documents/loan-disbursement-handbook>.

<sup>5</sup> Disbursement eLearning. [http://wpqr4.adb.org/disbursement\\_elearning](http://wpqr4.adb.org/disbursement_elearning)

in the *Loan Disbursement Handbook* (2017, as amended from time to time). Individual payments below such amount should be paid by PEDO and subsequently claimed to ADB and AIIB through reimbursement, unless otherwise accepted by ADB and AIIB. The borrower should ensure sufficient category and contract balances before requesting disbursements. Use of ADB's Client Portal for Disbursements<sup>6</sup> system is encouraged for submitting withdrawal applications to ADB.

17. For disbursements from AIIB funds partially administered by ADB, the arrangements for submission of withdrawal application will be finalized during co-financing agreement negotiations.

18. The EPC contract will be jointly financed by ADB and AIIB. As both loans will not be made effective at the same time, the ADB loan will be front loaded and will finance 85% (exclusive of taxes and duties) of the EPC contract. Once the AIIB loan has been declared effective, the respective percentages for ADB and AIIB financing will be revised based on the remaining amounts to be financed for the EPC contract at the date of effectiveness of the AIIB loan. The final estimated financing percentage is 43% for ADB and 42% for AIIB.

## **2. Disbursement Arrangements for Counterpart Fund**

19. No withdrawals shall be made from the loan account for the turnkey EPC until a loan agreement between ADB and the borrower, and a related on-lending agreement between the borrower and PEDO, both for the purposes of the project and in form and substance satisfactory to ADB, shall have been duly executed and become effective in accordance with their terms.

20. EPD will ensure necessary budgetary allocations for their counterpart funds to be disbursed by PEDO, through the PMU. The PMU will receive and process the invoices from the EPC contractor and consultants. Before making payments, PEDO as withholding agent, will deduct the applicable tax following sections 151 and 153 of the Income Tax Ordinance (2001, as amended from time to time), and deposit the tax to the government treasury as applicable.

## **C. Accounting**

21. PEDO will maintain, or cause to be maintained, separate books and records by funding source for all expenditures incurred on the project following cash-based accounting system following the government's financial regulations. PEDO will prepare project financial statements in accordance with the government's accounting laws and regulations which are consistent with international accounting principles and practices.

## **D. Auditing and Public Disclosure**

22. PEDO will cause the detailed project financial statements to be audited in accordance with International Standards on Auditing, by an independent auditor acceptable to ADB. The audited project financial statements (APFS) together with the auditor's opinion will be presented in the English language to ADB within 6 months from the end of the fiscal year by PEDO.

23. PEDO's audited entity financial statements, together with the auditor's report and management letter, will be submitted in the English language to ADB within 1 month after their approval by the relevant authority.

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<sup>6</sup> The portal facilitates online submission of withdrawal applications to ADB, resulting in faster disbursement. The forms to be completed by the Borrower are available online at <https://www.adb.org/documents/client-portal-disbursements-guide>.

24. The audit report for the project financial statements will include a management letter and auditor's opinions, which cover whether the (i) project financial statements present an accurate and fair view or are presented fairly, in all material respects, in accordance with the applicable financial reporting standards; (ii) proceeds of the loan were used only for the purpose(s) of the project; and (iii) borrower or PEDO was in compliance with the financial covenants contained in the legal agreements (where applicable).

25. Compliance with financial reporting and auditing requirements will be monitored by review missions and during normal program supervision, and followed up regularly with all concerned, including the external auditor.

26. The government, EPD and PEDO have been made aware of ADB's approach to delayed submission, and the requirements for satisfactory and acceptable quality of the APFS.<sup>7</sup> ADB reserves the right to require a change in the auditor (in a manner consistent with the constitution of the borrower), or for additional support to be provided to the auditor, if the audits required are not conducted in a manner satisfactory to ADB, or if the audits are substantially delayed. ADB reserves the right to verify the project's financial accounts to confirm that the share of ADB's financing is used in accordance with ADB's policies and procedures.

27. Public disclosure of the APFS, including the auditor's opinion on the project financial statements, will be guided by ADB's Access to Information Policy 2018.<sup>8</sup> After the review, ADB will disclose the APFS and the opinion of the auditors on the project financial statements no later than 14 days of ADB's confirmation of their acceptability by posting them on ADB's website. The management letter, additional auditor's opinions, and audited entity financial statements will not be disclosed.<sup>9</sup>

## VI. PROCUREMENT AND CONSULTING SERVICES

### A. Advance Contracting and Retroactive Financing

28. All advance contracting and retroactive financing will be undertaken following *ADB Procurement Policy* (2017, as amended from time to time) and *Procurement Regulations for ADB Borrowers: Goods, Works, Nonconsulting and Consulting Services* (2017, as amended from time to time). Invitations to bid under advance contracting and retroactive financing will be issued subject to ADB approval. The borrower, EPD and PEDO have been advised that approval of advance contracting and retroactive financing does not commit ADB and AIIB to finance the project.

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<sup>7</sup> ADB's approach and procedures regarding delayed submission of audited project financial statements (APFS):

- (i) When APFS are not received by the due date, ADB will write to the executing agency advising that (a) the audit documents are overdue; and (b) if they are not received within the next 6 months, requests for new contract awards and disbursement such as new replenishment of advance accounts, processing of new reimbursement, and issuance of new commitment letters will not be processed.
- (ii) When APFS are not received within 6 months after the due date, ADB will withhold processing of requests for new contract awards and disbursement such as new replenishment of advance accounts, processing of new reimbursement, and issuance of new commitment letters. ADB will (a) inform the executing agency of ADB's actions; and (b) advise that the loan may be suspended if the audit documents are not received within the next 6 months.
- (iii) When APFS are not received within 12 months after the due date, ADB may suspend the loan.

<sup>8</sup> ADB. 2018. [Access to Information Policy](#). Manila.

<sup>9</sup> This type of information would generally fall under the information policy exceptions to disclosure. ADB. 2018. [Access to Information Policy](#). Chapter III.B.

29. **Advance contracting.** Advance contracting will apply up to contract award for the (i) EPC contract for the hydropower plant, including the related civil works from river diversion up to transmission point, and (ii) recruitment of the PMC.

30. **Retroactive financing.** ADB may finance eligible expenditures for up to \$60 million or 20% of the loans incurred before loan effectiveness and within 12 months before loan signing.

## **B. Procurement of Goods, Works, and Consulting Services**

31. Procurement of goods, works and consulting services financed under the loan will follow the *ADB Procurement Policy* (2017, as amended from time to time) and *Procurement Regulations for ADB Borrowers* (2017, as amended from time to time). An 18-month procurement plan indicating thresholds and review procedures for goods, works and consulting services contract packages is in Section C. The procurement plan will be updated yearly or as necessary. Before the start of any procurement, ADB and the government will review the public procurement laws of the central and state governments to ensure consistency with the *ADB Procurement Policy*.

32. **Works.** Open competitive bidding (OCB, international), using single-stage, two-envelope procedure will be followed for the procurement of civil works and goods on a turnkey basis. The works shall be completed over a period of 6.25 years for a total cost estimate of \$600 million, including taxes, but excluding contingencies. ADB's standard bidding document for Plant - design, supply and installation (June 2018) was used. PEDO will also procure and finance contracts for vehicles, PMU office renovation and furniture, and information technology equipment using the government's procurement rules.

33. **Consulting services.**<sup>10</sup> PEDO will recruited the PMC through OCB using the quality-and cost-based selection method with quality-cost ratio of 90:10 and international advertising. Around 1,240 person-months (135 international and 1,105 national) are required. The PMC will provide technical, managerial and contractual support to PEDO during the entire cycle of the project, from the bidding phase, through construction, up to commissioning and first year of operation. The PMC will also be responsible to review and approve the design and monitor the construction process including invoice approval on behalf of PEDO. The PMC's terms of reference (TORs) are in Appendix 2.

34. PEDO will also recruit an NGO to implement the community development program (56 person-months) using quality-based selection method. Individual consultants will be engaged as external monitors for environment (9 person-months) and resettlement (6 person-months). The three consultancies will be nationally advertised. The TORs are in Appendixes 3 to 5.

35. As the AIIB cofinancing will be partially administered by ADB, universal procurement will apply for all contracts, except for the project management consultant.<sup>11</sup>

<sup>10</sup> Checklists for actions required to contract consultants by method are available in the e-Handbook on Project Implementation at <http://www.adb.org/documents/handbooks/project-implementation/>

<sup>11</sup> ADB. 2015. *Enhancing Operational Efficiency of the Asian Development Bank*. Manila. Universal procurement has not been applied for the advance actions for the project management consultant as the request for proposals was issued to the shortlisted firms before AIIB cofinancing was confirmed.

## C. Procurement Plan

### Basic Data

<b>Project Procurement Classification:</b> Category B	<b>Implementing Agency:</b> Pakhtunkhwa Energy Development Organization	
<b>Project Procurement Risk:</b> Medium		
<b>Procurement Plan Duration (in months):</b> 18	<b>Advance Contracting:</b> No	<b>e-GP:</b> No

### 1. Methods, Review and Procurement Plan

36. Except as ADB may otherwise agree, the following methods shall apply to procurement of goods, works, and consulting services.

Method	Comments
<b>Procurement of Goods and Works</b>	
Open Competitive Bidding for Goods	Government-financed, national advertisement
Open Competitive Bidding for Works	Prior review, international advertisement.
<b>Consulting Services</b>	
Quality- and Cost-Based Selection for Consulting Firm	Prior review, national advertisement
Quality-Based Selection for Consulting Firm	Prior review, national advertisement
Competitive for Individual Consultant	Prior review, national advertisement

### 2. Lists of Active Procurement Packages (Contracts)

37. The table lists goods, works, and consulting services contracts for which the procurement activity is either ongoing or expected to commence within the procurement plan duration.

Package Number	General Description	Estimated Value (\$)	Procurement/ Selection Method	Review	Bidding Procedure/ Type of Technical Proposal	Advertisement (quarter/ year)	Comments
<b>Goods and Works</b>							
1	Design, supply, installation, testing and commissioning of 300-megawatt Balakot hydropower plant, including related civil works from river diversion up to transmission point	600,000,000	Open competitive bidding	Prior	One-stage, two-envelope bidding procedure	Quarter 4 / 2019	Advertising: International No. of contracts: 1 Prequalification of Bidders: No Domestic Preference Applicable: Yes Bidding Document: Plant To be financed by ADB, AIIB and EPD. Contract estimate includes taxes and duties, and excludes contingencies. Universal procurement applies.
2	Project management consultant	20,000,000	Quality-and-cost-based selection	Prior	Full Technical Proposal	Quarter 2 / 2019	Type: Firm Assignment: International Quality-Cost Ratio: 90:10

ADB = Asian Development Bank; AIIB = Asian Infrastructure Investment Bank; EPD = Energy and Power Department, Government of Khyber Pakhtunkhwa



### 3. List of Indicative Packages (Contracts) Required Under the Project

38. The table lists goods, works, and consulting services contracts for which procurement activity is expected to commence beyond the procurement plan duration and over the life of the project.

Consulting Services						
Package Number	General Description	Estimated Value (\$)	Selection Method	Review	Type of Proposal	Comments
3	Community development program nongovernment organization	700,000	Quality-based selection	Prior	Simplified Technical Proposal	Type: Firm Advertising: National Universal procurement applies.
4	External environmental monitor	180,000	Individual consultant selection	Prior	Not applicable	Type: Individual Advertising: National Expertise: environmental management and monitoring, safeguards Universal procurement applies.
5	External resettlement monitor	120,000	Individual consultant selection	Prior	Not applicable	Type: Individual Advertising: National Expertise: resettlement Universal procurement applies.

### 4. Non-ADB Financing

39. The table lists goods, works, and consulting services contracts over the life of the project, financed by non-ADB sources.

Goods and Works				
General Description	Estimated Value (cumulative \$)	Estimated Number of Contracts	Procurement Method	Comments
Vehicles	400,000.00	1	Open competitive bidding	National advertising

### 5. Open Competitive Bidding, Nationally Advertised

40. The procedures to be followed for OCB nationally advertised shall be those set forth in the Public Procurement Rules 2014 (SO.(FR)/FD/9-7/2010/Volume-II issued on 3 February 2014 by the Khyber Pakhtunkhwa Public Procurement Regulatory Authority Act 2012 of the government of Khyber Pakhtunkhwa Province) with the clarifications and modifications described in the following paragraphs required for compliance with the provisions of the ADB Procurement Regulations.

41. **Registration.** Bidding shall not be restricted to pre-registered firms and such registration shall not be a condition for participation in the bidding process. Where registration is required prior to award of contract, bidders shall (i) be allowed a reasonable time to complete the registration process, and (ii) not be denied registration for reasons unrelated to their capability and resources to successfully perform the contract, which shall be verified through post-qualification.

42. **Prequalification.** Normally, post-qualification shall be used unless prequalification is

explicitly provided for in the loan agreement/procurement plan. Irrespective of whether post qualification or prequalification is used, eligible bidders (both national and foreign) shall be allowed to participate.

43. **Bidding period.** The minimum bidding period is 28 days prior to the deadline for the submission of bids.

44. **Bidding documents.** Procuring entities shall use the applicable standard bidding documents for the procurement of goods, works and services acceptable to ADB.

45. **Preferences.** No domestic preference shall be given for domestic bidders and domestically manufactured goods.

46. **Advertising.** Invitations to bid shall be advertised in at least one widely circulated national daily newspaper or freely accessible, nationally known website allowing a minimum of 28 days for the preparation and submission of bids. Contracts estimated to cost \$500,000 or more for goods and related services, and \$1,000,000 or more for civil works will be advertised on ADB's website via the posting of the Procurement Plan.

47. **Bid security.** Where required, bid security shall be in the form of a bank guarantee from a reputable bank.

48. **Bid opening and bid evaluation.** Bids shall be opened in public. Bid evaluation shall be made in strict adherence to the criteria declared in the bidding documents and contracts shall be awarded to the lowest evaluated bidder. Bidders shall not be eliminated from detailed evaluation on the basis of minor, non-substantial deviations. No bidder shall be rejected on the basis of a comparison with the employer's estimate and budget ceiling without the ADB's prior concurrence. A contract shall be awarded to the technically responsive bid that offers the lowest evaluated price and no negotiations shall be permitted.

49. **Rejection of all bids and rebidding.** Bids shall not be rejected and new bids solicited without ADB's prior concurrence.

50. **Participation by government-owned enterprises.** Government-owned enterprises in the Islamic Republic of Pakistan shall be eligible to participate as bidders only if they can establish that they are legally and financially autonomous, operate under commercial law and are not a dependent agency of the contracting authority. Furthermore, they will be subject to the same bid and performance security requirements as other bidders.

## VII. SAFEGUARDS

51. **Environment.** Following ADB's *Safeguard Policy Statement* (2009), the project is categorized A for environment. Following the Safeguard Policy Statement, an environmental impact assessment (EIA), including an environmental management plan (EMP) was prepared by PEDO in November 2018, and disclosed. The procedure for obtaining environmental approval from the Khyber Pakhtunkhwa Environmental Protection Agency has been initiated.

52. To ensure compliance with the Safeguard Policy Statement and national environmental legislation, PEDO, through the PMU, will follow the EIA and EMP. The PIU will ensure that:

- (i) adequate financial and qualified human resources are available in PEDO to

- (ii) implement and manage ADB's environmental safeguards requirements;
- (iii) environmental safeguard due diligence and disclosure requirements are met following the Safeguard and Policy Statement and government requirements;
- (iv) updated EIA and EMP are prepared for the detailed design as required under the Safeguard and Policy Statement;
- (v) EIA is submitted to the Khyber Pakhtunkhwa Environmental Protection Agency, and environmental approval is obtained before contract award;
- (vi) updated EIA report is submitted to ADB for review and disclosure;
- (vii) EMPs are included in the bidding document of the EPC contract;
- (viii) EMP implementation and environmental management costs are included in the bill of quantities;
- (ix) EPC contractor prepares and submit site-specific EMP/s to PIU for approval at least 10 days before taking possession of any work site, and implements the site-specific EMPs;
- (x) no access to the site will be given to the EPC contractor until the site-specific EMPs are approved by the PIU;
- (xi) implementation of the site-specific EMPs is regularly monitored through the PIU;
- (xii) non-compliance notice will be issued to the EPC contractor if the PIU requires action to be taken. The EPC contractor is required to prepare a corrective action plan which is to be implemented by a date agreed with the PIU;
- (xiii) the EIA, EMP and environmental ~~SEP~~ monitoring reports are disclosed on PEDO's website;
- (xiv) in case of unpredicted environmental impacts occurring during project implementation, corrective action plans are prepared and implemented; and
- (xv) semi-annual environmental monitoring reports are submitted to ADB within 1 month after the reporting period.

53. The PMC will have a qualified environmental expert that will (i) supervise and monitor implementation of the EMP and site-specific EMPs; (ii) prepare training materials and implement capacity building programs for PEDO, PIU and contractors; and (iii) directly report on environmental management performance to the resident engineer. An external environmental monitor will be recruited for independent environmental monitoring during the construction phase (TOR are in Appendix 3).

54. ADB will (i) monitor and supervise activities until the project completion report (PCR) is issued; (ii) field review missions, including site visits to ascertain the status of implementing of the EMP with detailed review by ADB's safeguard specialists, officers and/or consultants; and (iii) review updated EIA and semi-annual environmental monitoring reports and disclose them on the ADB website on time.

55. **Land acquisition and resettlement.** The project is categorized A per the Safeguards Policy Statement. A draft land acquisition and resettlement plan (LARP) was approved by ADB and disclosed.<sup>12</sup> PEDO shall ensure that the draft LARP will be updated based on the detailed design and approved final alignment and project boundaries following ADB's involuntary resettlement safeguards, and following the notification under Sections 4 and 5 of the Pakistan Land Acquisition Act. PEDO shall ensure that the updated LARP will not involve any lowering of the standards and entitlements provided in the approved draft LARP is based on an updated assessment of impacts, follow-up meaningful consultation with displaced persons, and valuation of affected assets.

