Project Readiness Financing
Project Administration Manual

Project Number: 52051-003
Loan Number:
November 2021

Islamic Republic of Pakistan: Preparing Kurram Tangi Integrated Water Resources Development Project

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Project Administration Manual for Project Readiness Financing: Purpose and Process

The project administration manual (PAM) for the project readiness financing (PRF) is an abridged version of the regular PAM of the Asian Development Bank (ADB) and describes the essential administrative and management requirements to implement the PRF following the policies and procedures of the government and ADB. The PAM should include references to all available templates and instructions either by linking to relevant URLs or directly incorporating them in the PAM.

The executing and implementing agencies are wholly responsible for the implementation of ADB-financed PRF projects, as agreed between the borrower and ADB, and following the policies and procedures of the government and ADB. ADB staff is responsible for supporting implementation, including compliance by executing and implementing agencies of their obligations and responsibilities for PRF project implementation following ADB's policies and procedures.

In the event of any discrepancy or contradiction between the PAM and the loan agreement, the provisions of the PRF loan agreement will prevail.

After ADB's approval of the PRF proposal, 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 this PAM.

ABBREVIATIONS

ADB	–	Asian Development Bank
APFS	–	Audited project financial statement
FMA	–	financial management assessment
GOKP	–	Government of Khyber Pakhtunkhwa Province
PRF	–	project readiness financing
SOE	–	statement of expenditure
WAPDA	–	Water and Power Development Authority
TA	–	technical assistance

I. IMPLEMENTATION PLAN

A. Overall Implementation Plan

1. Table 1 presents the overall implementation plan for the PRF project and records key implementation, including project management activities on quarterly basis will be updated annually and submitted to ADB with updated contract and disbursement projections.

Table 1: PRF Implementation Plan

	Advance Action (2021)						PRF Year 1 (2022)												PRF Year 2 (2023)												PRF Year 3 (2024)											
	Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4		
Activities	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
A. Implementation																																									
Package 1: detailed design																																									
Advertisement																																									
Consultant Selection																																									
Contract award and mobilization																																									
Consultant's inception report																																									
Consultant's Surveys																																									
Consultant's concept design																																									
Consultant's interim design																																									
Consultant's draft final design																																									
Physical modeling																																									
Consultant's final design																																									
Package 2: dam safety panel																																									
Advertisement																																									
Consultant Selection																																									
Contract award																																									
Consultants' deliverables																																									
B. Management Activities																																									
PRF loan negotiations																																									
ADB approval of PRF																																									
PRF signing																																									
PRF effectiveness																																									
Submission of Semiannual report																																									
Submission of annual report																																									
Submission of APFS																																									
Estimated effectiveness date of ensuing loan																																									
Submission of PCR (if required)																																									

ADB = Asian Development Bank, APFS = audited project financial statement, PCR = project completion report, PRF = project readiness financing.
Source: Asian Development Bank estimates.

II. PROJECT MANAGEMENT ARRANGEMENTS

A. Project Implementation Organizations: Roles and Responsibilities

Table 2: Roles and Responsibilities of Key Stakeholders

PRF Project Implementation Organizations	Management Roles and Responsibilities
A. Executing Agency Water and Power Development Authority	(i) Administer entire PRF implementation and ensure coordination with federal and provincial organizations; (ii) Ensure feasibility studies and detail engineering design are consulted with GOKP, and review and endorse the studies and design; (iii) Responsible for recruitment, contract management, and quality assurance of PRF consultants; (iv) Maintain adequate staff for PRF implementation; (v) Ensure adequate and timely provision of counterpart support funds, disbursements, advance account, accounting, and auditing; (vi) Constitute and coordinate meetings of the Project Working Committee in consultation with GOKP and relevant federal organizations. Also act as secretariat to all project management committees; (vii) Comply with the project's public disclosure requirements; (viii) Prepare and submit to ADB and GOKP periodic progress reports and project completion reports; (ix) Ensure full compliance with relevant loan and PRF covenants; and (x) Oversee preparation and implementation of LARPs, EIA, and other social safeguards studies.
B. Implementing agencies 1. Khyber Pakhtunkhwa Irrigation Department	(i) Coordinate with WAPDA and Khyber Pakhtunkhwa Agriculture Department and provide inputs to transaction TA and PRF consultants' deliverables for preparation of ensuing project; (ii) Participate in project management committee meetings; and (iii) Provide data and information, as available, to WAPDA and consultants for undertaking studies, notably integrated water resource management, river basin planning, irrigation management, and agricultural development plan.
2. Khyber Pakhtunkhwa Agriculture Department	(i) Coordinate with WAPDA and Khyber Pakhtunkhwa Irrigation Department and provide inputs to transaction TA and PRF consultants' deliverables for preparation of ensuing project; (ii) Participate in project management committee meetings; and (iii) Provide data and information, as available, to WAPDA and consultants for undertaking agriculture, command area development studies, and irrigation management and agricultural development plan.
C. Project Management Committees	(i) Project Steering Committee (PSC): Oversee, guide, and direct the overall implementation of feasibility studies, detailed engineering design, and planning for the ensuing project by meeting twice a year or as needed. PSC will be chaired by the Ministry of Water Resources, Government of Pakistan; (ii) Project Working Committee: Review the technical, economic, financial, sustainability, operation and maintenance, and other technical matters of the feasibility studies, detailed engineering design (PRF), and planning for the ensuing project. Meet and receive walk-through of PRF consultant's deliverables and recommend improvements. Each member of the committee will act as focal person. Provide advice to PSC. The project working committee will be chaired by WAPDA; and (iii) Project Coordination Committee: Coordinate for security, social and environmental safeguards, including preparation of land acquisition

PRF Project Implementation Organizations	Management Roles and Responsibilities
	and resettlement plan, gender action plan, project communication strategy for consulting stakeholders notably displaced people and beneficiary community. Provide advice to PSC. The project coordination committee will be chaired by Commissioner of Bannu District of GOKP. (*Detailed composition and terms of reference for the committees are presented in Annex 1 of PAM*)
D. Asian Development Bank	(i) Assist the executing agency, implementing agencies, the project management committees, Economic Affairs Division, and Ministry of Water Resources through provision of timely guidance for smooth implementation of the PRF following the agreements made; (ii) Process and approve withdrawal applications; (iii) Review all the documents that require ADB approval; (iv) Conduct PRF administration missions; (v) Monitor compliance with loan covenants, social, gender, and environmental safeguards, and technical and financial requirements; and (vi) Regularly post on ADB website the updated project information documents for public disclosures.
E. Ministry of Water Resources	(i) Overall project development oversight at federal ministry level and coordination with EAD, Ministry of Planning Development and Special Initiatives, and GOKP; (ii) Constitute and hold meetings of the Project Steering Committee in consultation with GOKP and relevant federal organizations;
F. GOKP	(i) Overall project development oversight at provincial government level and coordination with WAPDA, EAD, Ministry of Planning Development and Special Initiatives, and Ministry of Water Resources; and (ii) Constitute and hold meetings of the Project Coordination Committee in consultation with relevant provincial and federal organizations.

Note: WAPDA is a Semi-Autonomous Body under the administrative control of the Federal Government (Ministry of Water Resources).
ADB = Asian Development Bank, EAD = Economic Affairs Division of Government of Pakistan, EIA = environmental impact assessment, GOKP = Government of Khyber Pakhtunkhwa Province, LARP = land acquisition and resettlement plan, PAM = project administration manual, PRF = project readiness financing, PSC = project steering committee, WAPDA = Water and Power Development Authority, transaction TA = transaction technical assistance.
Sources: Asian Development Bank.