<sup>12</sup> The draft LARP is also a linked document to the Report Recommendation of the President.

56. Since the project will be implemented through an EPC contract, the installation and construction phase (and commencement thereof) will be conditional to: (i) submission to ADB of a timebound action plan for updating the LARP; (ii) the submission to and clearance by ADB of a final LARP based on detailed design; and (iii) PEDO's notification to the EPC contractor and ADB in writing that due consultation, compensation payments and other entitlements have been provided to affected people fully in accordance with the approved final LARP as verified by an external resettlement monitor (TOR are in Appendix 4). PEDO will ensure that notice-to-proceed with civil works in the sections with LAR impacts will only be issued after (i) full implementation of the compensation program described in the final LARP including the full delivery of compensation to the displaced persons, and (ii) preparation/submission of a compliance report by the external resettlement monitor.

57. The PIU will be responsible for coordinating with the revenue department, and updating, implementation and monitoring of the final LARP and the livelihood restoration and improvement activities, with support from the PMC and the NGO who will implement the social uplifting program. Specifically, the PIU will:

- (i) Coordinate with the board of revenue in conducting detailed measurement surveys, and oversee the conduct census of all displaced persons and socioeconomic surveys.
- (ii) Ensure that calculation of compensation and assistance follows the policy provisions in the LARP.
- (iii) Conduct regular consultations with displaced persons in preparing and implementing the LARP and livelihood restoration activities.
- (iv) Prepare the final LARP and livelihood restoration activities for ADB review, including any subsequent update or corrective actions in case of emerging or unforeseen impacts, as required.
- (v) Set up the mechanism for assessing and disbursing compensation and assistance required in the LARP that are not covered in the land award provided by the revenue department.
- (vi) Disclose the final LARP and livelihood restoration activities to the displaced persons after translating the summary of LARP in local language (Urdu/Pashtu).
- (vii) Ensure the timely formation and orientation of the Grievance Redress Committee for community complaints resolution, and help facilitate the effective resolution of grievances.
- (viii) Facilitate effective LARP implementation, including the livelihood restoration activities.
- (ix) Ensure the timely engagement and mobilization of the external resettlement monitor.
- (x) Regularly and timely submit semi-annual internal and external monitoring reports to ADB for review and disclosure, and follow-up on issues and recommendations noted in the monitoring reports.
- (x) Inform ADB of any change in scope and alignment that would involve a change in the land acquisition and resettlement impacts or any emerging issues during construction, and propose necessary corrective actions for ADB's review.

58. **Indigenous peoples.** The project is screened as category C project for indigenous peoples planning requirements under the Safeguard Policy Statement. If during design review or implementation, any change to the scope or location, with prior approval of ADB, causes to have any such impacts, PEDO shall take all steps required to ensure that the project complies with the applicable laws and regulations of Pakistan and the Safeguard Policy Statement.

59. **Prohibited investment activities.** Funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth in Appendix 5 of the Safeguard Policy Statement.

## VIII. GENDER AND SOCIAL DIMENSIONS

60. Based on the findings of the poverty, social and gender assessment carried out during project preparation, a community development program was developed with the following salient features: (i) preference to local communities during the construction phase for unskilled, semi-skilled and skilled work, (ii) livelihood skills training programs for local communities, and (iii) training programs for improving the coping capacity of the local communities to respond to climate change and man-made and natural disasters. An NGO will be hired to assist PEDO in developing and implementing the community development program. The TOR are in Appendix 5.

61. A detailed gender action plan (GAP, Appendix 6).<sup>13</sup> Key actions of the GAP are: (i) developing and implementing a gender-mainstreamed community mobilization strategy; (ii) ensuring women's participation in consultations at all project implementation stages; (iii) developing and implementing a skills development program for improving livelihood opportunities, with 50% women's participation; and (iv) training women and youth groups to be climate change leaders to create awareness and sensitize their communities on issues related to climate change and to build resilience against disasters caused by humans or triggered by natural hazards. A gender specialist will be hired in the PIU to assist in implementing and reporting on the GAP. S/he will be assisted by the PMC's gender and community mobilization expert (TOR are in Appendix 2).

## IX. CLIMATE CHANGE ADAPTATION AND MITIGATION

62. Based on the climate change assessment, the project's climate risk classification is high. The project area has high risks of landslide, flood, and change in rainfall pattern. The climate change adaptation and mitigation plans in Appendix 7 will be incorporated in the EPC contract. The PMC will train PEDO staff in climate change mitigation in operations. The community development program NGO will develop and implement awareness-raising programs on climate change and natural disasters.

## X. PERFORMANCE MONITORING, EVALUATION, REPORTING AND COMMUNICATION

### A. Project Design and Monitoring Framework

**Table 12: Design and Monitoring Framework**

<b>Impacts the Project is Aligned with</b> Carbon footprint reduced; and energy sector made more renewable, efficient, and reliable (Pakistan National Power Policy, 2013) <sup>a</sup>			
<b>Results Chain</b>	<b>Performance Indicators</b>	<b>Data Sources and Reporting Mechanisms</b>	<b>Risks and Critical Assumptions</b>
<b>Outcome</b> Energy security in Khyber	By 2027: a. Installed hydropower share in the energy mix increased by	a.–b. NEPRA's annual state of industry reports	R: Delay in evacuation of power

<sup>13</sup> The GAP is also a linked document to the Report and Recommendation of the President.

Results Chain	Performance Indicators	Data Sources and Reporting Mechanisms	Risks and Critical Assumptions
Pakhtunkhwa enhanced	1200 MW (2020 baseline: 5,729 MW) (RFI A) <sup>b</sup> (OP 1.3; OP 1.3.1; OP 3.1.3)  b. Average daily load shedding in PESCO reduced to 2.0 hours daily (2020 baseline: 3.2 hours) (OP 1.3; OP 1.3.1)		will cause cash flow constraints.
<b>Outputs</b> 1. Climate-resilient hydropower plant commissioned	1a. By 2027, 300 MW hydropower plant commissioned in Balakot, Khyber Pakhtunkhwa, incorporating seismic strengthening and climate-proofing measures (2020 baseline: not applicable) (OP 1.3; OP 1.3.1; OP 3.1.1)  1b. By 2025, gender-inclusive community development program <sup>c</sup> implemented (2020 baseline: not applicable) (OP 2.1.4)	1a. Operational acceptance certificate  1b. PEDO's biannual project progress report	R: Contractors are not interested in bidding because of risks associated with land acquisition, resettlement, and site complexity.  R: Security issues in Khyber Pakhtunkhwa may affect the willingness of suppliers and providers to supply needed technologies.
2. Capacity for climate change risk management in hydropower production enhanced	2a. By 2023, knowledge of at least 30 PEDO staff (including at least 50% of PEDO's female staff) on climate change impact mitigation and adaptation for hydropower projects enhanced through training and capacity building (2020 baseline: 0) (OP 2.1.4; OP 3.1.2)  2b. By 2023, climate change risk guidelines in PEDO standard operating procedures for hydropower projects incorporated (2020 baseline: not applicable) (OP 3.1.2)  2c. By 2023, awareness campaign <sup>d</sup> in Khyber Pakhtunkhwa, with at least 30% participation by women and girls, on climate change impact and mitigation measures launched (2020 baseline: not applicable) (OP 2.1.4; OP 3.1.2; OP 6.1.1)	2a.–c. PEDO's biannual project progress report	

Results Chain	Performance Indicators	Data Sources and Reporting Mechanisms	Risks and Critical Assumptions
3. PEDO's revenues from indigenous resources increased	3a. By 2027, power purchase agreement for the 300 MW hydropower plant between PEDO and CPPA-G signed (2020 baseline: not applicable) (OP 6.1)  3b. By 2027, 300 MW hydropower plant connected to national grid (2019 baseline: not applicable) (OP 1.3; OP 1.3.1)	3a. Power purchase agreement  3b. PEDO's biannual project progress report	3. PEDO's revenues from indigenous resources increased
4. Income-earning opportunities and skills for local communities increased	4a. By 2023, 500 local jobs in construction-related work generated (2020 baseline: 0) (OP 5.1)  4b. By 2025, livelihood skills <sup>e</sup> of 500 community members, of whom at least 50% are women, improved (2020 baseline: not applicable) (OP 2.1.4; OP 5.1)	4a.–b. PEDO's biannual project progress report	

### Key Activities with Milestones

#### 1. Climate-resilient hydropower plant commissioned

- 1.1 Issue invitation for bids for a turnkey EPC contract for the 300 MW hydropower plant (Q4 2019)
- 1.2 Award EPC contract (Q1 2021)
- 1.3 NGO develops and starts community development program (Q2 2023)
- 1.4 Complete detailed design (Q1 2024)
- 1.5 Complete civil works (Q1 2026)
- 1.6 Erect transmission line (Q4 2026)
- 1.7 Test and commission hydropower plant (Q2 2027)
- 1.8 Issue request for proposals for the PMC (Q4 2019)
- 1.9 Award PMC contract (Q3 2020)

#### 2. Capacity for climate change risk management in hydropower production enhanced

- 2.1 PMC conducts capacity and specific needs assessment on climate change impact mitigation and adaptation for PEDO staff (Q3 2021)
- 2.2 Prepare training plan (Q4 2021)
- 2.3 Train PEDO staff (Q2 2022)
- 2.4 NGO develops and implements awareness-raising programs on climate change and disasters triggered by natural hazards (Q4 2023)

#### 3. PEDO's revenues from indigenous resources increased

- 3.1 EPD endorses draft power purchase agreement (Q3 2026)
- 3.2 PEDO and CPPA-G sign power purchase agreement (Q4 2026)

#### 4. Income-earning opportunities and skills for local communities increased

- 4.1 NGO develops and implements a gender-responsive community mobilization strategy for communities (Q3 2022)
- 4.2 Develop and implement livelihood improvement program (Q2 2023)
- 4.3 Train PEDO in developing socially inclusive and gender-responsive energy projects (Q1 2025)

**Project Management Activities**

Fully establish a project implementation unit in PEDO (Q2 2021)  
 Issue a request for proposals for the PMC (Q4 2019)  
 Award contract for the PMC (Q3 2020)  
 Recruit external environmental and resettlement monitors (Q4 2021)  
 Recruit a community developer NGO (Q1 2022)  
 Start implementing environmental management, land acquisition and resettlement, gender action, and climate change adaptation and mitigation plans (Q2 2021)

**Inputs**

Asian Development Bank: \$300 million (regular ordinary capital resources loan)  
 Asian Infrastructure Investment Bank: \$280 million  
 Government: \$175 million

CPPA-G = Central Power Purchasing Agency Guarantee Limited; EPC = engineering, procurement, and construction; EPD = Energy and Power Department, Government of Khyber Pakhtunkhwa; MW = megawatt; NEPRA = National Electric Power Regulatory Authority; NGO = nongovernment organization; OP = operational priority; PEDO = Pakhtunkhwa Energy Development Organization; PESCO = Peshawar Electric Supply Company; PMC = project management consultant; Q = quarter; R = risk.

<sup>a</sup> Government of Pakistan. 2013. [National Power Policy 2013](#). Islamabad.

<sup>b</sup> RFI A - Installed generation capacity. Target: megawatts, out of which hydropower has 6,029 megawatts

<sup>c</sup> The gender-inclusive community development program will ensure equitable participation of women during project implementation in all activities as indicated in the Gender Action Plan (accessible from the list of linked documents in Appendix 2).

<sup>d</sup> To be developed and implemented by a NGO under the community development program targeting men and women in the surrounding areas of the project. The target of 30% for women and girls is based on the gender assessment data of Khyber Pakhtunkhwa.

<sup>e</sup> Trainings to improve livelihood skills development is part of the overall community development program as indicated in the Gender Action Plan.

**Contribution to Strategy 2030 Operational Priorities**

Expected values and methodological details for all OP indicators to which this operation will contribute results are detailed in Contribution to Strategy 2030 Operational Priorities (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).

Source: Asian Development Bank.

**B. Monitoring**

63. **Project performance monitoring.** PEDO, with the PIU, will review overall project performance against the project outcome and output indicators in the design and monitoring framework, safeguards compliance requirements, and GAP, as well as financial and physical progress (including LARP updating and implementation, contract awards and disbursements). PEDO will submit quarterly progress reports to EPD, Planning Commission, EAD, Monitoring and Evaluation unit Planning and Development Department of Khyber Pakhtunkhwa and ADB by 20 April, 20 July, 20 October, and 20 January every year during project implementation.

64. **Covenant compliance monitoring.** Loan covenants—policy, financial, economic, environmental, and others—will be monitored through the semi-annual progress reports due by 20 July and 20 January every year, and ADB review missions.

65. **Safeguards monitoring.** The PIU, with the PMC's support, will ensure that the EMP is implemented. They will submit semi-annual environmental monitoring reports to ADB within 1 month of the reporting period during construction. Likewise, the PMU will submit semi-annual social safeguards monitoring report including the progress of updating of the LARP to commence 6 months after loan effectivity date. PMU will also submit the external resettlement monitoring reports to ADB prior to hand-over of sites to contractors. PMU and ADB will coordinate closely on addressing safeguards issues and recommendations that may arise during implementation. All reports will be disclosed in ADB and PEDO's websites.



66. **Gender and social dimensions monitoring.** The progress in GAP implementation will be included in the quarterly progress reports with the PMC's support. A social and gender Specialist at the PIU level will report on progress against the GAP indicators, monitor interventions carried out under the community development program, and document the social and gender good practices and impacts.

### C. Evaluation

67. **Inception mission.** ADB will field an inception mission before loan effectiveness to mainly (i) re-establish the working relationship among ADB, EPD and PEDO; (ii) reconfirm the project implementation schedule, and contract award and disbursement projections (Sections II and IV); and (iii) finalize the detailed disbursement arrangements.

68. **Review missions.** ADB will field semi-annual review missions to check overall project implementation, including the progress against the project outcome and outputs, covenant compliance, safeguards, gender and social dimensions, and utilization of both ADB and government counterpart funds. The project implementation schedule will also be updated as necessary.

69. **Midterm review mission.** ADB will field a midterm review mission within 3 years after loan effectiveness to primarily assess whether the project outcome is still likely to be achieved, as well as the contract award and disbursement projections.

70. **Project completion review mission.** ADB, with the borrower, EPD and PEDO, will field a PCR mission to primarily evaluate whether the project outcome was achieved, and assess the performance of all parties. EPD will submit its PCR to ADB and AIIB within six months of project completion. ADB will also prepare and disclose its own PCR.

### D. Reporting

71. PEDO will provide ADB, AIIB and EPD with the (i) quarterly progress reports in a format consistent with ADB's project performance reporting system; (ii) consolidated annual progress reports (in lieu of the quarterly progress report) due by 20 January every year including (a) progress achieved by output as measured through the indicator's performance targets, (b) key implementation issues and solutions, (c) updated procurement plan, and (d) updated implementation plan for the next 12 months; (iii) semi-annual progress reports, including compliance with loan covenants, financial management action plan implementation, and safeguard monitoring reports; and (iv) PCR. To ensure that the project will continue to be both viable and sustainable, project accounts and APFS together with the associated auditor's report, should be adequately reviewed.

### E. Stakeholder Communication Strategy

72. Following ADB's *Public Communications Policy* (2011),<sup>14</sup> ADB and AIIB will disclose on its website the safeguards and gender monitoring reports on implementation of the EMP, GAP, and resettlement plan; APFS; and procurement information (e.g. invitations for bids, contract awards, and procurement plan updates) immediately after they are made available. PEDO will also disclose the same on their website, as well as the quarterly progress reports.

<sup>14</sup> ADB. 2011. [Public Communications Policy 2011](#). Manila.

## **XI. ANTICORRUPTION POLICY**

73. ADB reserves the right to investigate, directly or through its agents, any violations of the Anticorruption Policy relating to the project.<sup>15</sup> All contracts financed by ADB shall include provisions specifying the right of ADB to audit and examine the records and accounts of the executing agency and all project contractors, suppliers, consultants, and other service providers. Individuals and/or entities on ADB's anticorruption debarment list are ineligible to participate in ADB-financed activity and may not be awarded any contracts under the project.<sup>16</sup> To support these efforts, relevant provisions are included in the loan agreements and bidding documents for the project.

74. EPD and PEDO will also apply their existing systems, controls and procedures for reporting fraud, corruption, and waste and misuse of resources to the project. For this, EPD and PEDO's internal audit units are expected to play a major role, and all employees within and outside of the project are expected to be whistle blowers. ADB's resolutions in the *Pakistan: Country Partnership Strategy (2015–2019)* related to using country systems and managing governance risks will also apply to the project.<sup>17</sup>

## **XII. ACCOUNTABILITY MECHANISM**

75. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make an effort in good faith to solve their problems by working with ADB's Central and West Asia Department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.<sup>18</sup>

## **XIII. RECORD OF CHANGES TO THE PROJECT ADMINISTRATION MANUAL**

76. All revisions and/or updates during the course of implementation should be retained in this section to provide a chronological history of changes to the implementation arrangements recorded in the Project Administration Manual, including revision to contract award and disbursement projections.

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<sup>15</sup> ADB. 1998. [Anticorruption Policy](#). Manila.

<sup>16</sup> ADB. [Office of Anticorruption and Integrity](#).

<sup>17</sup> ADB. 2015. [Pakistan: Country Partnership Strategy \(2015–2019\)](#). Manila.

<sup>18</sup> ADB. [Accountability Mechanism](#).