B. Key Persons Involved in Implementation

Executing Agency WAPDA	Muhammad Shafiq Bhetanni Project Director Telephone: Office: +92 928-622108 Mobile: +92 342 9371966 E-mail address: pdktdpwapda@gmail.com Office Address: Chief Engineer/Project Director, Kurram Tangi Dam Project, B-37 Defense Officers Colony, Bannu Cantt, Khyber Pakhtunkhwa, Pakistan
Implementing Agency Irrigation Department	Muhammad Tahir Orakzai Secretary

	Telephone: +92 91 9210845 E-mail address: irrigationpsh@gmail.com Office Address: Irrigation Department Civil Secretariat, Peshawar, Khyber Pakhtunkhwa, Pakistan
Agriculture Department	Muhammad Israr Secretary Telephone: +92 91 9210025 E-mail address: misrar04@gmail.com Office Address: Irrigation Department Civil Secretariat, Peshawar, Khyber Pakhtunkhwa, Pakistan
Asian Development Bank	
Environment, Natural Resources and Agriculture Division (CWER)	Yasmin Siddiqi Director Telephone No.: +63 2 8632 1902 E-mail address: ysiddiqi@adb.org
Mission Leader	Yaozhou Zhou Principal Water Resources Specialist, CWER Telephone No.: +63 2 8632 5943 E-mail address: yaozhou@adb.org
Contact at Resident Mission	Asad Ali Zafar Senior Project Officer (Water Resources), Pakistan Resident Mission Phone: +92 51 2600351 to 69, 2087300 E-mail: asadzafar@adb.org

C. Focal Persons of WAPDA, Khyber Pakhtunkhwa departments of planning and development, irrigation, and agriculture

2. The roles of the focal persons are summarized below and detailed in Annex 2 of the PAM.

(i) **WAPDA**. The focal person will communicate and liaise with all stakeholders; respond to queries; facilitate and arrange security clearance; organize and facilitate meetings; share consultants reports and consolidate comments; and support Project Director's office to work as secretariat to project management committees.

(ii) **Planning and Development Department**. The focal person will communicate and liaise with all stakeholders; respond to queries; facilitate meetings and other activities; coordinate with other provincial departments; and provide comments and feedback on consultants' reports.

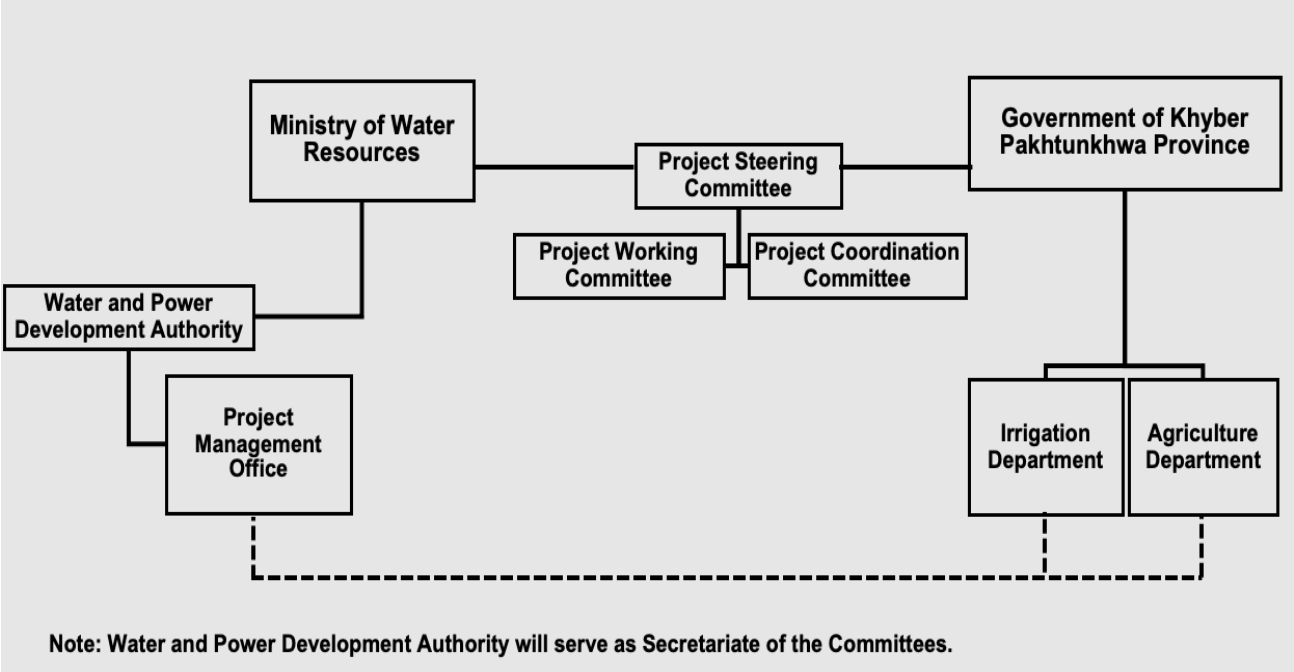
(iii) **Irrigation Department**. The focal person will communicate and liaise with all stakeholders; respond to queries; support consultants in field topographic surveys, canal alignments, design criteria, river basin and existing irrigation system data etc.; guide consultants concerning Baran Dam raising reservoir operations; review consultants' reports and provide comments and feedback.

(iv) **Agriculture Department** including directorates (research, extension, livestock and dairy engineering, On-Farm Water Management and soil conservation). The focal person will communicate and liaise with all stakeholders; respond to queries; advise consultants on the selection of crops, location and alignment of

watercourses and selection of lining and type of structures, and climate smart agriculture; facilitate meetings; review consultants' reports and provide comments and feedback.

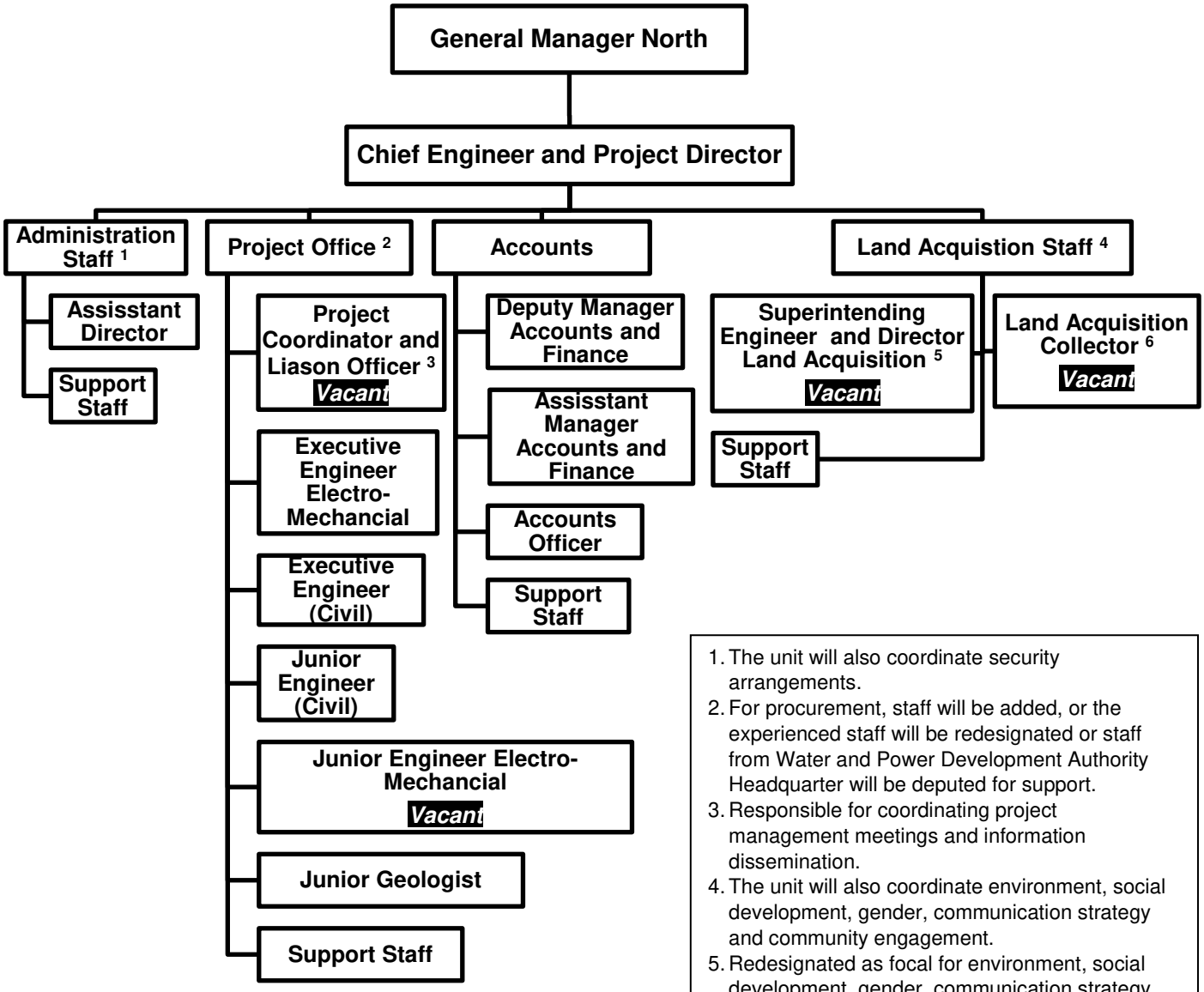
D. Project Organogram

Figure 1: Project Organogram



E. Project Organogram of Project Management Office

Figure 2: Project Management Office (Water and Power Development Authority)



1. The unit will also coordinate security arrangements.
2. For procurement, staff will be added, or the experienced staff will be redesignated or staff from Water and Power Development Authority Headquarter will be deputed for support.
3. Responsible for coordinating project management meetings and information dissemination.
4. The unit will also coordinate environment, social development, gender, communication strategy and community engagement.
5. Redesignated as focal for environment, social development, gender, communication strategy and community engagement.
6. Deputed from Government of Khyber Pakhtunkhwa Province with support staff.