## DETAILED PROCUREMENT AND IMPLEMENTATION SCHEDULE

																								closing		31-Dec-27	
Package	Description	PCSS	Procurement/Selection Method	Bidding Procedure/Quality-Cost Ratio/Proposal Type	Contract Period (months)	Preparation and Advertisement					Bidding and Bid Evaluation							Signing and Effectiveness			Implementation						
						ADB Receives Draft BD	ADB Comments on Draft BD	ADB Receives Final Draft BD/ Submission 1	ADB Approves Final BD/ Submission 1	Invitation for Bids-BD issued/RFP	Technical bid/proposal opening	PEDO submits TBEP/ Submission 2 to ADB	ADB no objection to TBEP/ Submission 2	Price bid/proposal opening	EA submits FBEP/ Submission 3 to ADB	ADB no objection to FBEP/ Submission 3	Notice of Award/ Standstill period	ADB Receives Signed Contract and issues PCSS	Disbursement of 15% advance/Contract effectiveness/ Notice to Proceed	Basic Design	Detailed Design and Equipment Production	Civil Works	Erection of Transmission Line	Testing and Commissioning			
						CSRN	EOIs Due	Submission 1		Submission 2		Submission 3															
							10	10	4	8	60	45	21	7	7	14	10										
1	Design, supply, installation, testing and commissioning of 500-MW Balakot hydropower plant, including related civil works from river diversion up to transmission point	OCB-INT	IS2E	75	24-Oct-19				7-Nov-19	22-Nov-19	15-Jun-20	23-Nov-20	14-Dec-20	15-Dec-21	29-Dec-21	22-Jan-21	01-Feb-21	11-Feb-21	18-Feb-21	04-Mar-21	4-Mar-22	2-Dec-23	1-Dec-25	1-Sep-26	2-Jun-27		
	Consulting Services - firms					30	14	14	7	45	17	15	7	15	10	15	14	7	22						2,555		
2	Project management consultant	QCBS-INT	90:10, FTP	84	28-Jun-19	29-Jul-19	19-Sep-19	27-Sep-19	8-Oct-19	27-Nov-19	24-Jan-20	24-Apr-20	19-May-20	16-Jun-20	01-Jul-20	16-Jul-20	03-Sep-20	20-Nov-20	13-Sep-20						08-Aug-27		
3	Community development program NGO	QBS-NAT	STP	36	4-Mar-22	3-Apr-22	17-Apr-22	1-May-22	8-May-22	7-Jun-22	24-Jun-22	09-Jul-22	16-Jul-22	31-Jul-22	15-Aug-22	30-Aug-22	13-Sep-22	20-Sep-22	05-Oct-22						12-Sep-25		
	Consulting Services - individuals					7	30	10								7	7	7	15								
4	External environment monitor	NAT		6	4-Mar-22	11-Mar-22	10-Apr-22	20-Apr-22								27-Apr-22	11-May-22	18-May-22	02-Jun-22						02-Jun-27		
5	External resettlement monitor	NAT		9	4-Mar-22	11-Mar-22	10-Apr-22	20-Apr-22								27-Apr-22	11-May-22	18-May-22	02-Jun-22						02-Jun-27		

## TERMS OF REFERENCE OF PROJECT MANAGEMENT CONSULTANT International Consulting Firm

### A. Background

1. **Project description.** The proposed PAK Hydropower Development Project aims to develop a 300 MW run-of-river hydropower scheme on the Kunhar River in Kaghan Valley, between Balakot and Kaghan, Manshera District of Khyber Pakhtunkhwa, Pakistan, herewith mention as Balakot hydropower project (BHPP). The Executing Agency of the project is Pakhtunkhwa Energy Development Organization (PEDO) herein and after referred to as client. A feasibility was conducted in 2013 and later update in 2019 and referred as the Feasibility Study in paras below.

2. Balakot hydropower scheme consisting of 3 Generating Units of 100 MW has the following main components:

- (i) 58 meter (m) high gravity concrete dam above foundation. The dam structure is a concrete gravity, with a curved axis in plane and a radius of 187 m. The dam crest elevation is 1292.00 meters above sea level (masl) and the crest length is approximately 130 m. A crest width of 8.5 m is proposed to ensure adequate access for vehicles, cranes and other maintenance equipment. The dam will create a 2.2 kilometer (km) long reservoir, with a gross storage of 3.6 million m<sup>3</sup> at the normal operation level (NOL) 1288.00 masl. The hydro-mechanical equipment mainly encompasses the racks, gates and stop logs.
- (ii) 650 m long sediment by-pass/diversion tunnel,
- (iii) 9.1 km long concrete lined headrace tunnel with 8 m internal diameter,
- (iv) 122 m high surge shaft with 14.5 m inner diameter,
- (v) 5.6 m diameter steel lined pressure shaft and penstock,
- (vi) Cavern power house for 3 Francis groups with 300 MW installed capacity (for a 218 m net head and 154 m<sup>3</sup>/s turbine flow), two will be connected to 500 kilovolts (kV) grid and one unit will be connected to 132 kV grid to supply the local grid of the Balakot area.
- (vii) The proposed underground powerhouse is composed of two conventional cavern structures for three identical Francis units with vertical axis and for the power transformers and Geographic Information System equipment. The turbine axis is defined at elevation 1054.00 m, according to the estimated requirements to prevent cavitation of the turbines. The anticipated dimensions of the powerhouse main cavern (machine hall) are as follows: 20 m width, 71 m length and 34 m height. The single-phase transformers are arranged in a smaller cavern next to the main powerhouse cavern. The transformers cavern is approximately 14 m wide, 20 m high and 88 m long. The caverns' cover depth is circa 230 m.
- (viii) 244 m high downstream surge shaft with 3 m internal diameter,
- (ix) 1.6 km long tailrace tunnel.

3. The estimate for the project investment is around US \$700 million. The salient features of the Balakot HPP in accordance with Feasibility Study are summarized below.

1. Hydrology and Design Flows	
River	Kunhar
Catchment area at dam site (km <sup>2</sup> )	1939
Modular flow at the intake (m <sup>3</sup> /s)	87

Design Discharge (m <sup>3</sup> /s)	154
Design Flood (m <sup>3</sup> /s) T= 10,000 years	3500
Probable Maximum Flood (m <sup>3</sup> /s)	5000
<b>2. Reservoir</b>	
Normal Operation Level (NOL)	1288.0
Minimum Operation Level (MinOL)	1283.0
Surface area (at MOL) (km <sup>2</sup> )	0.28
Length of Reservoir (at NOL) (km)	2.2
Gross storage capacity (at NOL) (x106 m <sup>3</sup> )	3.56
Live storage (at NOL) (x106 m <sup>3</sup> )	1.20
<b>3. Dam Structure</b>	
Type	Concrete Gravity Arch
Dam crest elevation (masl)	1292.0
Maximum height above riverbed (m)	35.0
Maximum height above foundation (m)	58.0
Crest length (m)	130.0
<b>4. Spillways and low level outlets / flushing sluices</b>	
Spillway type	Upper gated ogee crest spillway + low level gated spillway
Upper spillway crest elevation (masl)	1278.0
Upper spillway gates no. and type	3 (radial gates)
Upper spillway gates size (W x H) (m)	11 x 10
Low level spillway invert elevation (masl)	1258.0
Low level spillway gates no. and type	2 (sluice gates)
Low level spillway size (W x H) (m)	6 x 8
<b>5. Sediment Management</b>	
Solution	Sediment Bypass Tunnel (SBT) + flushing outlets
SBT type	Gated intake followed by archway tunnel
Intake size (W x H) (m)	7.5 x 4.5
Inlet invert elevation (masl)	1261.0
Tunnel cross section (W x H) (m)	archway (7.5 x 8.0 )
Tunnel length (m)	650
Tunnel slope (%)	1.5
Outlet invert elevation (masl)	1248.0
Submerged guiding structure crest elevation(masl)	1272.0
Submerged weir/guiding structure height (m)	21 (estimated maximum above foundation)
<b>6. River Diversion</b>	
Construction Flood (T= 20 years) (m3/s)	900
Diversion type	openings left in the dam body for the low level spillway and a left bank diversion tunnel (which will be further converted to the sediment by-pass tunnel)
Upstream Cofferdam type	concrete gravity solution (which will be further converted to guiding structure)
Upstream Cofferdam crest elevation (masl)	1272.0
Downstream Cofferdam type	concrete gravity solution
Downstream Cofferdam crest elevation (masl)	1252.5

Diversion tunnel type	Archway (concrete lined)
Diversion tunnel no. (-)	1
Diversion tunnel size (W x H) (m)	archway (7.5 x 8.0 )
Diversion tunnel length (m)	650
Diversion tunnel slope (%)	1.5
Diversion tunnel inlet invert El. (masl)	1261.0
Diversion tunnel outlet invert El. (masl)	1248.0
<b>7. Power intake structure</b>	
Intake type	Horizontal intake
Trash rack no.	4
Trash rack size (W x H) (m)	8 x 10
Service gates no.	2
Service gates size (W x H)	4 x 8 m
Intake crest elevation (masl).	1271.0
<b>8. Headrace tunnel</b>	
Tunnel section	Circular concrete lined (8.0 m inner diameter)
Length up to surge tank (m)	9137
Tunnel slope (%)	0.56%
<b>9. Upstream surge shaft</b>	
Type	concrete lined circular surge shaft
Internal diameter (m)	14.5
Surge shaft height (m)	122
Surge shaft bottom elevation (masl)	1220.0
<b>10. Pressure tunnel/shaft and penstock</b>	
Pressure tunnel/shaft main section type and size	Steel lined circular cross section (5.6 m internal diameter)
Pressure tunnel/shaft length (m)	152
Penstock length (m)	88
Branch Section Type	Manifold (3 branches)
Size of each branch (m)	3.2 m internal diameter conduits
Max. Length of branch (m)	~30
Pressure tunnel/shaft main section type and size	Steel lined circular cross section (5.6 m internal diameter)
<b>11. Powerhouse and substation</b>	
Powerhouse type	conventional underground cavern
Main cavern general dimensions (LxWxH) (m)	71 x 20 x 34
Turbine type	Francis
No. of units	3
Turbine axis elevation (masl)	1054.0
No. of generators	3
Transformer / Substation type	Underground cavern (adjacent to the mainpowerhouse cavern)
Transformer cavern general dimensions(LxWxH) (m)	88 x 14 x 20
<b>12. Downstream surge shaft</b>	
Type	concrete lined circular surge shaft
Internal diameter (m)	3.0
Surge shaft height (m)	244

Surge shaft bottom elevation (masl)	1055.0
<b>13. Tailrace</b>	
Type	Circular tunnel with transition to an archway section at the final length and Outlet portal
Tunnel section	Circular concrete lined (8.0 m diameter)
Length up to the final transition section (m)	1515
Tunnel slope up to the final transition section (%)	0.23% (ascending slope)
Tunnel final section	Archway concrete lined section (8.0 W x 8.0 H)
Length from transition to outlet (m)	50
Tunnel slope up to the outlet portal (%)	15% (ascending slope)
<b>14. Power and Energy</b>	
Gross Head (m)	229.0
Design Net Head (m)	217.6
Installed plant capacity (MW)	300 (at the generator)
Mean annual energy (GWh)	1143 (average of 55 years)
<b>15. Project access facilities</b>	
Access road to dam and related structures (length)	550 m (from Sharan Road, connection to National Highway N-15 at the left side of Kunhar River, nearby Paras village)
Access road to sediment by-pass tunnel (length)	440 m (from dam bridge deck up to sediment by-pass tunnel intake)

4. **Firm Qualifications of the PMC.** The Project Management Consultant (PMC) must have capability in the design of storage hydropower plants and in the project/contract management and construction supervision. The PMC will provide technical, managerial and contractual support to PEDO during the entire cycle of the project, from the bidding phase through construction up to commissioning and first year of operation. Moreover, PMC will be responsible to review and approve the design, and monitor the construction process including IPC certification for PEDO.

5. The PMC should be an engineering consultancy firm having adequate international experience in detailed design, selection, monitoring, supervisions and co-ordination of contractor(s), operation and maintenance of at least one hydropower project comparable to BHPP i.e., minimum of 300 MW. Specific experience in the areas of:

- (i) Hydropower development with storage reservoirs;
- (ii) Inflow forecasting and operational scheduling of cascade (upstream, downstream) hydropower plants;
- (iii) Design of concrete dams and appurtenant structures, tunnels, underground powerhouse, transmission line and related electromechanical components;
- (iv) Geological experience with landslides;
- (v) Effective sediment management;
- (vi) Operation and maintenance of hydropower plants,
- (vii) Implementation of social and environmental safeguards for hydropower projects in accordance with internationally accepted guidelines and practices (such as those of ADB, and other international financial institutions);
- (viii) Procurement and EPC contract management for hydropower plants of nature comparable to BHPP i.e. minimum of 300 MW;

- (ix) Construction supervision of hydropower plants, dams and underground construction (tunnel, underground powerhouse) and transmission line.
- (x) Training and skill transfer programs for staff recruited locally in hydropower projects outside the bidder's country will be advantageous.

## **B. Duration and Location of the Assignment**

6. The PMC will be appointed for a forecast period of 7 years or closure of ADB Loan (whichever happens first), including pre-construction procurement phase and the construction phase. The commencement date shall be the date of which the contract comes into force, followed in due course by the kick-off workshop of all parties involved. The assignment will terminate with the Final Acceptance Certificate (FAC) and submission of the Project Completion Report to ensure proper coverage of the defects liability period. The construction period is expected to last 5 years. However, this might be subject to change depending on the implementation schedule of the selected EPC contractors.

7. Pre-construction period office location will be in Peshawar. Construction and defects liability period office location will be on-site.

## **C. Detailed Scope of Work**

### **1. Phase A–Procurement (Pre-construction phase)**

8. The PMC will provide supervision/monitoring of the project execution works and work schedule/planning of the project execution as “Project Manager/Engineer” on behalf of PEDO as per norms for an EPC contractor.

9. Phase A covers the services required in the procurement of EPC contractors to implement the BHPP. This Phase will cover the initial stage of the project. Phase A of PMC work will commence as soon as the letter of award is issued by PEDO and ends when the EPC contractor is mobilized to site. During Phase A, the PMC shall assist PEDO in the bidding process. Following the release of the terms of reference (TOR) for the EPC contract, the PMC will:

- (i) Review the bidding document.
- (ii) Ensuring that the EPC contractor bidding process abides the terms and guidelines of the ADB;
- (iii) The bidding process followed is international tender process (single stage 2 envelopes procedure of ADB's Plant, design, supply, installation and commission bidding document);
- (iv) Review and respond to queries / requests for clarifications raised during the bidding process;
- (v) To make amendments to the bid document in light of contractors queries.
- (vi) Employer shall approve and issue the amendment to the Tender bid documents.
- (vii) Conducting the evaluation process of the EPC Contractor, assessment of the technical and financial proposals from the bidders. And submit evaluation reports to client.
- (viii) To review designs, evaluate cost proposals financing arrangements and condition of repayment and to prepare report for PEDO giving recommended Tenderers.
- (ix) To fully familiarize itself with available documents of Balakot HPP i.e. (Land Acquisition Resettlement Plan (LARP), Environmental and Social Impact Assessment (ESIA), Feasibility Study (FS) etc.).



- (x) To process the ESIA report for No Objection Certificate (NOC) from Environmental Protection Agency Khyber Pakhtunkhwa with assistance of PEDO.
- (xi) To facilitate the Public Hearing Process (PHP) in the project area as per EPA, Khyber Pakhtunkhwa requirements with assistance from ESIA report developers and Client/PEDO.
- (xii) To demarcate and quantify the land and affected structures in the project area.
- (xiii) To review power purchase agreement and prepare the power tariff document/model and to provide assistance to PEDO in negotiations of power tariff with WAPDA/power purchaser.
- (xiv) To determine micro location of all the project structure.
- (xv) Survey and preparation of electrification plan in the valley from existing supply point, if required, including preparation of Bill of Quantities (BoQ), tender document and work supervision.
- (xvi) To assist and draw proposals/plan for training of PEDO staff for design, construction, operation and maintenance of Hydro Power plant.
- (xvii) To fully familiarize himself with available documents of Balakot HPP resettlement plan.
- (xviii) Obtain NOC from PESCO and NTDC for interconnection of the project with National Grid.
- (xix) Review the available data of hydrology, geological/geotechnical investigations and seismic tectonic studies.

10. The PMC will support PEDO in the negotiation process with the lowest evaluated responsive bidder by being responsible of:

- (i) Participation in the award process and negotiations;
- (ii) Recommendation and assistance in contract finalization; and
- (iii) Conduct financial negotiations with the successful EPC bidder with the consent of client.

11. Expected deliverables are:

- (i) Preparation of responses to clarifications received during the bidding process
- (ii) Preparing pre-bid meeting minutes
- (iii) Attending bid opening and preparing bid opening record
- (iv) Evaluation Report of technical proposals;
- (v) Evaluation Report of financial proposals;
- (vi) Summary of Evaluations and Recommendations for Award;
- (vii) Drafting of EPC contract agreement; and
- (viii) Documentation of contractual negotiations.

### **1.1.1 Review of existing design and studies**

12. Before commencing the front-end design services, the existing data and documents have to be thoroughly reviewed and analyzed. The activities to be undertaken by the PMC shall include but will not be limited to:

- (a) Review and be familiar with the final updated and approved version of the feasibility report prepared by AQUALOGUS, TEAM, ZEERUK, supplemental environmental and social assessments, and all other relevant reports or background reports and data. Review and be familiar with reports on additional geotechnical, hydrological and topographical studies.
- (b) Review and be familiar with all approval certificates/documents and statutory requirements required for the commencement of construction activities.
- (c) Check the proposed access road options and quarries.
- (d) General check on assumptions and design features.

- (e) Identification of weak points, missing or insufficient data.
- (f) Identification and scope of additional studies and investigations, if required.
- (g) Develop a Communication Management Strategy that describes the means and frequency of communication with parties both internal and external to the project.
- (h) Approval of switchyard/interconnection equipment from NTDC and CPPA-G.

### **1.1.2 Risk assessment**

13. The PMC shall Conduct a risk analyses and advise PEDO on potential risks during the design, construction, commissioning and operational phases of the project. The PMC shall develop a Risk Management Strategy that describes the specific risk management techniques and standards to be applied, and the responsibilities for achieving an effective risk management procedure.

14. At the end of the process, the PMC shall prepare a report on strengths and weaknesses of the project with detailed suggestion and guidance to PEDO, of optimization and sustainability for the next project phases. The PMC has to take into account a worst-case scenario for different risks and show the impact and how to deal with it, reduce or eliminate it.

## **2. Phase B – Design review and Construction Supervision**

15. Phase B will cover the construction phase, which is supposed to last 5 years. The PMC shall act as The Engineer on taking over responsibility for all engineering/design review, approval and construction supervision activities for the entire implementation phase. This Phase includes the tasks listed below.

### **a. Review of existing design and studies**

16. Before commencing the front-end design services, the existing data and documents have to be thoroughly reviewed and analyzed. The activities to be undertaken by the PM Consultant shall include but will not be limited to:

- (i) Review and be familiar with the final updated and approved version of the feasibility report prepared by AQUALOGUS, TEAM, ZEERUK, supplemental environmental and social assessments, and all other relevant reports or background reports and data. Review and be familiar with reports on additional geotechnical, hydrological and topographical studies.
- (ii) Review and be familiar with all approval certificates/documents and statutory requirements required for the commencement of construction activities.
- (iii) Check the proposed access road options and quarries.
- (iv) General check on assumptions and design features.
- (v) Identification of weak points, missing or insufficient data.
- (vi) Identification and scope of additional studies and investigations, if required.
- (vii) Develop a Communication Management Strategy that describes the means and frequency of communication with parties both internal and external to the project.
- (viii) Approval of switchyard/interconnection equipment from NTDC and CPPA-G.

### **b. Risk assessment**

17. The PMC shall Conduct a risk analyses and advise PEDO on potential risks during the design, construction, commissioning, and operational phases of the project. The PMC shall develop a Risk Management Strategy that describes the specific risk management techniques

and standards to be applied, and the responsibilities for achieving an effective risk management procedure.

18. At the end of the process, the PMC shall prepare a report on strengths and weaknesses of the project with detailed suggestion and guidance to PEDO, of optimization and sustainability for the next project phases. The PMC has to take into account a worst-case scenario for different risks and show the impact and how to deal with it, reduce or eliminate it.

#### **c. Technical support and design review**

19. The PMC shall review and approve the detailed design of the project submitted by the contractor, and any further design modification. All aspects of the design will be covered, including:

- (i) Structural and geological/geotechnical design of the dam and appurtenant structures;
- (ii) Structural and geological/geotechnical design of the tunnel and underground powerhouse;
- (iii) Hydraulics of spillway and energy dissipation;
- (iv) Hydraulics of the tunnel;
- (v) Sediment management and physical hydraulic modelling of flushing through the tunnel;
- (vi) Access road and ancillary civil structures and infrastructures;
- (vii) Electrical equipment for the Main and Auxiliary Power Plants as per NTDC/CPPA/NPCC requirement;
- (viii) Mechanical and Hydraulic Steel Elements - Main and Auxiliary Power Houses and Spillway Gates;
- (ix) Balance of Plant and connection to the network - Main and Auxiliary Power Houses as per NTDC/CPPA/NPCC requirement.
- (x) Transmission line/ interconnection.
- (xi) Any additional design requirement.

20. The review shall include independent calculations and analysis for each of the aforementioned project components in order to verify the robustness and reliability of the design. Where appropriate the PMC shall advice PEDO about potential improvements to the designs. As a result of the review, the PMC shall require not only the design modifications in order to have a final design in accord with the international best practice and standards in the industry, but even integrative geotechnical investigations and additional physical/numerical studies whenever deemed necessary.

#### **d. Construction Supervision**

21. The PMC will provide supervision/monitoring of the project execution works and work schedule/planning of the project execution as "Engineer" on behalf of PEDO as per norms for an EPC contractor. More into the specific, the PMC tasks during construction will include:

- (i) Being responsible of the monitoring of compliance with approved design and outputs as per norm for an EPC contract will be part of the task;
- (ii) Define quality standards and measures, sustainable standards and milestones for EPC contractors;
- (iii) Provide Certificates of Milestone Completion;
- (iv) Prepare and follow up the cost control schedule;
- (v)

- (vi) Supervise site installations and erection, progress monitoring, quality control and testing requirements (workshop and site) as well as commissioning and project acceptance documents (PAC – Project Acceptance Certificate);
- (vii) Define reporting proposal (substance and frequency);
- (viii) Continuous project control and monitoring;
- (ix) Review claim submitted by contractor, its assessment and recommendation and defence;
- (x) Compliance with Pakistani and international site safety and environment standards and regulations;
- (xi) Prepare presentations / briefings on Environmental Management Plan (EMP) as and when required;
- (xii) Review, coordinate and, where appropriate, comment on all documents and reports submitted by EPC contractors;
- (xiii) Monitor the submission of documents against the Engineering Review Documents Schedule. Review in a timely manner the EPC Contractor's drawing, specifications, O&M manuals to ensure compliance with the EPC specification;
- (xiv) Provide timely notice to PEDO of events or trends, which could have potential negative impacts to the project and propose resolutions;
- (xv) Assure submission and advise on the adequacy of the contractor's insurance policies.
- (xvi) Review and approve the contractors work programs and progress schedules ensuring that the contractors have incorporated followed the most effective and expeditious methodology of carrying out the works; and advise the contractors in setting up a computerized project control system for reporting physical and financial progress as well as the forecasts, if included in the bids and/or if demanded later on by the PEDO and closely monitor the construction progress on regular basis to determine whether it is proceeding in accordance with the approved work program;
- (xvii) Provide advance advice to the PEDO concerning the Schedule of handing over sites, and possible delays due to lack of possession with a view to assure that the Contractors are given Possession of site in accordance with agreed works program;
- (xviii) Assess minimum construction equipment, plant and machinery requirements, by type and specification, and monitor, keep and regularly update a list of the Contractors' equipment, plant and machinery in order to keep a check on the Contractor Progress;
- (xix) Inspect and evaluate the Contractors' establishments including in particular the laboratory facilities to ensure compliance with the terms and conditions of the contracts Agreement;
- (xx) Assure the receipt of and maintain as permanent records of all warranties required under terms and conditions of the contract agreement for the materials including their source and equipment accepted and incorporated in the project;
- (xxi) Without relieving the Contractors of their obligations under the Contract, review and ensure compliance such that the works are carried out at all times in a safe and secure manner and damage or injury to persons or property is avoided;
- (xxii) Inspect quarries and borrow pits and crushing plants and other tests of materials ensure adherence to specifications, and approve the sources of materials;
- (xxiii) Without relieving the Contractors obligations under the Contract, monitor Contractors' laboratory testing, evaluate the Portland cement concrete designs prepared by the Contractors, and recommend improvements;
- (xxiv) Monitor and appraise progress of the works and maintain a day by day project diary and shall record all events pertaining to the administration of the contract concerning execution of works;
- (xxv) Maintain consolidated project accounts, and prepare financial statements withdrawal applications for submission to the ADB;

- (xxvi) Assist with interpretation of the Contract Documents, explain and or reconciled ambiguities and or discrepancies in the Contract Documents and apply various provision of the contract documents and provide PEDO all relevant documentation needed settling disputes (if any) with the Contractors, processing claims recommendations to PEDO for resolving the Contractor's escalation claims, contract extension, quantification of claims, rate and price fixing etc.;
- (xxvii) Advise PEDO on need for effective liaison with local authorities, police, landowners, owners, the public and other organizations affected by the works in order to minimize/ avoid unnecessary delays or disputes;
- (xxviii) Assist PEDO in settling any Audit Para's, Objections raised, prepare replies related to the project, and provide the entire relevant documents/papers/letters etc., to support the replies;
- (xxix) Establish a comprehensive system of maintaining site record including site correspondence, inspection records, site diaries, records of meetings, financial records, progress records etc.
- (xxx) Prepare movie up to international standard of all the activities occurred on the project, from date of starting to end of the project;
- (xxxi) Ensure construction of transmission line as per NTDC/PESCO requirements /specifications/design;
- (xxxii) Ensure construction of Switchyard as per NTDC/PESCO requirements /specifications/design;
- (xxxiii) Maintain the necessary presence until the site is cleared by the EPC Contractor.
- (xxxiv) Develop an effective working relationship with the EPC Contractor, ensuring clear and appropriate lines of communication are established and maintained throughout the on-site construction, commissioning, and testing phase of the project;
- (xxxv) Review, comment and monitor the EPC contractor's compliance with his own procedures, for example:
  - a. Construction management Plan
  - b. Environmental Management Plan
  - c. Monitor contractor to ensure compliance with design specifications and standards
- (xxxvi) Establish, update and monitor the following logs/registers throughout project implementation:
  - a. Project diary – to record informal issues, required actions or significant events not captured by the other registers or logs;
  - b. Issue register – to capture and maintain information on all issues that are being formally managed;
  - c. Quality Register –to summarize all the quality management activities that are planned or have taken place;
  - d. Risk Register – provides a record of identified risks relating to the project including their status and history. It shall be monthly discussed.
- (xxxvii) Review the available data of hydrology, geological/geotechnical investigations, and seismic tectonic studies and in case any further studies or up gradation of existing requires that should be clearly highlighted in their Technical and Financial proposals;
- (xxxviii) Demarcate and quantify the land and affected structures in the project area.

#### **e. Contract Management and financial monitoring**

22. While supervising the execution of physical works, the PMC shall assist PEDO in the certification of payment procedures, as well as contract management. The PMC will:

- (i) Examine invoices submitted by EPC Contractors on the basis of the supply and service contracts, to determine whether the services and supplies being invoiced were actually performed, and will be responsible for invoice certification;
- (ii) All variations and claims shall be subject to approval of the Employer;
- (iii) Be responsible to review and recommend any variation order to PEDO;
- (iv) Examine that the payment has fallen due and all necessary documents are available as required in the supply and service contracts;
- (v) Examine that the documents to be presented include valid down payment and implementation guarantees in accordance with the specimen required by ADB (validity, guarantee amount), if applicable, insurance policies and transport documents;
- (vi) Examine whether the regulations concerning the disbursement procedure that are agreed between the PEDO and ADB – and are passed on to the PMC – are being adhered to;
- (vii) Report regularly financial status of the project to PEDO by:
  - a. reporting the disbursement result and financial position and actual cash flow position;
  - b. performing detailed variation analysis between estimated/budgeted position against the actual position;
  - c. assessing future requirements and payment schedules;
  - d. Recommending possible measures for reducing expenditure, if any.
- (viii) Be vigilant and keep complete record of the project activities to avoid time extension, variations etc. However otherwise Investigate, inspect, assess and give recommendation for the extension of time, variation orders, payment for variation orders, as per contract.
- (ix) Keep the relevant documents ready for inspection by PEDO and ADB.

#### **f. Environmental and social monitoring**

23. The PMC shall monitor contractor's compliance with environmental and social safeguards requirements of the contract, including monitoring and updating of the Environmental and Social Mitigation Plan (ESMP) and Resettlement Action Plan (RAP). Moreover, the PMC shall assist PEDO in identifying and reporting adverse environmental impacts during the execution of the project and suggest modification to designs and practices to mitigate them. More specifically, the PMC has to cover the following issues:

- (i) Establish an environmental and social management system with project specific ESMP including contributions to a Catchment Management Plan, considering the provisions set in the Environmental and Social Impact Assessment reports and the conditions set by local legislation, as well as additional requirements of ADB;
- (ii) Update the environmental and social baselines. Baseline information will be required upstream of the reservoir and downstream of the tailrace and for the River ecosystem. This will require the review of existing documentation, including ESIA reports for the BHPP. Undertake field studies as necessary to fill identified gaps, and to confirm and update monitoring indicators. Indicators to be monitored should be well articulated with clear frequency and resources for monitoring;
- (iii) Assist PEDO in identifying and reporting adverse environmental impacts during execution of the project and suggest modification to designs and practices to mitigate them.

- (iv) Providing necessary information to the Resettlement Action Plan. The PM Consultant requires to support the update of the figures for land acquisition, types and numbers of project affected people etc., under consideration of the final project layout;
- (v) Ensure that management plans prepared by the contractors are compliant with the ESMP and oversee their implementation;
- (vi) Preparation of monthly reports on compliance on all environmental and social/community aspects including grievances (Environmental and Social Performance Reports, covering Environmental and Social Management as well as the implementation of construction contractor's ESMP);
- (vii) PMC environmental management staff shall be continuously involved in environmental and social impact management tasks in order to build up further capacity on environmental and social impact management and monitoring.

#### **g. Gender action plan monitoring**

24. The PMC shall support PEDO in the review of the project-specific Gender Action Plan (GAP) prepared by contractor. The PMC shall ensure that the GAP includes clear targets, quotas, design features and quantifiable performance indicators to ensure gender equality in participation to the project and related benefits. The PMC shall ensure that the following minimum contents are included in the GAP (for both construction and operational phase):

- (i) preparatory work undertaken to address gender issues in the project;
- (ii) quotas, targets, design features included in the project to address gender inclusion and facilitate women's involvement and/or ensure tangible benefits to women;
- (iii) mechanisms to ensure implementation of the gender design elements;
- (iv) Gender monitoring and evaluation indicators.

25. The PMC shall monitor that the procedures and measures included in the GAP are successfully implemented throughout the entire duration of the project.

#### **h. Training**

26. The PMC will provide training and capacity building to PEDO staff. Training will cover best practice for an effective operation and management of the plant. The training shall include the management of BHPP in cascade with Sukhi Kinari, sediment management, and mitigation of climate change through operation.

#### **i. Tariff study and Energy Purchase Agreement (EPA)**

27. Assistance to PEDO for preparing the tariff shall be given both at the EPC stage and COD stage.

### **3. Phase C – Commissioning and monitoring**

28. Phase C will cover the post-construction phase, which is supposed to last 1 year. It includes commissioning up to Project Acceptance Certificate (PAC) and Commercial Operation Date (COD), and operation after COD up to Final Acceptance Certificate (FAC).

#### **a. Activities during commissioning up to PAC and COD**

29. The PMC shall advise on and, where necessary and appropriate, represent PEDO and coordinate and provide approvals in relation to activities associated with:

- (i) Review and approval of general test procedures developed by EPC contractors;
- (ii) Compliance with Pakistani and international site safety and environment standards of ADB (including performance standards of the International Finance Corporation-IFC);
- (iii) Test electromechanical plant and equipment (including Factory Acceptance Tests (FAT), factory inspection, raw material inspection);
- (iv) Commissioning of civil structures (if not executed in an earlier state), electromechanical plant and equipment including dry and wet testing as well as initial readings (forces, measurements, etc.) during the commissioning period;
- (v) Resolve all interconnection issues with NTDC/CPPA-G.
- (vi) Issue and review of critical spare parts list;
- (vii) Support on the job training by the EPC Contractors to the involved PEDO's professionals in all aspects of the project during implementation and commissioning;
- (viii) File and where necessary improving as-built drawings, documentation and O&M manuals;
- (ix) Issue final punch list for PAC;
- (x) Supervise the rectification of the major punch list items before issuing PAC;
- (xi) Supervise the trial run;
- (xii) Issue Project Acceptance Certificate (PAC);
- (xiii) For a quarterly Project Review Meeting during the entire implementation phase, the PM Consultant shall prepare and present a formal audio/visual presentation as well as a project review report. The final Project Review Meeting shall take place with the issuance of a COD Certificate;
- (xiv) Engineering interpretation of efficiency or index measurements, if carried out;
- (xv) Issue the Commercial Operation Date (COD) Certificate, the signature and issuance of which will designate the beginning of the two years warranty period/defects liability period;
- (xvi) Any other related activities.

#### **b. Activities during operation after COD up to FAC**

30. During the defects liability period, the PMC will advise on and, where necessary and appropriate, represent PEDO and coordinate and provide approvals and recommendations in relation to activities associated with:

- (i) Supervision of the rectification of all defects during the warranty period with issuing of clearances for defects rectified as well as a prolongation of warranty for major parts, if applicable;
- (ii) Overseeing compliance with contractual obligations;
- (iii) Issuing the Final Acceptance Certificate (FAC) after successful ending of the defects liability period.
- (iv) Preparation of the final accounts for the construction soon after issuance of the FAC;
- (v) Preparation of a project completion report, acceptance of which will signify the end of the PM Consultant's assignment on the consultancy contract;
- (vi) Organize contract closure activities and contract closure meeting;
- (vii) Any other related activities.

#### **c. Support for PEDO in Operation (Post Commissioning) of the Project**

31. **Plant operation planning in detail.** The PMC shall prepare operations and maintenance strategy documents including organization and staffing of operation, long-term and mid-term maintenance schedules, schedule and procedures of regular inspections, sediment flushing



schedule and procedures, training program for PEDO staff, recording system on a regular basis, accident reporting system, and submit them to PEDO for review and consent. The consultant shall also prepare operation and maintenance manuals of the plant for PEDO's staff, detailing schedule of each maintenance activity, and submit it to PEDO. The strategy documents and operation and maintenance manual shall be finalized not later than one month before the commissioning of the project.

**32. Operation and maintenance activities of the plant on regular basis.** Based on the operation and maintenance strategy documents and daily instructions by the PEDO's load dispatch centre, the PMC shall assist PEDO in operating the plant on the basis of three shifts. The PMC shall train operations staff through a training program as consented in the operation and maintenance strategy documents. The PMC shall gradually transfer their operation and maintenance activities to relevant staff in consultation with PEDO, so that the relevant staff can operate the plant by themselves after the consultancy contract of the PMC expires. The PMC shall prepare an annual maintenance plan with an estimated budget to optimize the cost of maintenance and to achieve long term reliability of operation of the systems and equipment. The maintenance plan shall include the maintenance activities, and the frequency of maintenance. For overhauling works, the PMC shall prepare the overhaul schedule with budget estimates in the long-term schedule. The PMC shall assist in conducting maintenance of the plant in accordance with the annual maintenance plan.