III. COSTS AND FINANCING

3. The PRF is estimated to cost $7.70 million. ADB will finance consulting services cost, surveys, modeling, partial contingencies, and financial charges during implementation. The government will finance taxes and duties, security arrangements and other management costs, and contingencies.

A. Key Assumptions

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

(i) Exchange rate: PRs 154.50 = $1.00.
(ii) Price contingencies based on expected cumulative inflation over the implementation period are as follows:

Table 3: Escalation Rates for Price Contingency Calculation

Item	2022	2023	2024	Average
Foreign rate of price inflation	1.7%	1.7%	1.8%	1.7%
Domestic rate of price inflation	7.5%	7.0%	6.5%	7.0%

Source: Asian Development Bank.

(iii) In-kind contributions were calculated based on estimates provided by the executing agency and includes in-kind project management cost, if any, contributed by the executing agency and other government organizations during implementation.

B. Allocation and Withdrawal of Loan Proceeds

Table 4: Allocation and Withdrawal of Project Readiness Financing Loan Proceeds

No.	Category	Total Amount Allocated for ADB Financing ($)	Basis for Withdrawal from the Loan Account
1	Detailed engineering design	4,616,000	100% of total expenditures claimed*
2	Capacity building	155,000	100% of total expenditures claimed*
3	Financial charges during implementation	77,000	100% of amounts due
4	Unallocated	152,000	
	Total	**5,000,000**	

* Exclusive of taxes and duties imposed within the territory of the Borrower.
ADB = Asian Development Bank.
Source: Asian Development Bank estimates.

C. Detailed Cost Estimates by Expenditure Category and Financier

Table 5: Detailed Cost Estimates by Expenditure Category and Financier

($ million)

Item	ADB PRF Loan		Government		Total Cost	
	Amount	% of Cost Category	Amount	% of Cost Category	Amount	Taxes and Duties
A. Detailed Engineering Design						
1. Survey, Investigations and Data Collection	1.84	100%	0.00	0%	1.84	0.00
2. Consulting Services	2.78	84%	0.53	16%	3.31	0.53
Subtotal (A)	**4.62**	90%	**0.53**	10%	**5.15**	**0.53**
B. Capacity Building						
1. Hydraulic Model, Environmental and Social Studies	0.16	100%	0.00	0%	0.16	0.00
2. Security Arrangements and Management Costs	0.00	0%	1.19	100%	1.19	0.00
Subtotal (B)	**0.16**	12%	**1.19**	88%	**1.35**	**0.00**
Total Base Cost (A+B)	**4.77**	73%	**1.72**	27%	**6.50**	**0.53**
C. Contingencies	**0.15**	13%	**0.98**	87%	**1.13**	**0.00**
D. Financial Charges During Implementation	**0.08**	100%	**0.00**	0%	**0.08**	**0.00**
Total Project Cost (A+B+C+D)	**5.00**	65%	**2.70**	35%	**7.70**	**0.53**
% Total Project Cost		**65%**		**35%**	**100%**	

ADB = Asian Development Bank, PRF = Project Readiness Financing.
Note: Numbers may not sum precisely because of rounding.
Sources: Asian Development Bank and Water and Power Development Authority estimates.

D. Detailed Cost Estimates by Year

Table 6: Detailed Cost Estimates by Year
($ million)

Item	Total Cost	2022	2023	2024
A. Detailed Engineering Design				
1. Survey, Investigations & Data Collection	1.84	0.37	0.92	0.55
2. Consulting Services	3.31	0.66	1.66	0.99
Subtotal (A)	**5.15**	**1.03**	**2.58**	**1.55**
B. Capacity Building				
1. Hydraulic Model, Environmental and Social Studies	0.16	0.03	0.08	0.05
2. Security Arrangements and Management Costs	1.19	0.24	0.60	0.36
Subtotal (B)	**1.35**	**0.27**	**0.67**	**0.40**
Total Base Cost (A+B)	**6.50**	**1.30**	**3.25**	**1.95**
C. Contingencies	**1.13**	**0.13**	**0.55**	**0.45**
1. Physical Contingency	0.19	0.04	0.10	0.06
2. Price Contingency	0.94	0.09	0.45	0.39
D. Financial Charges During Implementation	**0.08**	**0.01**	**0.02**	**0.05**
Total Project Cost (A+B+C+D)	**7.70**	**1.44**	**3.82**	**2.44**
% Total Project Cost	**100%**	**19%**	**50%**	**32%**

Note: Numbers may not sum precisely because of rounding.
Sources: Asian Development Bank and Water and Power Development Authority estimates.

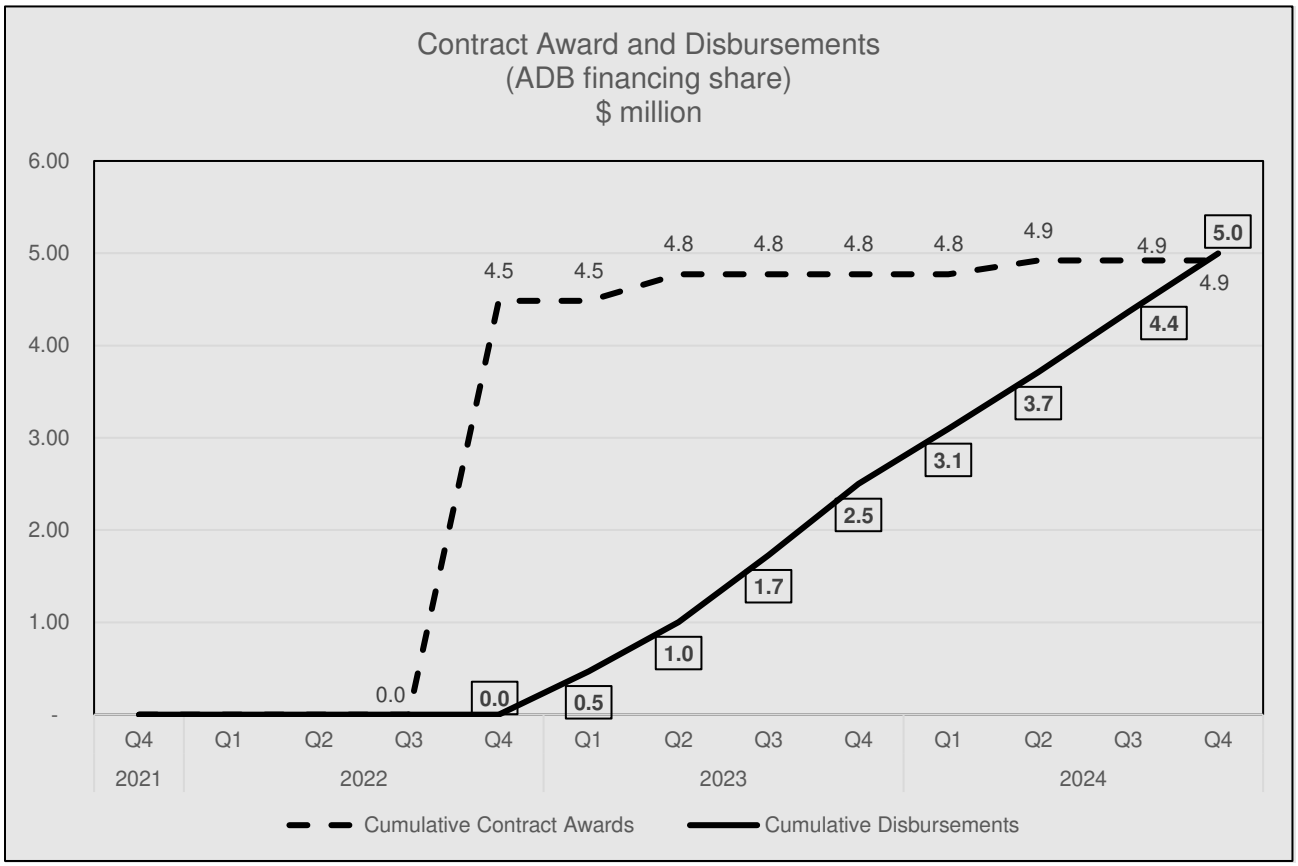
E. Contract and Disbursement S-Curve

Table 7: Contract Awards and Disbursements
($ million)

	Contract Awards					Disbursements				
	Q1	**Q2**	**Q3**	**Q4**	**Total**	**Q1**	**Q2**	**Q3**	**Q4**	**Total**
2021	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	4.49	4.49	-	-	-	0.00	0.00
2023	-	0.29	-	-	0.29	0.47	0.53	0.72	0.77	2.50
2024	-	0.15	-	-	0.15	0.60	0.62	0.65	0.64	2.50
	Total Contract Awards				**4.92**	**Total Disbursement**				**5.00**

Source: Asian Development Bank estimates.

Figure 3: Contract Awards and Disbursements S-Curve



Source: Asian Development Bank estimates.

IV. FINANCIAL MANAGEMENT

A. Financial Management Assessment

5. The financial management assessment (FMA) was conducted following Asian Development Bank (ADB) guidelines given in the Technical Guidance Notes on Financial Analysis and Evaluation[1] and Financial Management Assessment.[2] A full FMA of the executing agency and implementation agencies are being conducted by the transaction TA consultants.[3] The FMA analyzed the capacity of WAPDA as the executing and implementing agency since it will be involved in financial transactions during the PRF implementation. The FMA covered review of funds flow arrangements, staffing, accounting and financial reporting systems, financial information systems, and internal and external auditing arrangements. Based on the assessment, the key financial management risk in light of the PRF is the lack of necessary experience with ADB projects, procedures, and requirements on financial management of project office staff. The control risk at project level is moderate. However, according to the Public Expenditure and Financial Accountability report for Pakistan,[4] the inherent risk at national level is substantial because of ineffective internal audit, lack of transparency in procurement, and timeliness of reconciliations and payments.

6. In the context of the PRF and considering the nature of disbursements (consulting services cost) which would be mostly through direct payments, it was concluded that the overall pre-mitigation financial management risk of WAPDA is moderate. WADPA has adequate capacity to manage and administer advance funds and the statement of expenditure (SOE) procedures within the limits defined in Section B: Disbursement below. The financial management, internal control and risk assessment to derive the overall risk rating and the associated recommendations are given in the financial management action plan below.

Table 8: Financial Management, Internal Control and Risk Assessment

Risk	Risk rating*	Remarks/Risk Mitigation Measures
Inherent Risk		
Country-specific Risks	S	The Ministry of Water Resources, WAPDA, and GOKP shall ensure timely release of counterpart funds, as per loan covenants. WAPDA shall ensure that its annual budget for the project is allocated and made available during the fiscal year.
Entity-specific Risks	M	WAPDA has experience in implementing externally funded projects specifically large and medium-sized dams and hydropower plants including Tarbela, Dasu and Ghazi-Barotha.
Project-specific Risks	M	For financial management, training will be conducted during the PRF implementation period on ADB procedures, frequent risk reassessments and timely project progress reporting. Security in the project area may be a concern. Adequate security measures and their costs should be embedded in the project.
Overall Inherent Risk	**S**	

[1] ADB. 2019. *Financial Analysis and Evaluation: Technical Guidance Note*. Manila.
[2] ADB. 2015. *Technical Guidance Note on Financial Management Assessment.* Manila
[3] ADB. 2019. *Technical Assistance to the Islamic Republic of Pakistan for Preparing Kurram Tangi Integrated Water Resources Development Project.* Manila.
[4] World Bank. 2012. *Public Expenditure and Financial Accountability (Pakistan)*

Risk	Risk rating*	Remarks/Risk Mitigation Measures
Control Risk		
Experience of managing externally financed projects	L	WAPDA has experience of executing externally financed projects funded by the World Bank, USAID, KfW and other multi-lateral donor agencies.
Fund Flow Mechanisms	L	A rule-based mechanism for fund flow is available and governed under the rules of the Ministry of Finance. Advance Account, Reimbursement (Statement of Expenditure procedure) and Direct Payment can be suitably used by WAPDA.
Organization and Staffing	L	Staff is sufficient in number and well-qualified to manage the project. Currently there is no vacant position in the accounting department of WAPDA's project office for Kurram Tangi and all staff are deputed permanently on full-time basis.
Accounting Policies and Procedures	L	Accounting standards and practices are based on IPSAS which are in compliance with International Accounting Standards.
Payments	M	All payments are governed under the Government of Pakistan's Financial Rules and WAPDA's financial manuals. Payments are verified by the concerned department head and pre-audited.
Policies and Procedures	L	Government Financial Rules, New Accounting Manual and WAPDA Book of Financial Powers 2016 prescribe well-designed principle-based financial governance structure. The project will comply with ADB financial management requirements.
Cash and Bank	M	WAPDA will have separate bank accounts for the project that would be operated jointly with dual signatories along with up-to-date cashbooks and bank reconciliations.
Safeguard Over Assets	M	Physical verification and stock take is carried out on a periodical basis.
Internal Audit	M	WAPDA has an independent Internal Audit division which provides assurance to the Authority on a wide range of internal control related matters through review of financial and operational accounts of WAPDA formations across the country.
Information Systems	M	WAPDA's tailor-made computerized accounting ERP software and Excel-based accounting ledgers are sufficient. The software can record financial transactions, has access controls and can generate reports such as trial balances for financial reporting. Manual and guidelines to use the software are made available to the staff in addition to the mandatory training.
Overall Control Risk	**M**	
Overall (Combined) Risk	**M**	

* H = High, S = Substantial, M = Moderate, L = Low

ADB = Asian Development Bank, ERP = enterprise resource planning, GoKP = Government of Khyber Pakhtunkhwa Province, IPSAS = International Public-Sector Accounting Standards, KfW = German Development Bank, PRF = project readiness financing WAPDA = Water and Power Development Authority, USAID = United States Agency for International Development.

Table 9: Financial Management Action Plan

No.	Risk	Action	Responsibility	Target Date
1	Accounting and finance staff may be unfamiliar with ADB's financial reporting requirements.	Provide training on ADB's financial management requirements and disbursement procedures.	WAPDA and ADB	Within 3 months after PRF loan effectiveness
2	Delayed submission of APFS leading to non-compliance with ADB financial management requirements	Build awareness of ADB's mandatory requirement of preparation of project financial statements, ensuring submission of audited project financial statements within six months of fiscal year end.	WAPDA and ADB	First APFS to be submitted within 6 months after end of Fiscal Year 2021-22 (Due by 31-Dec-2022)

ADB = Asian Development Bank, APFS = audited project financial statements, PRF = project readiness financing, WAPDA = Water and Power Development Authority.

B. Disbursement

7. WAPDA will disburse the project readiness loan proceeds following ADB *Loan Disbursement Handbook* (2017, as amended from time to time), and detailed arrangements agreed between the government and ADB. Online training for project staff on disbursement policies and procedures is available.[5] Project staff are encouraged to avail of this training to help ensure efficient disbursement and fiduciary control. The types of disbursement procedures to be utilized under the PRF are direct payment, advance fund, and reimbursement procedure.

8. **Advance account**. An advance account will be established at the National Bank of Pakistan for receipt of funds from ADB. The currency of the advance account is United States dollar. The account is to be used exclusively for ADB's share of eligible expenditures. WAPDA will administer the advance account and be accountable and responsible for the proper use of the advance account. Considering WAPDA's financial management arrangements, the advance fund limit is set at the advance equivalent of 6 months' forecast or 10% of the loan amount, whichever is lower.

9. **Statement of expenditure procedure.** WAPDA may use the statement of expenditure (SOE) procedure for reimbursement of eligible expenditures.[6] The ceiling of the SOE procedure is the equivalent of $100,000 per individual payment. Supporting documents and records for expenditures claimed under the SOE should be maintained and made readily available for review by ADB's disbursement and review missions, upon ADB's request for submission of supporting documents on a sampling basis and for independent audit. Reimbursement and liquidation of individual payments in excess of the SOE ceiling should be supported by full documentation when submitting the withdrawal application to ADB.