**33. Monitoring, controlling and reporting operational performance of the project.** The PMC shall prepare operating procedures to ensure effective operation of the plant and equipment. This should include activities for an effective condition monitoring program (for example, turbine runner non-destructive testing), a functional testing program, and routine preventative maintenance activities.

**34.** The PMC shall establish the document management system for reports on operation and maintenance activities. The PMC shall review the daily, weekly, monthly, quarterly and annual reports prepared by O&M team at the initial operation stage. The PMC shall establish monitoring and control system of operation and maintenance activities, based on the operation and maintenance strategy documents as agreed with PEDO. The PMC shall periodically review efficiency of the said systems and modify as and when required.

**35.** The PMC shall also prepare an effective Asset Management Plan for BHPP covering the electro-mechanical as well as hydro-mechanical plant. The information presented in this plan will be used by PEDO for their future planning of plant outages and budget requirements.

**36.** The PMC shall establish a quality assurance system in accordance with the consented operation and maintenance strategy documents. It is recommended that the PMC should apply for quality assurance system ISO 9001. PEDO and the PMC shall establish operating and control procedures for all departments/units/outside service providers, monitor performance of all activities concerned, conduct internal audits, correct or prevent non-conformities, and adopt continual improvement actions.

**37.** The PMC shall supervise all works pertaining to the operation of the Balakot HPP. The PMC shall supervise all works conducted based on the annual maintenance plan or overhaul schedule as well as ensure adherence to project scheduling.

**38. Project impact monitoring.** The PMC shall make proposals for appropriate indicators to measure the impact of the project on target groups to determine how far the project has

successfully contributed to the overall programme objectives. The general indicators that should be considered, but not limited to, are:

- (i) Annual energy output, split between off-peak and peak periods;
- (ii) Energy cost saving (compared with alternative fossil power plants);
- (iii) Reduction of pollutants and CO2 emissions (compared with the alternative with fossil power plants);
- (iv) Economic internal rate of return of the project;
- (v) Technical availability of the power plant;
- (vi) Complete fulfilment of relevant social and environmental safeguards.

39. For the purpose of future project evaluation, the PM Consultant shall establish a data base by conducting an appropriate baseline study for the above agreed indicators. The PM Consultant shall also develop a Benefits Review Plan used to define how and when a measurement of the achievement of the project's benefits can be made.

#### **d. PMC additional Inputs to the Project**

40. The PMC shall provide the following inputs in any of the three phases previously described.

- (i) Make all necessary arrangements to ensure the project proceeds on schedule.
- (ii) PMC will assist PEDO to appoint core project/asset management team
- (iii) During the implementation of the project, PMC shall provide coordination and liaison with all relevant stakeholders.
- (iv) PMC will produce, update and maintain for the duration of the services, all relevant reports, data, and documents pertinent to the proposed services and necessary for the requested services.
- (v) PMC will arrange the following facilities, services, equipment, materials, documents and information as required in both Main Office and at Balakot Construction Camp for carrying out the assignment:
- (vi) Office space: sufficient office space with national and international telephone lines, electricity and air conditioning/heating, and internet connections;
- (vii) Office furniture: desks, office chairs, adequate to accommodate the full complement of international and local consultants, and bookshelves/cabinets, etc;
- (viii) Organizational support: All arrangements for workshops, meetings, and field visits; and access to required data, maps and other relevant information.
- (ix) Co-ordination with other governmental and provincial agencies, authorities and offices for receiving their cooperation as necessary for the execution of the services.
- (x) Assistance in obtaining permits and authorization from government agencies for clearance through customs, obtaining entry and exit visas, residence permits, etc. as necessary for the execution of the services.

#### **D. Deliverables**

41. The PMC shall prepare and issue reports, documents, approvals and certificates covering the following:

- (i) Proposed indicators;
- (ii) Baseline Study Report and updates when required until COD;
- (iii) Benefit review plan and model;
- (iv) Monthly progress reports. They shall be issued one week after the end of each month, and shall cover:
- (v) the project activities undertaken;

- (vi) Disbursement schedule with a forecast;
- (vii) Quality management activities that have been undertaken;
- (viii) Issues and risks that have arisen, been dealt with and are still outstanding;
- (ix) Signed minutes of site progress meetings;
- (x) Approved monthly progress reports of the EPC contractors.
- (xi) Monthly review reports. All reports and documentations produced by the EPC contractor have to be reviewed and approved by the PMC, which will include the results of the review on dedicated monthly reports.
- (xii) A quarterly progress report, issued two weeks after the end of each quarter, covering the project activities undertaken, disbursement schedule with a forecast, quality management activities that have been undertaken, issues and risks that have arisen, been dealt with and are still outstanding. It shall include non-conformance report, and update about costs included/projected and estimated time to complete.
- (xiii) An annual progress report, issued one month after the end of each year, covering the project activities undertaken, disbursement schedule with a forecast, quality management activities that have been undertaken, issues and risks that have arisen, been dealt with and are still outstanding.
- (xiv) Special Technical Reports may be required on construction, quality issues, manufacture and installation due to unforeseen conditions or problems.
- (xv) Commissioning reports showing the extent of works involved, the criteria by which its performance is to be judged, the initial baseline force measurements, results obtained from the tests during commissioning, and a list of any minor defects or deficiencies to be rectified during the ensuing Defects Liability Period;
- (xvi) As-built and other documentation together with all the project logs/registers;
- (xvii) Project Completion Report together with the FAC which shall include, but not be limited to:
  - comprehensive description of the project as executed, indicating relevant modifications to the initial tender design;
  - compilation of all problems/issues met and risks that emerged during execution and the solutions implemented;
  - the final implementation schedule compared with initial planning;
  - schedule of major events of importance during the execution of the project;
  - summary of the overall project costs, structured according to the initial confidential cost estimate;
  - proposal for post-project review (who prepares it, when it should be done and who should be involved);
  - Summary of follow-on action and recommendations, if applicable.

42. Reports shall be submitted according to the following timetable.

<b>Reports</b>	<b>Deadline After Commencing Phase B</b>
Proposed indicators	1 month
Baseline Study Report	2 months
Benefits Review Plan/Model	3 months
Monthly progress report	One week after the end of each month
Monthly review report	One week after the end of each month
Quarterly progress report	One week after the end of the third month of the quarter
Annual progress report	One week after the end of each construction year
Special Technical Reports	When required

<b>Reports</b>	<b>Deadline After Commencing Phase B</b>
Commissioning Report	After commissioning but before PAC date
As-built and other documentation together with all the project logs/registers	2 months after COD
Project Completion Report	with FAC Date

43. Except for the monthly reports (which shall be submitted to PEDO by e-mail and in two hard copies), all the above reports shall be submitted to PEDO in two (2) hard copies and by e-mail to PEDO and ADB. PEDO shall review and comment on the submitted reports by email within two weeks from the date of receipt. The PMC shall be expected to incorporate these comments within two weeks. Finally, the documents have to be resubmitted in 2 hard copies and by email.

#### **E. Team Composition and Qualifications of Experts**

44. The selected PMC must ensure that a team of specialised and experienced engineers will be on site to supervise all relevant tasks of the construction and implementation. The head of the site team shall be the Deputy Team Leader (Resident Engineer) who shall be in the country and on site at all times from ground-breaking until the commissioning of the project is completed and the PAC is issued. A suitably qualified member of the PMC team shall serve as an on-site proxy when the Resident Engineer is off-site. The Deputy Team Leader will report to the Project Manager, which will regularly visit the construction site. The Balakot Hydroelectric Project is a large hydropower project in Khyber Pakhtunkhwa and the management of such a project will require specialized skills and relevant international experience. As such, the international and national experts will have to work in coordination with PEDO personnel for the successful execution of the project.

45. The following table gives an estimate of the international and national experts and person months required for the project. Each staff member is marked as Full Time (FT) or Part Time (PT). Full time staff will provide continuous inputs during the time allocated, while the part time staff will provide intermittent inputs.

	<b>Position (FT=Full time, PT=Part Time)</b>	<b>Person-Months</b>
	<b>International Experts</b>	
1	Project Manager – Team Leader (PT)	36
2	Procurement Expert (PT)	6
3	Contract Manager (PT)	9
4	Geotechnical Expert (PT)	24
5	Hydraulics expert (PT)	15
6	Sediment management expert (PT)	15
7	Hydro-mechanical Expert (PT)	15
8	Electrical Expert (PT)	15
	<b>Total International Experts</b>	<b>135</b>
	<b>National Experts</b>	
9	Resident Engineer – Deputy Team Leader (FT)	84
10	Chief Engineer (Dams & Surface Works) (FT)	72
11	Chief Engineer (Underground Works) (FT)	72
12	Chief Engineer (Electrical Works) (FT)	36
13	Chief Engineer (Mechanical works) (FT)	36
14	Electricity tariff and PPA expert (PT)	24
15	Civil Engineer (dam) (FT)	72

	<b>Position (FT=Full time, PT=Part Time)</b>	<b>Person-Months</b>
16	Civil Engineer (other surface works) (FT)	72
17	Quality Assurance Engineer (dam and surface works) (FT)	72
18	Civil Engineer (tunnel) (FT)	72
19	Civil Engineer (powerhouse) (FT)	72
20	Quality Assurance Engineer (underground works) (FT)	72
21	Hydro-Mechanical Engineer (FT)	36
22	Electrical Engineer (FT)	36
23	Transmission Line Engineer (PT)	6
24	Switchyard Engineer (PT)	10
25	Contract Specialist (PT)	30
26	Quality Assurance Engineer (E&M) (FT)	36
27	Health and Safety monitor (FT)	60
28	Resettlement Expert (PT)	30
20	Gender/community mobilization Expert (PT)	15
30	Environmental Expert (PT)	30
31	Document controller (monitoring)/Finance Expert (FT)	60
	<b>Total National Experts</b>	<b>1105</b>
	<b>Total International and National Experts</b>	<b>1240</b>
	<b>National Support Staff</b>	
32	Inspector (Dams & Surface Works) (FT)	180
33	Inspector (Underground Works) (FT)	300
34	Inspector (E&M Works) (FT)	360
35	Cost/time controller (FT)	84
36	Office support staff (engineers) (FT)	300
37	Office support staff (CAD) (FT)	300
	<b>Total National Support Staff</b>	<b>1524</b>

46. The above experts may continue to work during the operational phase, if required. In case the experts are not suitable in the transition from construction phase to operational phase, the firm will have to ensure that any replacement be a person of equivalent or better qualifications as the person being replaced.

47. The PMC team will consist of experts from several technical expertise for project management activities from construction to operation and maintenance stages. For key expert positions, in-house staff of the firm will be preferred. Each expert will perform his/her tasks in collaboration with their team members. The terms of references outlining the specific areas of responsibility/job description for each expert are given below. In addition, the experts are expected to perform any other reasonable duty that may not be mentioned in the job description but is expected to be performed in an assignment of this nature.

48. Support staff (accountants, administrative staff, drivers, runners and helpers) and office support staff (CAD operators, junior engineers) are not included in the list, and shall be quoted as a separate lump-sum as back office support.

### **1. International Experts**

49. The **Project Manager/Team Leader (TL)** will have a degree in Civil Engineering preferably with Project Management Degree, with at least 25 years of experience in dams and hydropower projects. He must have successfully completed at least 2 Hydropower projects of size

of at least 300 MW and complexity (Tunnels & Cavern Powerhouse) comparable to BHPP as Team Leader and/or Resident Engineer. The TL will have relevant work experience in developing countries, preferably in Asia. Experience in Pakistan would be an advantage.

50. S/he will be responsible for the management and coordination of the overall project implementation. He will report directly to PEDO, and will be responsible for the liaison with the main stakeholders. The TL will be on intermittent basis, and is expected to spend at least 35% of the allocated time on the project site.

51. The **Procurement Expert (PE)** will have a degree in engineering preferably with a Master's degree in Procurement/Contract Law/Contract Management or equivalent, with at least 20 years of experience in procurement activities of EPC contracts specially in evaluating bids. Relevant experience in developing countries, preferably in Asia will be an advantage. The expert must have knowledge and experience of working on ADB or other international financing institutions such World Bank (WB), European Bank for Reconstruction and Development (EBRD) as PE.

52. The PE will be a Part-time role and will spend a minimum 60% of the allocated time on the project site. The PE will mainly do the following:

- (i) Assist in the entire bid management process including bid clarifications, preparation of responses to bidders, revisions to bidding document if needed in response to clarifications, bid opening documentation and support, bid evaluation and negotiation of EPC contractor;
- (ii) Set up the procurement procedure for the project;
- (iii) Execute skills transfer programs for PEDO personnel during all stages of the project;
- (iv) Assist in maintaining sound external relations and personnel relations.

53. The **Contract Manager (CM)** will have a degree in engineering preferably with a Master's degree in Procurement/Contract Law/Contract Management or equivalent, with at least 20 years of experience in contract management of large EPC contracts. Experience in Pakistan would be an advantage. The CM will spend a minimum 50% of the allocated time in country to mainly do the following:

- (i) Review bidding documents from the contractual point of view;
- (ii) Provide support to PMC and PEDO in contract management;
- (iii) Provide legal support in contract management of the EPC contractor and assist in supervising all works from the contractual management point of view;
- (iv) Execute skills transfer programs for PEDO personnel during all stages of the project;
- (v) Maintain records documenting decisions made at meetings, progress of project implementation and changes to contract plans.

54. The **Geotechnical Expert (GE)** will have a degree in engineering geology or geotechnical engineering, with at least 20 years of experience in geological assessment and geotechnical design of dams, underground works and landslide risk assessment. Relevant work experience in developing countries, preferably in Asia will be preferred. Experience in Pakistan would be an advantage.

55. The GE will be responsible of the review of the design documents according to his expertise, and will provide advice for the design optimization and risk mitigation from a geotechnical point of view. He will also provide support where needed during the construction supervision phase.

56. The **Hydraulic Expert (HE)** will have a degree in hydraulic engineering, with at least 25 years of experience in the design of complex hydraulic structures, with particular focus on dams, tunnels, cavern powerhouse of hydropower projects. He must have successfully completed at least 1 hydropower project of size of at least 300 MW. Relevant work experience in developing countries, preferably in Asia will be preferred. Experience in Pakistan would be an advantage.

57. The HE will provide advice for the design optimization and risk mitigation from a hydraulic point of view, covering dam, spillway, tunnels, bottom outlet, energy dissipation and any other hydraulic aspect of the project. S/he will also provide support where needed during construction supervision phase.

58. The **Sediment Management Expert (SME)** will have a degree in hydraulic engineering or hydrology, with at least 20 years of experience in river hydraulics, dams and hydropower, with particular focus on the sediment management during hydropower plant operations. Relevant work experience in developing countries, preferably in Asia will be preferred. Experience in Pakistan would be an advantage.

59. The SME shall have experience in directing physical hydraulic models and interpreting the related results. S/he will elaborate the sediment management strategy, which will include the joint operation with the upstream Sukhi Kinari HPP. S/he will inform the design of the by-pass tunnel intake in order to mitigate the sediment risk for the plant operation, according to the results of the physical hydraulic model and further analysis that he will undertake. Will provide support to the construction supervision team as needed.

60. The **Hydro-mechanical Expert (HME)** will have a degree in mechanical engineering, with at least 25 years of experience in implementation of hydropower projects, particularly related to design approvals, workshop inspection, installation, erection and commissioning of hydro-mechanical equipment. He must have successfully completed at least 1 Hydropower project of size of at least 300 MW. Relevant work experience in developing countries, preferably in Asia will be preferred. Experience in Pakistan would be an advantage.

61. The HME will spend a minimum 80% of the allocated time in-country to mainly do the following:

- (i) Review the basic and detailed design of hydro-mechanical equipment such as turbines spillway gates, intake gate, draft tube and its gates, and sediment penstock liner.
- (ii) Assist the Team Leader in preparing the project implementation schedule in cooperation with other engineers;
- (iii) Run the entire bid management process for construction works of the hydro-mechanical equipment;
- (iv) Plan and prepare strategy documents of the contractors, regarding hydro-mechanical equipment;
- (v) Review drawings and design documents of the hydro-mechanical equipment produced by the contractor;
- (vi) Supervise, manage and monitor construction process regarding hydro-mechanical equipment;
- (vii) Witness and approve equipment testing and commissioning of hydro-mechanical equipment.
- (viii) Supervise all works of hydro-mechanical equipment;
- (ix) Review the contractor's quality assurance program for hydro-mechanical equipment during design, manufacturing, delivery and construction;

- (x) Ensure adherence to final project design, engineering and schedule of hydro mechanical equipment;
- (xi) Supervise the contractor's activities and enhance the coordination among contractors;
- (xii) Prepare reports and documents specified in TOR.

62. During operation stage:

- (i) Assist the Team Leader in preparing operation and maintenance strategy documents from the point of view of hydro mechanical engineering;
- (ii) Conduct operation and maintenance of hydro-mechanical equipment;
- (iii) Establish a document management system for reports on operation and maintenance activities for hydro mechanical equipment;
- (iv) Establish a quality assurance system for hydro-mechanical equipment;
- (v) Supervise works pertaining to operation of the power plant;
- (vi) Ensure adherence to the project schedule.

63. For specific jobs:

- (i) Record events leading to delays in construction and operational activities;
- (ii) Optimize generation bottlenecks such as availability of water and sedimentation issues;
- (iii) Ensure adoption of all safety measures during construction and operation;
- (iv) Execute skill transfer programs for PEDO personnel during both construction and operation stages;
- (v) Assist in maintaining sound external relations and personnel relations;
- (vi) Maintain records documenting decisions made at meetings, progress of project implementation and changes to contract plans regarding hydro-mechanical equipment.