10. Before submitting the first withdrawal application, the government should submit to ADB sufficient evidence of the authority of the person(s) who will sign the withdrawal applications on behalf of the government, together with the authenticated specimen signatures of each authorized person. The minimum value per withdrawal application is stipulated in ADB's *Loan Disbursement*

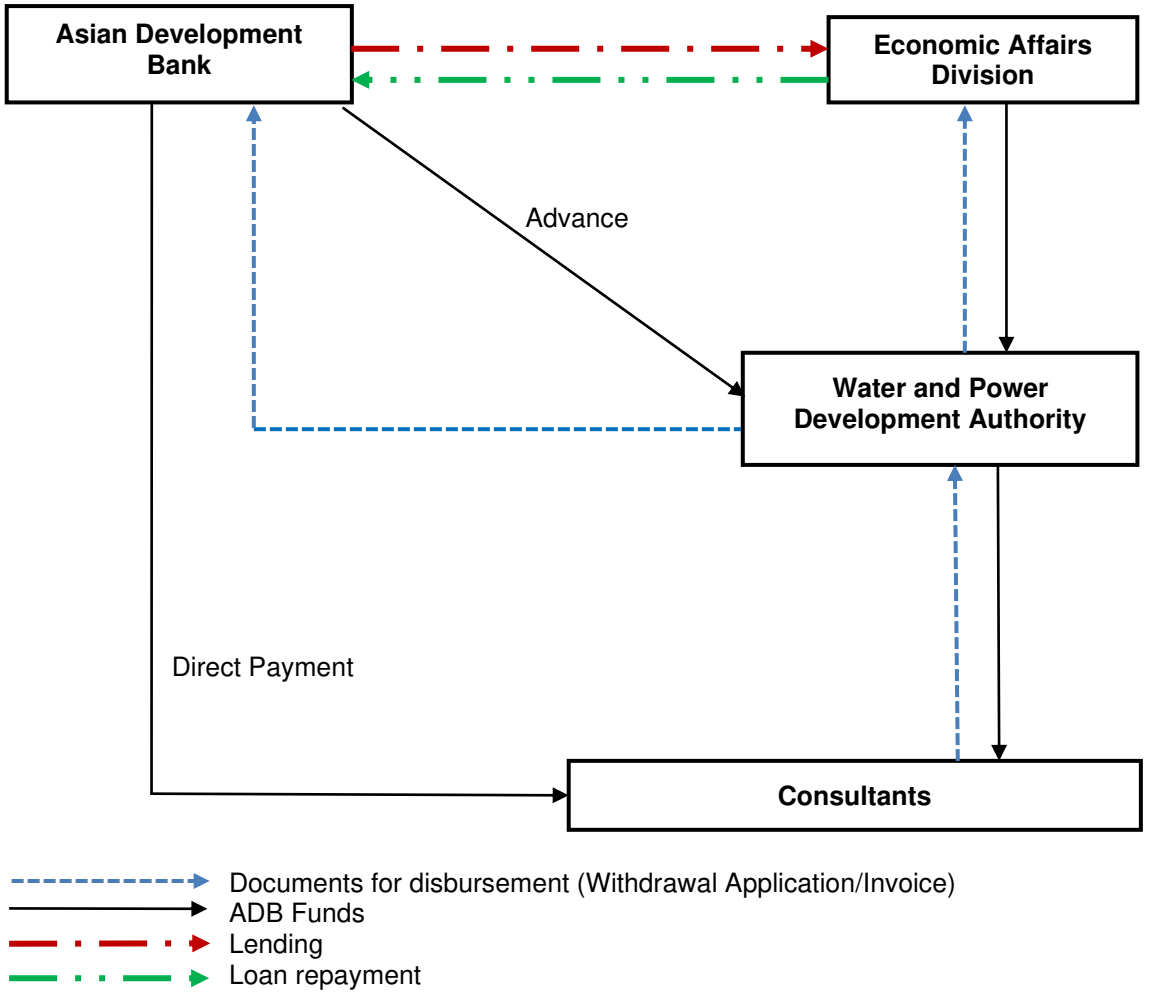
[5] Disbursement eLearning. http://wpqr4.adb.org/disbursement_elearning

[6] SOE forms are available in Appendix 7B of ADB's *Loan Disbursement Handbook* (2017, as amended from time to time).

Handbook (2017, as amended from time to time). Individual payments below such amount should be paid (i) by WAPDA and subsequently claimed from ADB through reimbursement unless otherwise accepted by ADB. The borrower should ensure sufficient category and contract balances before requesting disbursements. Use of ADB's Client Portal for Disbursements system is encouraged for submission of withdrawal applications to ADB.[7]

11. No further disbursements will be made from the PRF account upon refinancing under an ensuing or ongoing loan. The PRF loan amount and accrued financing charges are paid out under the PRF cost category of the ensuing or ongoing loan that will refinance the PRF loan. Provided the following costs are eligible expenditures, the ensuing or ongoing loan will finance (i) costs incurred under PRF that have not yet been paid from the PRF account by the refinancing date; (ii) costs for activities initiated under PRF and continuing beyond the refinancing date; and (iii) costs incurred during PRF implementation but ineligible under PRF.

Figure 4. Fund Flow Diagram



Source: Asian Development Bank.

[7] ADB's Client Portal for Disbursements system facilitates online submission of withdrawal applications to ADB, resulting in faster disbursement. The forms to be completed by the borrower are available at ADB. Guide to the Client Portal for Disbursements.

C. Accounting

12. WAPDA will maintain separate PRF project accounts and records by funding source for all expenditures incurred on the PRF project, following either cash or accrual basis of accounting. PRF project accounts will follow the International Public-Sector Accounting Standards (IPSAS) cash-based accounting or equivalent national standards.[8]

D. Auditing and Public Disclosure

13. WAPDA will cause the detailed project financial statements to be audited following the practices of the International Organization for Supreme Audit Institutions (ISSAI) or by an independent auditor acceptable to ADB.[9] WAPDA will present the audited project financial statements together with the auditor's opinion, in English, to ADB within 6 months from the end of the fiscal year.

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

15. WAPDA will monitor compliance with financial reporting and auditing requirements during review missions and normal program supervision and will follow up regularly with all concerned, including the external auditor.

16. ADB has made the government and WAPDA aware of ADB's approach to delayed submission and the requirements for satisfactory and acceptable quality of the audited project financial statements.[10] 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 its policies and procedures were followed when the share of ADB's financing was used.

17. ADB's Access to Information Policy will guide the public disclosure of the audited project financial statements, including the auditor's opinion on the project financial statements. After the

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[8] International Public-Sector Accounting Standards (IPSAS) are issued by the International Public Sector Accounting Standards Board (IPSASB).

[9] Third party audits for public sector agencies in Pakistan are generally conducted by the Auditor General of Pakistan, which is acceptable to ADB.

[10] ADB's approach and procedures regarding delayed submission of audited project financial statements:

(i) When ADB does not receive the audited project financial statements by the due date, ADB will write to the executing agency to inform it 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 ADB does not receive the audited project financial statements 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 inform the executing agency (a) of ADB's actions and (b) that the loan may be suspended if the audit documents are not received within the next 6 months.

(iii) When ADB does not receive the audited project financial statements within 12 months after the due date, ADB may suspend the loan.

review, ADB will disclose the audited project financial statements 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 its website. The management letter, additional auditor's opinions, and audited entity financial statements will not be disclosed.[11]

V. PROCUREMENT AND CONSULTING SERVICES

A. Advance Contracting and Retroactive Financing

18. **Advance contracting**. All advance contracting will be undertaken in conformity with ADB's Procurement Policy (2017, as amended from time to time) and its associated guidance notes, user's guides, and staff instructions. The issuance of consulting service recruitment notices under advance contracting will be subject to ADB approval. ADB has advised the borrower and the executing and implementing agencies that approval of advance contracting and retroactive financing does not commit ADB to finance the PRF project.

19. Advance contracting will be used for the recruitment of consulting services for detailed design and preparation of bidding documents.

20. **Retroactive financing.** Retroactive financing will not be used under the PRF.

B. Procurement of Consulting Services

21. WAPDA will recruit all consultants following ADB Procurement Policy (2017, as amended from time to time), and Procurement Regulations for ADB Borrowers (2017, as amended from time to time. Value for money shall be achieved by making use of advance contracting and open competitive bidding procedures for consultant recruitment.

22. An estimated 407 person-months of consulting services are required to conduct detailed design of dam, spillway, power houses, tunnels, intakes, irrigation canals and structures, and command area and agriculture development. This will also include support for surveys, studies, geological and hydrological investigations, climate risk and vulnerability assessment, community participation strategy, and other necessary assessments that are necessary for preparing detailed engineering design. Climate resilience measures, innovative solutions using digital technologies, modernized irrigation methods, and climate smart agriculture practices will be incorporated in the detailed design. The consultants will update the land acquisition and resettlement plan, social impact assessment, environment impact assessment, financial and economic analysis, and gender analysis and gender action plan. The consultant will prepare a procurement strategy for the ensuing project and provide procurement support to implementing agencies. The consultants will also conduct strategic procurement planning, prepare bidding documents, independently review and advise the executing agency on project preparatory work, and strengthen the institutional capacity of the executing agency. The consulting firm will be engaged using the quality- and cost-based selection method with a quality-cost ratio of 90:10. In addition, an international panel of experts on dam safety (estimated 13 person-months) will be engaged through individual consultant selection method.

[11] ADB. 2018. *Access to Information Policy*. Manila. pp. 23–24, paras. 97(iv) and/or 97(v). This type of information would generally fall under access to information policy exceptions to disclosure.

C. Procurement Plan

23. The procurement plan is prepared and given below.

Basic Data	
Project Name: PRF for Preparing Kurram Tangi Integrated Water Resources Development	
Project Number: 52051-003	Approval Number:
Country: Pakistan	Executing Agency: Water and Power Development Authority (WAPDA)
Project Procurement Classification: B	Implementing Agency: Departments of Irrigation and Agriculture of Khyber Pakhtunkhwa Province, and WAPDA
Procurement Risk: Medium	
Project Financing Amount: $7.70 million ADB Financing: $5.00 million Government Financing: $2.70 million	Loan Closing Date: 30 June 2025
Date of First Procurement Plan: 18 October 2021	Date of this Procurement Plan: 18 October 2021
Procurement Plan Duration: 18 months	Related to COVID-19 response efforts: No
Advance contracting: Yes	Use of e-Procurement (e-GP): No

a. Methods, Review and Procurement Plan

24. Except as ADB may otherwise agree, the following prior or post review requirements apply to various procurement and consultant recruitment methods used.

Procurement of Goods and Works	
Method	**Comments**
Request For Quotation for Goods	Goods such as office equipment or survey benchmarks will be included in the consulting services contract and procured by the consulting firm

Consulting Services	
Method	**Comments**
Quality- and Cost-Based Selection for Consulting Firm	Quality-Cost Ratio: 90:10 Prior review Open competitive bidding, international
Individual Consultant Selection	Prior review Advertisement in ADB consultant management system

b. List of Active Procurement Packages (Contracts)

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

Goods and Works							
Package Number	**General Description**	**Estimated Value (in $)**	**Procurement Method**	**Review**	**Bidding Procedure**	**Advertisement Date** (quarter/year)	**Comments**

Consulting Services							
Package Number	**General Description**	**Estimated Value (in $)**	**Selection Method**	**Review**	**Type of Proposal**	**Advertisement Date** (quarter/year)	**Comments**
CS-01	Detailed design, including preparation of procurement documents, safeguards documents update, and PC-I	4,494,000.00	QCBS	Prior	FTP	Q3 / 2021	Non-Consulting Services: No Type: Firm Assignment: International Quality-Cost Ratio: 90:10 Advance Contracting: Yes Covid-19 Response? No
CS-02 Dam	Dam engineering/geotechnical specialist - dam safety panel	67,500.00	ICS	Prior		Q1 / 2022	Non-Consulting Services: No Type: Individual Assignment: International Expertise: Dam engineering/ geotechnical specialist Advance Contracting: No Covid-19 Response? No
CS-02 Envi	Environmental specialist - dam safety panel	44,000.00	ICS	Prior		Q1 / 2022	Non-Consulting Services: No Type: Individual Assignment: International Expertise: Environmental specialist Advance Contracting: No Covid-19 Response? No

CS-02 Hydraulic	Hydraulic structure specialist - dam safety panel	66,000.00	ICS	Prior		Q1 / 2022	Non-Consulting Services: No Type: Individual Assignment: International Expertise: Hydraulic structure specialist Advance Contracting: No Covid-19 Response? No
CS-02 Hydro	Hydrology specialist - dam safety panel	66,000.00	ICS	Prior		Q1 / 2022	Non-Consulting Services: No Type: Individual Assignment: International Expertise: Hydrologist Advance Contracting: No Covid-19 Response? No
CS-02 Social	Social and Resettlement specialist - dam safety panel	44,000.00	ICS	Prior		Q1 / 2022	Non-Consulting Services: No Type: Individual Assignment: International Expertise: Social and resettlement specialist Advance Contracting: No Covid-19 Response? No

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

26. The following table lists goods, works, non-consulting and consulting services contracts for which procurement activity is expected to commence beyond the procurement plan duration and over the life of the project (i.e., those expected beyond the current procurement plan duration).

Goods and Works						
Package Number	**General Description**	**Estimated Value (in $)**	**Procurement Method**	**Review**	**Bidding Procedure**	**Comments**
None						

Consulting Services						
Package Number	**General Description**	**Estimated Value (in $)**	**Selection Method**	**Review**	**Type of Proposal**	**Comments**
None						

D. Consultant's Terms of Reference

27. The detailed terms of reference (TOR) for the detailed design (package CS-01) are in Annex 3 of the PAM. The TOR for the dam safety panel is in Annex 4 of the PAM.

VI. SAFEGUARDS

28. **Prohibited investment activities.** Pursuant to ADB's Safeguard Policy Statement (2009), ADB funds may not be applied to the activities described on ADB Prohibited Investment Activities List set forth in Appendix 5 of the Safeguard Policy Statement.

VII. PERFORMANCE MONITORING

A. Monitoring

29. **Project readiness financing project performance monitoring.** WAPDA will monitor PRF project performance semiannually and provide consolidated reports to ADB. These reports will include (i) each activity's progress measured against the implementation schedule, (ii) key implementation issues and solutions, (iii) an updated procurement plan, and (d) an updated implementation plan for the next 12 months. To ensure PRF projects continue to be both viable and sustainable, WAPDA will adequately review PRF project financial statements and the associated auditor's report. If an ensuing loan is not approved, WAPDA will submit a PRF project completion report to ADB within 6 months of physical completion of the PRF project.[12]

30. **Compliance monitoring.** ADB and WAPDA will monitor compliance with the covenants on policy, legal, financial, environmental, and others through semiannual and annual reports and during project administration missions, including review, midterm, and completion missions.

B. Reporting

31. WAPDA will provide ADB with:
    (i) semiannual progress reports on the PRF project in a format consistent with ADB's project performance reporting system;
    (ii) consolidated annual reports, including (a) progress achieved by output measured against the performance targets, (b) key implementation issues and solutions, (c) an updated procurement plan, and (d) an updated implementation plan for the next 12 months;[13] and
    (iii) PRF project accounts, WAPDA's audited financial statements, and the associated auditor's report.

VIII. ANTICORRUPTION POLICY

32. ADB reserves the right to investigate, directly or through its agents, any violations of the Anticorruption Policy (1998, as amended to date) relating to the PRF project following ADB's Integrity Principles and Guidelines.[14] All contracts financed by ADB will include provisions specifying ADB's right to audit and examine the records and accounts of the executing agency and all PRF project contractors, suppliers, consultants, and other service providers. This includes the examination of project outputs, assets, and all other information that may be considered relevant for audit or inspection by ADB regardless of project completion, termination, or cancellation. Firms or individuals on ADB's anticorruption debarment list are ineligible to

[12] ADB. 2018. Project Completion Report for Sovereign Operations. *Project Administration Instructions*. PAI 6.07A. Manila.
[13] The regional departments will present the performance of the completed PRF in the project completion report of the ensuing loan.
[14] ADB. 2015. *Integrity Principles and Guidelines (2015)*. Manila.

participate in activities that are financed, supported, or administered by ADB; and may not be awarded any contracts under the PRF project.[15]

33. To support these efforts, ADB included relevant provisions in the loan agreement and the bidding documents for the PRF project. The project risk assessment being prepared during the transaction TA will be reviewed and updated during the PRF implementation to highlight the governance risks. Specific mitigation measures will be implemented under the PRF and ensuing projects to mitigate these risks, as recommended by ADB's Second Governance and Anticorruption Action Plan.[16] The project consultants will put in place probity guidelines that will apply to all parties involved in the PRF project, based on ADB anticorruption guidelines and any anticorruption laws and regulations that pertain to the project.