64. The **Electrical Expert (EE)** will have a degree in electrical engineering, with at least 25 years in implementation of hydropower projects, particularly related to design approvals, workshop inspections, installation, and erection and commissioning of electrical equipment. S/He must have successfully completed at least 1 hydropower project of size of at least 300 MW. Relevant work experience in developing countries, preferably in Asia will be preferred. Experience in Pakistan would be an advantage. The EE will spend a minimum 80% of the allocated time in-country to mainly do the following:

- (i) Review the basic design of electrical equipment such as the generator, exciter, switchgear and related equipment;
- (ii) Assist the Team Leader in preparing the project implementation schedule in cooperation with other engineers;
- (iii) Run the entire bid management process for construction works of the electrical equipment;
- (iv) Plan and prepare strategy documents of contractors, regarding electrical equipment.
- (v) Review drawings and design documents of the electrical equipment produced by the contractor;
- (vi) Supervise, manage and monitor construction process of electrical equipment;
- (vii) Witness and approve equipment testing and commissioning of electrical equipment;
- (viii) Supervise all works of electrical equipment;
- (ix) Review the contractor's quality assurance program of electrical equipment during design, manufacturing, delivery and construction;
- (x) Ensure adherence to final project design, engineering and schedule of electrical equipment;
- (xi) Supervise the contractor's activities and enhance the coordination among contractors.



- (xii) Prepare reports and documents specified in the TOR;
- (xiii) Record events leading to delay in construction and operational activities;
- (xiv) Ensure adoption of all safety measures during the construction stage;
- (xv) Execute skill transfer programs for PEDO personnel during both construction and operation stages;
- (xvi) Assist in maintaining sound external relations and personnel relations;
- (xvii) Maintain records documenting decisions made at meetings, progress of project implementation and changes to contract plans regarding electrical equipment.

## 2. National Experts

65. The **Deputy Team Leader – Resident Engineer (RE)** will have a degree in civil engineering, with at least 25 years of experience in successfully completed construction of a large (Min 300 MW) hydropower projects. The RE will have work experience in developing countries, preferably in Pakistan and/or neighbouring countries, and will preferably have experience working on ADB or other international development agency projects, preferably as resident engineer.

66. The RE will be responsible for managing and coordinating the construction of the project implementation as well as all reporting activities, and liaison with stakeholders. The RE will spend a minimum 90% of the allocated time in-country to mainly do the following:

- (i) Work at the project site to control day-to-day operations of the project and report the TL;
- (ii) Present to the PD and/or GM the technical and financial progress and issues;
- (iii) Conduct overall supervision of activities.

67. During the construction phase, he will:

- (i) Supervise the review of the detailed designs prepared by the EPC Contractors;
- (ii) Supervise preparation of the project implementation schedule and its revisions when required, and finalize it in consultation with PEDO;
- (iii) Supervise the PMC team members' activities such as review and approval of drawings and design documents, supervision, management and monitoring of construction process, witness and approval of equipment testing and commissioning, supervision of all works of contractors, quality assurance, and supervise EPC Contractors' activities and enhance coordination among them;
- (iv) Supervise the consultant team members' in ensuring adherence to final project design, engineering and the schedule;
- (v) Supervise the consultant team members' in ensuring financial, human resource, information technology, and administrative functions;
- (vi) Supervise the consultant team members' in implementing all safeguards matters encompassing both social and environmental aspects following the plans and policies prepared during project preparation;
- (vii) Supervise preparation of reports and documents specified in the TOR.

68. During operation stage:

- (i) Supervise preparation of operation and maintenance strategy documents and finalize them in consultation with PEDO;
- (ii) Supervise the preparation of operation procedure/manual for the hydropower plant, as well as the asset management plan for the plant;
- (iii) Supervise the consultant team members' support to PEDO in conducting operation and maintenance, and supervise the consultant team members' training activities for PEDO appointed team;

- (iv) Supervise establishment of a document management system for reports on operation and maintenance activities;
- (v) Supervise establishment of a quality assurance system;
- (vi) Manage the consultant team members' supervision of works pertaining to operation of the Balakot Hydroelectric Plant;
- (vii) Ensure adherence to project schedule.

69. For specific jobs, he will:

- (i) Supervise the consultant team members' assisting PEDO in implementing all safeguards matters encompassing both social and environmental aspects in accordance with the plans and policies prepared during project preparation;
- (ii) Supervise cost-benefit analysis of deviations in construction phase from planned design, etc;
- (iii) Supervise proper recording of events leading to delay in construction and operational activities;
- (iv) Optimize generation bottlenecks such as non-availability of water and sedimentation issues;
- (v) Take care of all safety measures;
- (vi) Ensure adherence to all statutory requirements;
- (vii) Supervise the execution of skills transfer programs for PEDO personnel;
- (viii) Assist in maintaining sound external relations and personnel relations;
- (ix) Prepare reports for submission to donors on key issues during operation.

70. The **Chief Engineer (CE) for Dams and Surface Works** shall be a CE with 25 years of experience in construction of dams. S/he must have successfully completed at least 1 hydropower project of size of at least 300 MW. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/he will undertake the following tasks, for the part regarding the dam and other civil surface works (roads, bridges, support buildings etc.):

- (i) Review bidding documents from the point of view of construction;
- (ii) Prepare the project implementation schedule in cooperation with other team members.
- (iii) Support in planning and preparation of strategy documents of contractors;
- (iv) Supervise the consultant's team in supervision, management and monitoring of construction process and works;
- (v) Supervise all civil works and supervise the consultant team's supervision activities.
- (vi) Support in ensuring adherence to the schedule of civil works;
- (vii) Supervise contractors' activities and enhance the coordination among contractors.
- (viii) Prepare reports and documents specified in ToR;
- (ix) Record events leading to delay in construction activities;
- (x) Take care of all safety measures during construction;
- (xi) Execute skill transfer programs for PEDO personnel during construction stage.
- (xii) Assist in maintaining sound external relations and personnel relations;
- (xiii) Maintain records documenting decisions made at meetings, progress of project implementation and changes to contract plans.

71. The **Chief Engineer for Underground Works** shall be a CE with 20 years of experience in construction of underground works, as tunnels and powerhouse. S/he must have successfully completed at least 1 Hydropower project of size of at least 300 MW. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/he will undertake the following tasks, for the part regarding the underground works:

- (i) Review bidding documents from the point of view of construction;

- (ii) Prepare the project implementation schedule in cooperation with other team members;
- (iii) Support in planning and preparation of strategy documents of contractors;
- (iv) Supervise the consultant's team in witnessing and approving equipment testing and commissioning;
- (v) Supervise all civil works and supervise the consultant team's supervision activities;
- (vi) Support in ensuring adherence to the schedule of civil works;
- (vii) Supervise contractors' activities and enhance the coordination among contractors;
- (viii) Prepare reports and documents specified in ToR;
- (ix) Record events leading to delay in construction activities;
- (x) Take care of all safety measures during construction;
- (xi) Execute skill transfer programs for PEDO personnel during construction stage;
- (xii) Assist in maintaining sound external relations and personnel relations;
- (xiii) Maintain records documenting decisions made at meetings, progress of project implementation and changes to contract plans.

72. The **Chief Engineer for Electrical** shall be an electrical engineer with 20 years of experience in construction of hydropower plants. S/He must have successfully completed at least 1 hydropower project of size of at least 300 MW. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/he will undertake the following tasks, for the part regarding the electrical works:

- (i) Review bidding documents from the point of view of construction;
- (ii) Prepare the project implementation schedule in cooperation with other team members;
- (iii) Support in planning and preparation of strategy documents of contractors;
- (iv) Supervise the consultant's team in supervision, management and monitoring of construction process and works;
- (v) Supervise the consultant's team in witnessing and approving equipment testing and commissioning;
- (vi) Supervise all electrical works and supervise the consultant team's supervision activities;
- (vii) Support in ensuring adherence to the schedule of electrical works;
- (viii) Supervise contractors' activities and enhance the coordination among contractors;
- (ix) Prepare reports and documents specified in ToR;
- (x) Record events leading to delay in construction activities;
- (xi) Take care of all safety measures during construction;
- (xii) Execute skill transfer programs for PEDO personnel during construction stage;
- (xiii) Assist in maintaining sound external relations and personnel relations;
- (xiv) Maintain records documenting decisions made at meetings, progress of project implementation and changes to contract plans.

73. The **Chief Engineer for Mechanical work** shall be a Mechanical Engineer with 20 years of experience in construction of hydropower plants. S/he must have successfully completed at least 1 hydropower project of size of at least 300 MW. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/he will undertake the following tasks, for the part regarding the Mechanical works:

- (i) Review bidding documents from the point of view of construction;
- (ii) Prepare the project implementation schedule in cooperation with other team members;
- (iii) Support in planning and preparation of strategy documents of contractors;
- (iv) Supervise the consultant's team in supervision, management and monitoring of construction process and works;

- (v) Supervise the consultant teams in witnessing and approving equipment testing and commissioning;
- (vi) Supervise all mechanical works and supervise the consultant team's supervision activities;
- (vii) Support in ensuring adherence to the schedule of mechanical works;
- (viii) Supervise contractors' activities and enhance the coordination among contractors;
- (ix) Prepare reports and documents specified in ToR;
- (x) Record events leading to delay in construction activities;
- (xi) Take care of all safety measures during construction;
- (xii) Execute skill transfer programs for PEDO personnel during construction stage;
- (xiii) Assist in maintaining sound external relations and personnel relations;
- (xiv) Maintain records documenting decisions made at meetings, progress of project implementation and changes to contract plans.

74. The **Electricity Tariff and PPA expert** will have a degree in Electrical engineering or Master in Economics or equivalent, with at least 20 years of experience in the energy sector, of which at least 5 in electricity tariff analysis and Power Purchase Agreement (PPA) negotiations. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/he will undertake the following tasks:

- (i) Review Pakistan's existing renewable energy (hydropower) policy, regulations, strategy and institutional arrangements, and determine their appropriateness in the current project;
- (ii) Review the tariff previously agreed for similar projects in Pakistan;
- (iii) Based on the outcomes from points above, assist PEDO in determining the energy selling tariff which is appropriate for the financial viability of the project;
- (iv) Assist PEDO in the negotiation of the tariff with relevant stakeholders;
- (v) Draft the PPA on behalf of PEDO.

75. The **Civil Engineer for dams** will have a degree in civil engineering, with at least 10 years of experience in design and/or construction of dams. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/He will support the Chief Engineer in the daily supervision of the dam works.

76. The **Civil Engineer for surface works** will have a degree in civil engineering, with at least 10 years of experience in design and/or construction of civil works. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/he will support the Chief Engineer in the daily supervision of the surface civil works (dam excluded). In case of needed, s/he shall be able to support the staff supervising the dam construction during critical stages of the work.

77. The **Quality Assurance Engineer for dams and surface works** will have a degree in civil engineering, with at least 10 years of experience in construction of civil works. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/he will be responsible for the undertake the following tasks:

- (i) Develop, together with the Chief Engineer for dams and surface works, protocols and standards for the inspection, the quality checks and the acceptance tests for the dam and other surface civil works;
- (ii) Supervise the inspection, the quality checks and acceptance tests for the dam and other surface civil works throughout the project implementation up to commissioning, taking care that protocols and standards are followed;

- (iii) Undertake quality audits to monitor the efficiency of the design and construction process, highlighting where improvements are needed, and verifying the required improvements are enforced;
- (iv) Taking care that quality assurance and quality control (QA/QC) documents are properly compiled, reviewed and stored;
- (v) Draft and update the Quality Register to summarize all the quality management activities that are planned or have taken place.

78. The **Civil Engineers for tunnels** will have a degree in civil engineering, with at least 10 years of experience in design and/or construction of underground works. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. They will support the Chief Engineer in the daily supervision of the underground works.

79. The **Civil Engineers for powerhouse** will have a degree in civil engineering, with at least 10 years of experience in design and/or construction of powerhouse works relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. They will support the Chief Engineer in the daily supervision of the underground works.

80. The **Quality Assurance Engineers** will have a degree in civil engineering, with at least 10 years of experience in construction of underground civil works. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/he will be responsible for the following tasks:

- (i) Develop, together with the Chief Engineer for underground works, protocols and standards for the inspection, the quality checks and the acceptance tests for the underground works;
- (ii) Supervise the inspection, the quality checks and acceptance tests for the underground works throughout the project implementation up to commissioning, taking care that protocols and standards are followed;
- (iii) Undertake quality audits to monitor the efficiency of the design and construction process, highlighting where improvements are needed, and verifying the required improvements are enforced;
- (iv) Taking care that quality assurance and quality control (QA/QC) documents are properly compiled, reviewed and stored;
- (v) Draft and update the Quality Register to summarize all the quality management activities that are planned or have taken place.

81. The **Hydro-Mechanical Engineer** will have a degree in mechanical engineering, with at least 5 years of experience in design and/or construction of hydropower plants Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/He will support the Chief Engineer in the daily supervision of the mechanical works.

82. The **Electrical Engineer** will have a degree in electrical engineering, with at least 5 years of experience in electrical design and/or construction of hydropower plants. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/he will support the Chief Engineer in the daily supervision of the Electrical works.

83. The **Transmission Line Engineer** will have a degree in electrical engineering, with at least 10 years of experience in the design and construction of connections between large hydropower plants and local grid. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/he support the Chief Electrical Engineer for the following tasks:

- (i) Review of the design and specifications of the transmission line as per NTDC/PESCO requirements/specifications/design;
- (ii) Supervise, manage and monitor the transmission line construction process and works;
- (iii) Ensure adherence to the schedule of transmission line works;
- (iv) Supervise contractors' activities related to the transmission line;
- (v) Prepare project documents implementation and changes to contract plans related to the transmission line.

84. The **Switchyard Engineer** will have a degree in electrical engineering, with at least 10 years of experience in the design and construction of connection between large hydropower plants and local grid. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. Must also be familiar with NTDC/CPPA-G rules/specifications/protocol. S/he support the Chief Electrical Engineer for the following tasks:

- (i) Review of the switchyard design and specifications as per NTDC/PESCO/CPPA-G requirements/specifications/design;
- (ii) Supervision, manage and monitor of the switchyard construction process and works;
- (iii) Ensure adherence to the schedule of switchyard works;
- (iv) Supervise contractors' activities related to the switchyard;
- (v) Prepare project documents implementation and changes to contract plans related to the switchyard.

85. The **Contract Specialist (CS)** will have a degree in engineering preferably with a Master's degree in Procurement/Contract Law/Contract Management or equivalent, with at least 15 years of experience in contract management of large EPC contracts. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. The CS will mainly do the following:

- (i) Review bidding documents from the contractual point of view;
- (ii) Provide support to PMC and PEDO in contract management;
- (iii) Provide legal support in contract management of the EPC contractor and assist in supervising all works from the contractual management point of view;
- (iv) Execute skills transfer programs for PEDO personnel during all stages of the project;
- (v) Maintain records documenting decisions made at meetings, progress of project implementation and changes to contract plans.

86. The **Quality Assurance Engineers (E&M)** will have a degree in electrical/mechanical engineering, with at least 10 years of experience in construction of hydropower plants. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/he will be responsible to undertake the following tasks:

- (i) Develop, together with the Chief Engineers for electrical and mechanical works, protocols and standards for the inspection, the quality checks and the acceptance tests for the electrical and mechanical works;
- (ii) Supervise the inspection, the quality checks and acceptance tests for the electrical and mechanical works throughout the project implementation up to commissioning, taking care that protocols and standards are followed;

- (iii) Undertake quality audits to monitor the efficiency of the design and construction process, highlighting where improvements are needed, and verifying the required improvements are enforced;
- (iv) Taking care that quality assurance and quality control (QA/QC) documents are properly compiled, reviewed and stored;

87. The **Health and Safety (H&S) Manager** will have a Civil Engineering Degree and 15 years of experience in construction sites, of which at least 5 as H&S manager. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/he will undertake the following tasks:

- (i) Review and approve the H&S management included in the ESMP;
- (ii) Be responsible of monitoring that works are undertaken in compliance with relevant H&S requirements;
- (iii) Manage, maintain and improve safety procedures in the construction site;
- (iv) Establish, update and monitor throughout project implementation the Risk Register;
- (v) Organize and lead the monthly discussion about the Risk Register;
- (vi) Conducting safety training to employees.

88. The **Resettlement Expert (RE)** must be a graduate in social sciences or in a related field, with at least 10 years of experience in resettlement planning and implementation. Experience in infrastructure projects, particularly, in large-scale hydropower projects, is an added qualification. The SRE is expected to possess a good knowledge of involuntary resettlement and indigenous people safeguards policies of ADB and other international financial institutions. The RE's key activities include:

- (i) Review resettlement and indigenous people plans, livelihood restoration plans, and community development plans and work out in detail, their implementation strategies, budgets and timelines. Prepare, if required, additional resettlement and indigenous peoples plans to address social safeguards issues identified during project implementation;
- (ii) Monitor implementation of resettlement plan as agreed by PEDO with ADB and submit timely report to PEDO on any non-compliance with the approved resettlement plan.
- (iii) Assist PEDO in updating Land Acquisition and Resettlement Plan (LARP) as and when needed with first revision at dam design approval stage;
- (iv) Ensure that LARP delineates responsibilities (pertaining to land acquisition, compensation payment, physical relocation and economic rehabilitation of project-affected persons) of PEDO, EPC contractor(s), PM Consultant team, Government of Pakistan agencies, ADB, Independent Advisory Panel and any other parties engaged in BHPP construction and operations;
- (v) Review, update and submit monitoring requirements and budget line items of LARP for approval of PEDO;
- (vi) Orient EPC on ESMP's guidelines on involuntary resettlement and rehabilitation of the project-affected people and its reporting requirements;
- (vii) Coordinate with PEDO's on-site management team on ESMP implementation and reporting requirements, including compensation payment and physical relocation of the project-affected persons and communities;
- (viii) Conduct routine inspection and prepare monitoring reports as per LARP.
- (ix) Where necessary, prepare corrective action plans;
- (x) Coordinate with the environmental specialist, Independent Advisory Panel, and 3rd party external monitoring consultant on the implementation of LARP.