IX. ACCOUNTABILITY MECHANISM

34. People who are, or may in the future be, adversely affected by the PRF 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 PRF project can voice and seek a resolution for 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 the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.[17]

X. RECORD OF CHANGES TO THE PROJECT ADMINISTRATION MANUAL

35. All revisions and/or updates during implementation should be retained in this Section to provide a chronological history of changes to implemented arrangements recorded in the project administration manual.

ANNEXES

Annex 1. Composition and Terms of Reference of Project Management Committees
Annex 2. Terms of Reference for Focal Persons
Annex 3. Terms of Reference for Consulting Services of Detailed Design
Annex 4. Terms of Reference for Dam Safety Panel of Experts

[15] ADB. Anticorruption and Integrity.
[16] ADB. 2006. *Second Governance and Anticorruption Action Plan (GACAP II)*. Manila; ADB. 2008. *Guidelines for Implementing ADB's Second Governance and Anticorruption Action Plan (GACAP II)*. Manila; and ADB. 2008. Sourcebook: Diagnostics to Assist Preparation of Governance Risk Assessments. Manila (draft).
[17] ADB. Accountability Mechanism.

PAM Annex 1

Project Readiness Financing: Preparing Kurram Tangi Integrated Water Resources Development Project

Draft Terms of Reference (TOR) for Project Management Committees

1. **Background:** The Ministry of Water Resources, Water and Power Development Authority (WAPDA), Government of Khyber Pakhtunkhwa (GOKP), and the Asian Development Bank (ADB) agreed to have multi-tier and multi-function project management committees for the Kurram Tangi Integrated Water Resources Development Project. This is in line with the guidance received during the approval of project PC-2 from the Central Development Working Party on 5 June 2021 recommending the inclusion of GOKP Agriculture and Irrigation departments on the project management committees for smooth implementation of the project. WAPDA will ensure the project is co-executed with these departments. The committees' draft terms of reference are presented below for government review before formal notification. Likewise, the composition of the committees is indicative and may change as required.

2. **Project Steering Committee:** The following are key terms of reference (TORs) of the committee:

a. oversee overall planning and preparatory work for the ensuing project linked with the feasibility studies and detailed engineering design implementation;
b. ensure federal and provincial coordination and inter-provincial coordination is maintained during the project preparatory work;
c. advise PC-1 formulation for the ensuing project;
d. monitor the progress and ensure adopted phased approach remains on track with the overall timeline agreed between government and ADB;
e. ensure working and coordination committees meet on regular basis and providing proceedings of their meetings to the members of the Project Steering Committee;
f. suggest solutions to issues brought for the decision of the committee and provide guidance for the overall improvement and innovation in the project;
g. meet at least twice a year or more as needed;
h. the Project Management Office, WAPDA will serve as secretariat to the committee and prepare and circulate the agenda, working paper, and minutes of the proceedings; and
i. the following composition is proposed:

- Secretary, Ministry of Water Resources of the Government of Pakistan (Chair)
- Additional Chief Secretary, GOKP Planning and Development Department (Member)
- Joint Secretary, Ministry of Water Resources (Member)
- Chief Engineering Advisor, Federal Flood Commission
- Member Water, WAPDA (Member)
- GOKP Secretaries of Irrigation, Agriculture, Local Government and Rural Development Department, Revenue and Estate Department (Members)
- Commissioner Bannu (Member)
- General Manager, North WAPDA (Member)
- Project Director WAPDA (Member and Secretary)
- *Other members or co-opted members as suggested*

3. **Project Working Committee:** The following are key TORs of the committee:

a. review the technical, economic, financial, sustainability, social and environmental safeguards, operation and maintenance, institutions, and other related matters of feasibility studies, detail engineering design and overall planning for the ensuing project;
b. attend walk-through meetings of feasibility and detailed design consultants about their deliverables and recommend improvements;
c. each member of the committee will act as focal person ensuring departmental representation to all matters considered under the purview of committee;
d. provide advice to project steering committee and share proceedings of the meetings;
e. monitor the progress and ensure adopted phased approach remains on track with the overall timelines agreed between government and ADB;
f. suggest solutions to issues brought for the decision of the committee;
g. the Project Management Office, WAPDA will serve as secretariat to the committee and prepare and circulate the agenda, working paper, and minutes of the proceedings;
h. meet at least on a quarterly basis or more as needed; and
i. Following composition is proposed:

- General Manager, North WAPDA (Chair)
- Chief Engineer South GOKP Irrigation Department (Member)
- Chief Engineer Merged Area, GOKP Irrigation Department (Member)
- Director General, GOKP Directorate On-Farm Water Management, Agriculture Department (Member)
- Director General, GOKP Directorate of Agriculture Extension, Agriculture Department (Member)
- Superintending Engineer Bannu, GOKP Irrigation Department (Member)
- Relevant District Director, GOKP Agriculture department from (i) Agriculture Extension, (ii) On-Farm Water Management, Agriculture, (iii) Livestock & Dairy Development (Members)
- Project Director, WAPDA (Member and Secretary)

Member or co-opted members

- Director General, GOKP Local Government and Rural Development, Department or their representative (member or co-opted member)
- Director General Engineering, GOKP Directorate of Agriculture Engineering, Agriculture Department or their representative (member or co-opted member)
- Director General, GOKP Soil Conservation, Agriculture Department or their representative (member or co-opted member)
- Director General, GOKP Livestock & Dairy Development, Agriculture Department or their representative (member or co-opted member)
- Superintending Engineer, Communication and Works Department, Bannu or their representative (member or co-opted member)
- Other members or co-opted members as suggested

4. **Project Coordination Committee:** The following are key TORs of the committee:

a. review and coordinate security arrangements in the project area for the officials of the government, consultants, contractors, ADB staff, and others;
b. review and coordinate social and environmental safeguards consultations and affected and beneficiary community consultation;
c. review and coordinate preparation and implementation of land acquisition and resettlement plan, gender plan, project communication strategy for consulting stakeholders;

d. facilitate provision of revenue record required for land acquisition and resettlement plan and new command area development preparation;
e. provide advice to project steering committee and share proceedings of the meetings;
f. monitor the progress and ensure adopted phased approach of the land acquisition and resettlement remains on track with the overall timelines agreed between government and ADB;
g. suggest solutions to issues brought for the decision of the committee;
h. the Project Management Office, WAPDA will serve as secretariat to the committee and prepare and circulate the agenda, working paper, and minutes of the proceedings;
i. meet at least on a quarterly basis initially and later more as needed; and
j. Following composition is proposed:

- Commissioner Bannu (Chair)
- Deputy Commissioners Bannu, Karak, Lakki Marwat and North Waziristan (Members)
- Representative of Revenue and Estate Department (Member)
- Project Director, WAPDA (Member and Secretary)
- Associated Assistant Commissioners (co-opted members)
- Representatives of the GOKP irrigation and agriculture departments (members)
- *Other members or co-opted members as needed*

PAM Annex 2

Project Readiness Financing: Preparing Kurram Tangi Integrated Water Resources Development Project

Draft Terms of Reference (TOR) for Departmental Focal Persons

The Water and Power Development Authority (WAPDA), Khyber Pakhtunkhwa (KP) Planning and Development Department (KP P&DD), Irrigation Department (KPID) and Agriculture Department (KPAD) will nominate focal persons for the project readiness financing (PRF). The focal persons will be responsible for providing inputs, liaising with the stakeholders, and reviewing consultants' deliverables during the field surveys, investigations, and detailed design. Key tasks of focal persons of each department are listed below.