89. The **Gender/community Mobilization Expert (GME)** must be a graduate in social sciences or in a related field, with at least 10 years of experience in gender issue management and community mobilization for large infrastructure projects, preferably in large-scale hydropower projects. The GME is expected to possess a good knowledge of gender action plans and community mobilization plans.

90. The GME is supposed to coordinate and supervise the work of community mobilization, experts and consultants, including monitoring of work/results, and to support PEDO and the PMC in building partnership with stakeholders (local communities).

91. The GME shall support PEDO in the review of the project-specific Gender Action Plan (GAP) submitted by the contractor. The GME shall ensure that the GAP includes clear targets, quotas, design features and quantifiable performance indicators to ensure gender equality in participation to the project and related benefits. The GME shall monitor that the procedures and measures included in the GAP are successfully implemented throughout the entire duration of the project.

92. The **Environmental Expert (EE)** will be a graduate in environmental science, engineering, or related field with at least 10 years of experience in implementation of large-scale infrastructure projects including large hydropower projects, particularly related to development and implementation of environmental management plans according to ADB and/or other international financial institutions' guidelines. The ES will mainly do the following:

- (i) Review the EIA, SIA, EMP, and other supplemental environmental assessments, and prepare necessary inputs into the ESMP, which includes the following:
  - Environmental Management and Monitoring Plan
  - Pollution prevention plan
  - Waste management plan
  - Health and safety management plan
  - Traffic management plan
  - Emergency preparedness and response plans
  - Biodiversity monitoring plan
  - Social and cultural heritage management and monitoring plan
  - Livelihood restoration plan
  - Community development plan
  - Catchment management plan
- (ii) Ensure that the ESMP documents clearly delineate respective responsibilities of the PEDO, EPC contractor(s), the PM Consultant team, Government of Pakistan agencies, ADB, and any other parties engaged in BHPP construction and operations (e.g., Independent Advisory Panel);
- (iii) Review and update the monitoring requirements and respective budget line items of the ESMP for confirmation by PEDO and ADB;
- (iv) Provide orientation to the EPC on ESMP requirements including construction equipment (e.g., for emission controls), physical construction specifics (e.g., dust and erosion control, and waste management), and EPC's reporting requirements;
- (v) Coordinate with the PEDO on-site management team on ESMP implementation and reporting requirements;
- (vi) Conduct routine inspections and prepare monitoring reports as required by the ESMP, including notice of deficiencies and corrective actions taken;
- (vii) Coordinate with the social safeguards expert(s) and other parties (e.g., Independent Advisory Panel and 3rd party monitoring) for ESMP implementation.



93. The **Document Controller (Monitoring)/Finance Expert** will have a degree in Civil Engineer and Finance and 15 years of experience in construction companies related to financial and administrative matters. Relevant work experience in developing countries is required, preferably in Asia. International experience would be an advantage. S/he will be generating/consolidating financial reports and will support Resident Engineer/Deputy Team Leader in the overall financial and administrative matters of the project. S/he will undertake the following tasks:

- (i) Setup and maintain the Document Control system (DCS);
- (ii) Monitor compliance to the DCS, and require compliance to the DCS when not achieved by the parties involved in the project (PEDO, EPC contractor, designer, stakeholders);
- (iii) Ensure that all documents, included drafts and intermediate versions, are stored;
- (iv) Ensure that correct versions and revisions of the documents are circulated;
- (v) Manage, distribute and document feedback, responses and incoming documents from all the parties involved;
- (vi) Record and if required track the mailing and distribution of the documentation.

### **3. National Support Staff**

94. All national support staff below shall assist the Project Manager, Resident Engineer and Chief Engineers, in fulfilling tasks assigned to them. They will report directly to the Chief Engineers and will include the following:

- (i) Inspectors (Dams & Surface Works)
- (ii) Inspectors (Underground Works)
- (iii) Inspectors (E&M Works)
- (iv) Cost/time controller
- (v) Office support staff (engineers)
- (vi) Office support staff (CAD technicians)

95. National support staff shall hold a qualification and experience in their respective field of study assigned to the individual's job title in the PMC team. Inspectors and Cost-time controller shall have at least 5 years of experience on site. Additional national support staff include:

- (i) Administrative Officer
- (ii) Accounts Officer
- (iii) Assistant Accounts Officer
- (iv) Office Secretary
- (v) Drivers
- (vi) Runners and Helpers

### **7. Client's Input and Counterpart Personnel**

96. The client will make services, facilities, and property available to the PMC.

## TERMS OF REFERENCE OF EXTERNAL ENVIRONMENTAL MONITOR

### National Individual Consultant

1. **Objective of the Assignment.** The major objective of the assignment is conducting independent environmental monitoring during the construction phase of the Balakot Hydropower Development Project in coordination with the Pakhtunkhwa Energy Development Organization (PEDO) and following ADB's Safeguards Policy Statement (SPS 2009) and national environment laws. The focus of the assignment is on the project's significant environmental impacts and risks. The external environmental monitor (EEM) will complement the work of the environment specialists of the project management consultant (PMC) and project implementation unit (PIU) by verifying critical environmental parameters of the project independently.
2. **Input and timing.** The expected input is 6 person-months intermittently, specifically during construction works with high potential of significant environmental impacts. The schedule will be coordinated with the PIU at the beginning of the assignment.
3. **Scope of Work.** The EEM will visit the project area as required to undertake an independent assessment of implementation of the environmental management plan (EMP) by the engineering, procurement and construction (EPC) contractor, particularly during construction at the sites and construction activities posing significant environmental risks.
4. **Detailed Tasks and/or Expected Output.** The expert will undertake the following tasks:
  - (i) Ensure that all the contractual obligations related to the environmental and social compliance are met by (a) familiarizing him/herself with project's environmental provisions in loan agreements and contractual obligations, environmental assessment and environmental planning documents including Environmental Impact Assessment, EMP and EPC contractor (site-specific) EMPs, environmental sections in bills of quantities specifically on environmental aspects posing significant environmental risks and/or having significant environmental impacts; (b) monitoring EMP implementation and identifying potential non-compliances for critical parameters; and (c) Reporting on identified non-compliances and suggesting mitigation measures.
  - (ii) Monitor environmental performance of the project during design and construction stages as stipulated in the EMP. The EEM will (a) ensure that the detailed design of the project in areas posing significant environmental risks avoids, mitigate or minimize those impacts; (b) engage certified analytical laboratory to conduct selective instrumental testing of selected environmental parameters (air and water quality, noise, etc) at the environmentally sensitive locations; and (c) conduct environmental monitoring of other critical parameters of the project.
  - (iii) Oversee compliance of the critical parameters of monitoring programs as given in EMP by verifying environmental monitoring programs of the EPC Contractor, specifically for significant environmental risks and sensitive receptors; and providing recommendations to improve the environmental monitoring programs, if necessary.
  - (iv) Check randomly whether monitoring of the environmental aspects of the project during construction is being properly carried out. The EEM will (a) develop an environmental monitoring program to complement regular environmental monitoring by the environment specialist of the PMC (Engineer) by verifying critical environmental parameters of the project independently; (b) evaluate the effectiveness and/or

- deficiencies in compliance monitoring by the PMC; (c) assess effectiveness of implementation of the grievance redressal mechanism and extent of addressing of complaints; and (d) conduct spot feedback consultation sessions with key stakeholders at key receptor locations (residences, hospitals, schools etc.) to assess implementation of mitigation measures along with their frequency and effectiveness to mitigate undesirable impacts.
- (v) Document monitoring results, and identify necessary corrective and preventive actions in the periodic monitoring reports (bi-annual reporting), and follow up on these actions to ensure progress toward the desired outcomes.
  - (vi) Ensure that the EPC contractor is implementing their suggested additional measures.
  - (vii) Report the status of EMP implementation to PEDO. The EEM will conduct meetings, and discuss environment-related issues with all key project staff of PEDO, the EPC contractor and the PMC.

5. **Minimum qualification requirements.** The EEM should at least have (i) a master's degree in a relevant field; (ii) 7 years general experience in environmental management and monitoring, preferably in developing countries; and (iii) 5 years specific experience relevant to the assignment. Knowledge of safeguard procedures of international donor organizations, such as ADB or World Bank, and experience in Central and West Asia and Pakistan are preferred.

## TERMS OF REFERENCE OF EXTERNAL RESETTLEMENT MONITOR

### National Individual Consultant

1. **Objective of the assignment.** The Pakhtunkhwa Energy Development Organization (PEDO) intends to construct a 300 megawatt (MW) run-of-river hydropower plant with related infrastructure at Balakot, Mansehra District of Khyber Pakhtunkhwa, Pakistan. The project site is located on the Kunhar River about 18.6 km upstream of the town of Balakot. The project is a run-of-river type, located on the Kunhar River in the Khyber Pakhtunkhwa province of Pakistan, in the 12 km stretch from Paras to Sangar Village. All parts of the Project are located on the left bank of the Kunhar River. The dam site is about 18.6 km upstream of the town of Balakot while the powerhouse is located 8 km upstream of Balakot, near Kapi Gali Village.
2. The project has involuntary resettlement impacts. Initial assessment based on preliminary design shows that the project will result in loss of residential commercial and public structures, livelihood, lands, fruit and timber/firewood trees and crops.
3. The reservoir and dam, staff colony, construction camps and access roads require 81 acres or 648 kanals (32.8 hectare). All the land acquisition for the project will be considered permanent, as the law (LAA 1894) does not allow authorities to acquire land temporarily for more than three years. Of the total required land, 10 acres (80 kanal) will be required for staff colony, 10 acres (80 kanal) will be required for 2 construction camps, 3.28 acres (26.24 kanal) will be required for access roads and 57.72 acres (461.76) for the reservoir and dam. A total of 165 households (AHs) with 887 members (APs) will potentially be affected. Additional impacts may be expected from the soil disposal. Details of the known potential impacts are provided in Table 1.

**Table 1: Affected Households and Persons**

Category	AHs	APs	Without Double Counting	
			AHs	APs
Loss of Cultivated Lands	87	440	87	440
Loss of Uncultivated Lands	36	226	24	144
Loss of Residence	129	712	54	303
Loss of Fruit Trees	109	604		
Loss of Wood Trees	93	535		
Loss of Commercial Structures	5	26		
Loss of Livelihood (crop production)	87	440		
Loss of Livelihood (Business)	1	6		
Severely Affected	133	730		
Vulnerable Households	29	152		
<b>Total</b>	<b>165</b>	<b>887</b>	<b>165</b>	<b>887</b>

4. As per the Asian Development Bank (ADB) Safeguard Policy Statement (SPS, 2009), a draft land acquisition and resettlement plan (LARP) was prepared based on preliminary design. Once the detailed design and final alignment is approved, the LARP will be finalized based on a census, detailed measurement surveys, follow-up consultations, and valuation of the affected assets following the notification of Section 4 and 5 of the Land Acquisition Act (LAA, 1894).
5. LARP implementation is subject to both internal and external monitoring. PEDO is required to ensure that (i) no land shall be acquired for the purposes of the Project under the emergency acquisition provisions of the LAA; and (ii) no physical or economic displacement takes place in

connection with the project until (a) compensation and other entitlements have been provided to APs in accordance with the final LARP, and (b) a comprehensive income and livelihood restoration program has been established in accordance with the final LARP.

6. PEDO has already established a project implementation unit (PIU) for the project. A Social and Environment Unit (and a Purchase of Land Unit will be established within the PIU, which will be responsible for LARP implementation with support from the project management consultant (PMC).

7. The project will be implemented through an engineering, procurement and construction (EPC) contract. Hence, the installation and construction phase (and commencement thereof) is conditional to: (i) the submission to and clearance by ADB of a final LARP for the project based detailed design; and (ii) PEDO's notification to the contractor and ADB in writing that due consultation, compensation payments and other entitlements have been provided to affected peoples (Aps) fully in accordance with the approved final LARP as verified by an external resettlement monitor (ERM).

8. PEDO requires the services of an independent experienced individual consultant (ERM) to carry out the periodic external monitoring of the final LARP, including the income and livelihood restoration program on an intermittent basis.

9. **Timing and input.** The ERM assignment is on an intermittent basis. Payments shall be linked to the outputs and timely submission of deliverables. Milestones will be finalized during contract negotiations. The expected input is 9 person-months intermittently between pre-construction and post-resettlement.

10. **Scope of work.** The ERM will review the LARP implementation, and assess the (i) achievement of resettlement objectives, (ii) restoration of the economic and social conditions of the displaced persons, (iii) effectiveness and impacts of the proposed entitlements, (iv) need for further mitigation measures if any, and (v) institutional arrangements and capacity to implement the LARP. External monitoring should confirm if compensation payments have been completed in sections with land acquisition and resettlement impacts which can be handed over for civil works and timely advise PEDO to make decisions on corrective measures, if required, to implement the LARP effectively.

11. **Detailed tasks and/or expected outputs.** The major tasks for the ERM include the following:

- (i) Identify, through field verification and review of records, any gaps in the resettlement baseline information, including list of APs, vulnerable groups, affected assets and livelihood, and suggest steps to update the data.
- (ii) Review and verify the effective implementation of the LARP (including the income and livelihood restoration program) according to requirements of the loan covenants and ADB involuntary resettlement safeguards.
- (iii) Monitor and assess whether resettlement objectives of enhancing, or at least restoring the livelihoods of all APs in real terms relative to pre-project levels and improving the standards of living of the displaced poor and other vulnerable groups have been met.
- (iv) Review and verify results of internal monitoring reports prepared by the PIU through

review of records and random field-visits involving APs and community groups.

- (v) Assess the adequacy of information disclosure and consultation activities in meeting the disclosure and meaningful consultation requirements as per ADB SPS (2009).
- (vi) Assess if the required grievance redress mechanism for the project is existing and functional, and status and actions taken on grievances received; and recommend measures for improvements, if required.
- (vii) Verify completion of compensation payments in sections with land acquisition and resettlement issues and confirm which sections can be handed over for civil works.
- (viii) Identify problems/potential problems and emerging land acquisition and resettlement issues during project implementation, and recommend to PEDO the required corrective actions and measures to mitigate problems.
- (ix) Verify if the livelihoods and the standard of living of APs, including those of the non-titled displaced persons, are restored or improved.
- (x) Within 6 months prior to project closing, conduct a post-evaluation of the implementation of the LARP (including the income and livelihood restoration program) and learn strategic lessons for future policy formulation and planning.

12. Monitoring indicators. The monitoring will assess the extent to which the provisions in the LARP are being followed and if objectives are being met. Some key indicators for external monitoring include the following:

**Table 2: Indicators for Verification by External Monitor**

<b>Monitoring Indicator</b>	<b>Basis for Indicator</b>
Basic information on APs' households (gender-disaggregated data essential for all aspects)	Location Composition and structure, ages, education and skill levels Gender of household head Ethnic group Access to health, education, utilities, and other social services Housing type Land and other resource-owning and -using patterns Occupations and employment patterns Income sources and levels Agricultural production data (for rural households) Participation in neighbourhood or community groups Access to cultural sites and events Valuation of all assets
Restoration of living standards	Were house compensation payments made free of depreciation, fees, or transfer costs to the APs? Have APs adopted the housing options developed? Have perceptions of community been restored? Have APs achieved replacement of key social and cultural elements?
Restoration of livelihoods (Disaggregate data for APs moving to group resettlement)	Were Compensation payments free of deductions for depreciation, fees, or transfer costs to the displaced persons? Were compensation payments sufficient to replace lost assets? Was sufficient replacement land available of suitable standard? Did income substitution allow for re-establishment of enterprise and production?

Monitoring Indicator	Basis for Indicator
sites, self-relocating APs, APs with enterprises affected)	Have affected enterprises received sufficient assistance to re-establish themselves? Have vulnerable groups been provided income-earning opportunities? Are these effective and sustainable? Do jobs provided restore pre-project income levels and living standards?
Levels of APs' satisfaction	How much do the APs know about resettlement procedures and entitlements? Do the APs know their entitlements? Do they know if these have been met? How do the APs assess the extent to which their own living standards and livelihoods have been restored? How much do the APs know about grievance procedures and conflict resolution procedures?
Effectiveness of resettlement planning	Were the APs and their assets correctly enumerated? Was the time frame and budget sufficient to meet objectives, were there institutional constraints? Were entitlements too generous? Were vulnerable groups identified and assisted? How did resettlement implementers deal with unforeseen problems?

13. **Methodology.** The ERM will review the data and process of the detailed measurement survey (DMS), census and socio-economic surveys to establish the baseline for monitoring and evaluating project benefits. The review will include a review of records (including database, DMS records, questionnaires), a random sample interview using a structured questionnaire and focused group discussions with some APs. The sample size for the sample interviews will be proportionate to the number of APs in each section/package. The interviews and focus group discussions will check the DMS process from identification to agreement on DMS results, and evaluate if DMS activities were carried out in a participatory and transparent manner.

- (i) The ERM will synchronize its AP and asset database with the PIU database to come up with a common baseline for internal and external monitoring. The database will include validated data on affected assets and categories of APs, including those who are severely affected, vulnerable, requiring relocation, with legal and administrative impediments (i.e. out of the project area), with inheritance mutations, with disputes, with missing documentation.
- (ii) The result of the review will be presented in an inception report which will include the validated list of APs and affected assets, review of the LARP updating process, a monitoring work plan (including the preparation of audit reports and semi-annual monitoring reports), and recommendations for addressing gaps noted in the review. The inception report will be submitted to the PIU and ADB for review and approval.
- (iii) Resettlement audit. For sections to be handed over for clearing and civil works, the ERM will review the status of compensation award as per Section 11 of the LAA through review of records and random interviews of APs. The review will confirm disbursement of compensation payments and cash assistance (including applicable rehabilitation assistance/allowances: relocation assistance, livelihood restoration allowance, severe impact allowance, income loss compensation); and adequacy of notification and consultations. The review will also assess cases with legal and administrative impediments to compensation, including adequacy of actions taken by the project to address these impediments. Based on the review, the ERM will submit resettlement audit reports confirming the sections/sites that may be handed over for

civil works.

- (iv) Six months after mobilization and every 6 months during the implementation of the project, the ERM will undertake regular external resettlement monitoring to cover (i) the overall progress in compensation payments, (ii) status of income and livelihood restoration activities including employment of APs in project-related jobs, (iii) land acquisition and resettlement issues and non-compliances arising during project implementation, (iv) grievance redress mechanism and status of complaints, (v) information disclosure, (vi) and consultation activities. These semi-annual reports will be submitted to PEDO and ADB for review and will be uploaded on the ADB website for disclosure. Input to these semi-annual external monitoring reports is the internal monitoring report to be prepared by the PMC.
- (v) A post-resettlement survey will be carried within 6 months before the closing of the project. Sampling for the will include 100% of severely affected and vulnerable households, as well as at least 30% of all other APs. The post-resettlement survey results will be compared with the baseline information collected by the ERM at the start of his/her assignment. Focus group discussions will also be conducted with APs and relevant agencies to help compare pre and post-LARP condition of the APs. Results will be presented through a post-resettlement/final report which will also be submitted to PEDO and ADB for review and disclosure;

14. **Reporting requirements.** The ERM will prepare the reports below in ADB format, and submit them to PEDO for onward transmittal to ADB. An abbreviated version of the monitoring report will be provided in accessible places (i.e. village and district heads offices) and in Urdu/Pashtu for the information of APs.

- (i) an inception report, including baseline survey report, final list of APs and assets, draft formats (as appropriate for various outputs, such as questionnaires, guides, etc.) and draft outlines for various reports (including resettlement audit reports, semi-annual monitoring report and post-LARP implementation/final report within 1 month from mobilization;
- (ii) two-section/package-specific resettlement audit reports within 2 weeks after receipt of request for handing over for civil works (supported by a compensation monitoring/progress report);
- (iii) eight semi-annual monitoring reports (two reports x 4 years) within 6 months from mobilization and every after 6 months to monitor implementation of the remaining compensation payments (including those with legal and administrative impediments) and the livelihood restoration activities; and
- (iv) post-LARP implementation/final report within 6 months before closing of the project.

15. **Change of scope.** The ERM will adhere to any change in scope of work, after consultation with PIU and in true spirit of monitoring and evaluation of resettlement activities during his period of engagement.

16. **Minimum qualification requirements.** The consultant should: (i) be well-versed in operational research, latest tools and techniques; (ii) have masteral degree in social sciences, anthropology, social/rural development, economics, sociology or other related degree, or



bachelor's degree in civil engineering; (iii) have proven track record of 10 years or more in the preparing, monitoring and evaluating development projects, with focus on resettlement monitoring; (iv) be familiar with ADB SPS (2009) and land acquisition related to Pakistani laws and regulations; and (v) have good English writing skills.

17. The ERM can hire two social mobilizers/enumerators (one male and one female) to support data collection and processing, consultations and reporting. Qualifications of the social mobilizers/enumerators include: (i) a degree in social/community development, sociology or related fields; and (ii) at least 3 years experience in data collection, surveying and public consultations.

## TERMS OF REFERENCE OF COMMUNITY DEVELOPMENT PROGRAM NGO National NGO-Consulting Firm

1. **Project background.** The Pakhtunkhwa Energy Development Organization (PEDO) with the financial assistance of Asian Development Bank (ADB) intends to construct a 300 megawatt (MW) run-of-river hydropower plant (the "Project") with related infrastructure at Balakot, Mansehra District of Khyber Pakhtunkhwa, Pakistan. The project site is located on the Kunhar River about 18.6 km upstream of the town of Balakot. The project is a run-of-river type, located on the Kunhar River in the Khyber Pakhtunkhwa province of Pakistan, in the 12 km stretch from Paras to Sangar Village. The hydel power potential available in this stretch of the river will be utilized for the project. All parts of the project are located on the left bank of the Kunhar River. The dam site is about 18.6 km upstream of the town of Balakot. The powerhouse is located 8 km upstream of Balakot, near Kapi Gali Village.
2. It is expected that the project will have direct and indirect impacts on the six settlements within and near the project site (Bela Balseri, Nehan, Rahtar, Dhab, Sangar and Kappi Gali). All these settlements are in tehsil Balakot of district Mansehra. Four settlements are at the dam site (Bela Balseri, Nehan, Rahtar and Dhab), one is at staff colony site (Sanger) and one at access road (Kappi Gali). Most of the affected settlements are along the national highway N-15 and linked through unsealed roads. Among the residents in the area, most affected are the 165 households in the villages of Bela Basehri, Nihan, Dhab, Rehtar, Sangar and Kappi Gali which will lose their lands, structures and other assets as a result of the project.
3. In addition to the hydel power infrastructure, a community support/development program, therefore, has been designed under the project to cater to the socio-economic needs of the six affected and other surrounding communities in the project area. This will improve the livelihood opportunities for the displaced households and adjacent communities in the project area including women and vulnerable segments of the population; build their resilience towards economic downturn; and increase their awareness about risks such as: health, climate change, natural disasters and other contextually relevant issues.
4. **Objective of the assignment.** The project will hire a full-time consultant-nongovernment organization (NGO) to implement the community support/development program as part of the Gender Action Plan (GAP) developed for the project. The NGO will work under the supervision of PEDO and supported by Project Management Unit (PMU).
5. **Timing and input.** The team will be engaged for 3 years from the project's commencement.
6. **Scope of work.** The consultant-NGO under the close supervision of PEDO, the project management unit (PMU), the Project Implementation Consultants (PICs), and the heads of affected villages will be responsible for the following tasks:
  - (i) Develop and implement gender-responsive community mobilization strategy
    - Conduct participatory consultations with men and women affected persons (APs) and community groups on project related activities, project impacts, benefits of the project and information sharing, at different stages of project implementation.
    - Organize village level committees to address the needs and concerns of APs and the local communities. Ensure that women have equitable access to these committees established under the project.

- Ensure that the implementation of the resettlement plan include needs and concerns of both men and women (elderly, widowed, disabled, single and other vulnerable segments of the population)
  - Ensure that affected women and disadvantaged groups receive fair compensation against their respective entitlements and claims and ensure that grievances from women are collected and recorded separately by women social mobilizers.
  - Collect baseline gender disaggregated data against the key targets and indicators of GAP and Community Support Program.
- (ii) Develop and implement livelihood improvement program
- Conduct assessment of the value chain of electricity driven enterprises (including backward and forward linkages, skill sets for men and women APs and residents in the affected villages, market analysis for employability etc.).
  - Develop and implement skill development program based on the findings of the value chain assessment and market analysis for men and women of the affected and vulnerable households in the project.
  - Develop value-added business models to provide employment opportunities for women including affected and vulnerable households in the project.
  - Build linkages of the women groups with micro-finance institutes, market, government supported livelihood and social protection programs and other support networks for increased access to livelihood opportunities.
  - Support the PMU in linking affected households (AHs) and residents in the affected villages to job opportunities in the project during project construction, including women.
  - Facilitate the conduct of training for AHs and residents in the affected villages on skills required from the project (i.e. welding, plumbing, driving etc.).
  - Assist SEU in receiving applications from the interested AHs and other residents in the affected villages in different disciplines and help arrange trainings of the APs from one or more reputed vocational training institutions within Pakistan.
- (iii) Develop and implement training and knowledge sharing programs for communities
- Educate communities on social and gender issues such as importance of educating girls, reproductive health of women, pre- and post-natal care, nutritional needs and growth monitoring of children etc.
  - Conduct training and knowledge sessions for school staff (including school administration, teachers and students) on modern teaching techniques, use of information technology, and resilience towards natural disasters and climate change.
- (iv) Develop and implement awareness raising programs on climate change and natural disasters
- Conduct awareness raising sessions on issues related to climate change and environment (issues such as: de-forestation, water conservation, water pollution, energy conservation etc.)
  - Organize and train mothers and youth groups in surrounding schools and committees as climate change leaders to create awareness on issues related to climate change.
  - Organize plantation campaigns in the project area involving youth groups, community organizations and local administration.

(v) Strengthen institutional capacity of PEDO in developing and implementing socially inclusive and gender-responsive energy sector projects

- Conduct knowledge sharing and learning events for PEDO and policy makers for creating conducive work environment and Human Resource Development (HRD) opportunities with a strong emphasis on encouraging the recruitment of women staff in energy sector in compliance with the government recruitment policies.
- Develop toolkits and guidelines for developing gender inclusive energy sector projects.
- Institutionalize social and gender responsive HR policies and procedures
- Collect evidence and document good practices on social and gender impacts of the project.

7. **Expected outputs.** The consultant-NGO will submit (i) an inception report within 3 weeks of signing up of the contract including a technical proposal, budget, a workplan for the whole contract period, and staffing and personnel deployment plan; (ii) quarterly and semi-annual progress report against the targets, indicators and deliverables agreed with the client; and (iii) a completion report at the end of the assignment.

8. **Required team composition and qualifications.** The team of consultant-NGO shall be composed of (i) team leader for the overall CDP deliverables and quality assurance, (ii) social development and gender expert, (iii) social mobilizers (men and women), (iv) livelihood expert, (v) climate change expert, and (vi) monitoring and evaluation expert.

9. The consultant-NGO should have:

- (i) extensive experience in working with international and bilateral development agencies,
- (ii) considerable outreach at the provincial level and project area,
- (iii) field offices and operational team in the project area,
- (iv) demonstrated expertise in implementing similar community development programs linked to infrastructure projects in sectors such as water and hydropower,
- (v) extensive work experience with rural communities and expertise in livelihood development programs, climate change and social sector,
- (vi) demonstrated experience (more than 10 years) in implementing gender and development programs.

## GENDER ACTION PLAN

Outputs/Objectives	Activities	Performance Targets/Indicators	Responsible	Timeframe
Output 1: Climate-resilient hydropower plant commissioned				
1. Gender-mainstreamed community mobilization strategy developed and implemented	1a. Conduct participatory consultations with men and women groups on project related activities and impacts, and information sharing 1b. Campaign for and support women's representation in community-based forums, such as: village committees, grievance committees and other community-based organizations established under the project.	1a. At least 3 broad-based consultations held with men and women groups in the project area. 1b. Village committees have 30% women representation.	PIU-PEDO Gender Specialist (GS) and Consultant - NGO hired for the community development component	1a. Year 1–5  1b. Year 2–3
2. Gender-responsive Land Acquisition and Resettlement ensured	2a. List affected women and disadvantaged groups and record their grievances and compensations received against their respective entitlements and claims.	2a.1. Sex-disaggregated grievances and compensation recorded and available 2a.2. Social mobilization team hired by the NGO includes at least 40% female social mobilizers 2a.3. Monitoring systems and reports on compensation and resettlement issues are sex disaggregated with actions to address concerns of women, elderly, disabled and vulnerable groups		2a.1–2a.2 Year 1–2  2a.3. Year 1–3
3. Increased awareness on social and gender issues	3a. Educate communities on social and gender issues such as importance of educating girls, reproductive health of women, pre- and post-natal care, nutritional needs and growth monitoring of children etc. 3b. Conduct training and knowledge sessions for school <sup>19</sup> staff on modern teaching techniques, use of information technology.	3a. At least 2 sessions in project communities conducted per year on the importance of educating girls, reproductive health of women, pre- and post-natal care, nutritional needs and growth monitoring of children etc. 3b. At least 100 teachers (with 50% women) trained in modern teaching techniques, use of information technology.		PIU-PEDO GS and Consultant - NGO  3a. Q1 of Year 2–3  3b. Q2 of Year 2–4
Output 2: Capacity for climate change risk management in hydropower production enhanced				
4. Climate Change Awareness created	4a. Conduct training for PEDO staff on climate change impact mitigation and adaptation for hydropower projects.  4b. Conduct awareness raising sessions on issues related to climate change and environment (deforestation, water conservation, water pollution,	4a. By 2023, training of at least 30 PEDO staff (at least 50% are female) on climate change impact mitigation and adaptation for hydropower projects (2020 baseline: 0) 4b. By 2023, awareness campaign with at least 30% women and girls' participation on climate change impact and mitigation measures launched (2020 baseline: 0)	PIU-PEDO GS and Consultant - NGO	4a. From Q2 of Year 2  4b–c. Q2 of Year 2–3

<sup>19</sup> Schools = those affected under the project and re-constructed by the Khyber Pakhtunkhwa Government Education Department

Outputs/Objectives	Activities	Performance Targets/Indicators	Responsible	Timeframe
	energy conservation, gender and climate change nexus etc.) 4c. Organize and train youth and mothers' groups in surrounding schools and communities as change makers and leaders of climate change issues 4d. Organize plantation campaigns in the project area involving youth groups, community organizations and local administration	4c.1. Youth groups and committees have 30% women and girls 4c.2. Mothers' groups trained as climate change leaders – 2 groups in each settlement 4d. At least 2 plantation campaigns organized per year with 30% participation of women and girls		4d. From Q3 of Year 2
<b>Output 3: PEDO's revenues from indigenous resources increased</b>				
5. Institutional capacity of PEDO improved in developing and implementing gender-inclusive energy sector projects	5a. Provide employment opportunities to women under the project 5b. Develop toolkits and guidelines for developing gender inclusive energy sector projects 5c. Institutionalize social and gender responsive policies and procedures 5d. Document good practices and gender impacts of the project	5a. At least 20% of the people employed are female. 5b. One toolkit and guidelines for mainstreaming gender in energy projects prepared and PEDO staff trained 5c.1. Human Resources policies and procedures of PEDO are gender sensitive 5c.2. At least 1 reward and recognition program conducted for gender champions annually 5d.1. Two studies per year on good practices and gender impacts prepared and published 5d.2. One video documentary on project pre and post social and gender impacts prepared	PEDO GS	5a. Q1 of Year 2 –3 5b. Year 2 5c.1. Year 2 5c.2. annually 5d.1. Mid and end Year 5d.2. Year 1 and posting of project
<b>Output 4: Income-earning opportunities and skills for local communities increased</b>				
6. Increased access to livelihood opportunities through Skill Development Program	6a. Conduct assessment of the value chain of electricity driven enterprises (including backward and forward linkages, skill sets for men and women, market analysis for employability). 6b. Develop and implement skill development program based on the value chain assessment for men and women of the affected and vulnerable households in the project. 6c. Develop value-added business models to provide employment opportunities for women including affected and vulnerable households in the project.	6a. One assessment on value chain of electricity driven enterprises prepared. 6b.1. One Skill Development Program developed and implemented. 6b.2. Terms of references of NGO include implementation of skill development program 6b.3. 500 community members trained in livelihood skills with 50% women participation (baseline 2020: 0) 6c. Four value added business models developed.	PIU-PEDO GS and Consultant - NGO hired for the Community Development Component	6a. Q3 of Year 1 6b.1–6b.3. Q1 of Year 2 6c. Q3 of Year 2–4

NGO = non-government organization = PEDO = Pakhtunkhwa Energy Development Organization, PIU = project implementation unit, Q = quarter

## CLIMATE CHANGE ADAPTATION AND MITIGATION PLANS

### A. Climate Change Adaptation Plan

<b>Adaptation Activity</b>	<b>Target Climate Risk</b>	<b>Estimated Cost (\$ million)</b>	<b>Adaptation Finance Justification</b>
Disaster-resilient dam design and construction	Increased magnitude of peak floods	4.58	Seismic strengthened design has co-benefit of resilience to flood and landslide impacts. It is not feasible to estimate incremental cost of adaptation, due to lack of baseline scenario. Therefore, a conservative amount of 10% is attributed to adaptation, with the remaining 90% attributed to mitigation finance.
Slope stabilization measures in the reservoir rim	Increased landslide risk	0.25	Infrastructural investment with distributed benefits, including climate change risk mitigation. Incremental cost not feasible to calculate. Therefore, 25% of slope stabilization costs attributed as adaptation.
Climate resilient cascade operation and management of the hydropower schemes	Decrease of water availability during low flow period (peaking); Increased sediment inflows and sediment peaks	1.00	Automation, control and communication equipment for integrated operation of the cascade hydropower projects. Capacity building to improve coordinated operation and risk management.
Implementation of a climate monitoring and coordination framework	Increased flood and landslide risk, change in pattern and level of precipitation, increased sediment load (climate variability and scenario uncertainty)	1.00	Capacity building, equipment, and policy dialogue to improve climate risk management in hydropower production. Includes mainstreaming of climate change consideration into dam operating procedures, cascade optimization, sector engagement, disaster risk management and awareness in the community.
Update of the project climate modelling	Increased flood and landslide risks, change in pattern and level of precipitation, increased sediment load (climate variability and scenario uncertainty)	0.20	Technical services to improve information, planning and decision making.
<b>Total</b>		<b>7.03</b>	

Source: Asian Development Bank.

**B. Climate Change Mitigation Plan**

<b>Mitigation Activity</b>	<b>Estimated GHG Emissions Reduction (tCO<sub>2</sub>e/year)<sup>a</sup></b>	<b>Estimated Mitigation Cost (\$ million)</b>	<b>Mitigation Finance Justification</b>
Large hydropower generation plant including dam and associated facilities	572,643	\$747.97	Construction and commissioning of low carbon grid-connected power generation. Plant is run-of-river and incremental methane emissions are expected to be limited due to negligible due to small capacity and surface area of pondage.

tCO<sub>2</sub>e = tons of carbon dioxide equivalent.

<sup>a</sup> Net generation: 1143 GWh per year. Grid emissions factor: 501 tCO<sub>2</sub>/GWh (IFI Harmonized Grid Factors).

Source: Asian Development Bank.