1. **Water and Power Development Authority (WAPDA)**
   - i. Communicate and liaise with all stakeholders including ADB, transaction technical assistance (TRTA) and PRF consultants, KP P&DD, KPID and KPAD (Research, Extension, Livestock and on-farm water management [OFWM]);
   - ii. Respond to all queries and provide required information and feedback;
   - iii. Facilitate consultants and KP provincial departments during field visits and data collection;
   - iv. Facilitate and arrange security clearance and escort to the project area for ADB, consultants and provincial department staff during surveys and investigations (topographic, socio-economic, environmental, land acquisition and other investigations—geological and geotechnical etc.);
   - v. Organize and facilitate meetings with consultants, local government, and community concerning project activities;
   - vi. Share consultants reports with the concerned KP departments and WAPDA units concerned for technical quality, social and environmental safeguards, and procurement, and consolidate feedback/comments for sharing with consultants ensuring comments have been incorporated in the consultant's reports;
   - vii. Supervise the consultants' performance and be responsible for overall quality assurance of the consultant's reports; and
   - viii. Support the Project Director office to work as secretariat to the project steering committee, working committees, and coordination committee.

2. **Khyber Pakhtunkhwa Planning and Development Department (KP P&DD)**
   - i. Communicate and liaise with all stakeholders including WAPDA, ADB, TRTA, and PRF consultants on behalf of the provincial government;
   - ii. Respond to queries from WAPDA and consultants and provide required information and feedback;
   - iii. Facilitate WAPDA, ADB, and consultants for meetings and other activities concerning provincial government;
   - iv. Coordinate with other concerned provincial departments for integration of and consistency in approach towards project objectives and role of provincial government; and
   - v. Provide comments and feedback to consultants on reports and activities.

3. **Irrigation Department**
   - i. Communicate and liaise with all stakeholders including WAPDA, TRTA, and PRF consultants;

ii. Respond to queries from WAPDA, ADB, and consultants and provide required information and feedback;
iii. Support consultants in field activities especially topographic surveys, canal alignments, finalization of design criteria and cropping pattern and intensities, river basin and existing irrigation system data etc.;
iv. Assist and guide consultants concerning Baran Dam raising project and its association with and impact on Kurram Tangi Dam Project, especially when it comes to joint reservoir operations for irrigation supplies;
v. Facilitate and organize regular meetings with consultants in the field and with senior management for a holistic and integrated approach to the design of the system;
vi. Supervise the consultants' performance relating to irrigation system design and be responsible for quality assurance of the consultant's reports relating to irrigation system design; and
vii. Review consultants reports and provide timely comments and feedback.

4. **Agriculture Department.** The department comprises many directorates like Extension, Research, Livestock and Dairy, OFWM, Fisheries, Engineering, Soil Conservation, Bureau of Information and Crop Reporting Services. The important ones to be involved in the project more frequently include:

a. Research and Extension including Livestock and Dairy

i. Communicate and liaise with all stakeholders including WAPDA, TRTA, and PRF consultants;
ii. Respond to queries from WAPDA, ADB, and consultants and provide required information and feedback;
iii. Advise consultants on the selection of crops and cropping pattern suitable for the climate of the command area;
iv. Advise consultants on the selection of suitable high value crops—vegetables and fruits—to be introduced in the area for more economic benefits to farmers;
v. Facilitate and organize regular meetings with consultants and provide feedback during the design phase of the project;
vi. Supervise the consultants' performance relating to agriculture development and livestock and be responsible for quality assurance of the consultant's reports on these aspects; and
vii. Review consultants reports and provide timely comments and feedback.

b. On-Farm Water Management (OFWM)

i. Communicate and liaise with all stakeholders including WAPDA, TRTA, and PRF consultants;
ii. Respond to queries from WAPDA, ADB, and consultants and provide required information and feedback;
iii. Support and advise consultants in the field during surveys, location and alignment of watercourses, and selection of lining and type of structures;
iv. Advise consultants on the introduction and selection of climate smart agriculture and technologies to be introduced in the command area;
v. Review consultants reports and provide timely comments and feedback;
vi. Supervise the consultants' performance relating to command area development and on-farm water management and be responsible for quality assurance of the consultant's reports on these aspects; and

vii. Facilitate and organize regular meetings with consultants and provide feedback during the design phase of the project.

c. Agriculture Engineering

i. Communicate and liaise with all stakeholders including WAPDA, TRTA, and PRF consultants;
ii. Respond to queries from WAPDA, ADB, and consultants and provide required information and feedback;
iii. Support and advise consultants in the field during surveys, regarding areas for land leveling and for groundwater development using solar energy;
iv. Supervise the consultants' performance relating to agriculture development and be responsible for quality assurance of the consultant's reports on agriculture engineering aspect; and
v. Review consultants reports and provide timely comments and feedback.

d. Soil Conservation

i. Communicate and liaise with all stakeholders including WAPDA, TRTA, and PRF consultants;
ii. Support and advise consultants in the field during surveys, identification of locations for structures, and other interventions for controlling erosion and protection of lands;
iii. Supervise the consultants' performance relating to soil survey and agriculture development and be responsible for quality assurance of the consultant's reports on soil and agriculture aspects; and
iv. Review consultants reports and provide timely comments and feedback.

Preparing the Kurram Tangi Integrated Water Resources Development Project

Draft Terms of Reference (TOR) for
Detailed Design and Preparation of Procurement Documents, Safeguards Documents update, and PC-1

I. Background

1. The Kurram Tangi Integrated Water Resources Development Project (the ensuing project) was conceived as the second phase of Kurram Tangi Dam Project. The project concept and design were developed through a feasibility study in 2004 and an engineering design in 2011, both sponsored by the Water and Power Development Authority (WAPDA). The main project components included a 98-meter-high concrete faced rockfill dam located across the Kurram River in North Waziristan in Khyber Pakhtunkhwa Province, three hydroelectric powerhouses with combined installed capacity of 65MW, two diversion weirs, construction of Thal irrigation canal and remodeling of the existing Civil/Kankot and Marwat/Right Bank irrigation canals. Combined, these canals were envisaged to cover a total cultivable command area of 140,000 hectares, an integral component of the project.

2. The Asian Development Bank (ADB) is implementing a transaction technical assistance (TRTA) to update the project feasibility studies. The TRTA consultants will conduct environmental and social safeguard due diligence, economic and financial analysis, institutional assessment, risk assessment, and other due diligences to meet the requirements of ADB and the government to be processed as an ADB financing project. A dam safety panel of experts under the TRTA are being engaged by ADB to review the feasibility.

3. WAPDA is applying a project readiness financing (PRF) to prepare the detailed engineering design (DED) and PC-1 for the ensuing project. This will include DED of the dam and its appurtenant structures, power houses, irrigation, and command area development; procurement planning and documents preparation; preparation of PC-1; safeguard documents update; and other project readiness activities by filling the identified gaps and missing data. WAPDA is the executing agency of the PRF and will engage a consultant team for this assignment. The Irrigation Department of Government of Khyber Pakhtunkhwa (KPID) and Agriculture Department of Government of Khyber Pakhtunkhwa (KPAD) are the implementing agencies. WAPDA will be responsible for the preparatory work on dam and related works. The KPID will be responsible for all the preparatory work related to irrigation canal system. The KPAD will be responsible for preparatory work for command area and agriculture.

4. WAPDA will recruit all consultants following the ADB Procurement Policy (2017, as amended from time to time), Procurement Regulations for ADB Borrowers (2017, as amended from time to time), and its associated guidance notes, user's guide, and staff instructions. The consulting firm will be engaged using the quality- and cost-based selection method with a quality-cost ratio of 90:10, full technical proposal. The type of contract will be time-based.

II. Objective of the Assignment

5. The objective of the assignment is to (i) prepare DED and fill the gaps left in the updated feasibility study being carried out. The DED shall cover (a) all the technical aspects using international best practices for the design of high dams and hydropower plants including respective electromechanical equipment following the International Commission on Large Dams (ICOLD) guidelines; (b) design of new, upgraded, and remodeled irrigation system with improved technologies and practices in command area development; and (c) design of all

other project allied facilities. The survey and investigation data shall meet the DED requirements to calculate all the quantities with maximum accuracy as per site conditions to prepare the Bill of Quantities for the bidding documents for works contracts, FIDIC's red book or similar, and for goods contracts for equipment. ADB's Standard Bidding Documents (SBD) for Civil Works and for Goods will be used. The DED shall cover sufficient details required for the preparation of bidding drawings and technical specifications for the implementation of the project. In addition, the assignment will facilitate (i) project approval; (ii) procurement; (iii) compliances with environmental and social safeguards; and (iv) ensure project remains technically, economically, financially, institutionally relevant, viable and sustainable after the DED. Experience and lessons learned from implementation of the Phase I project and other projects of WAPDA will be drawn and incorporated in the detailed design.

III. Possible Constraints

6. The completion and magnitude of the scope of the services and overall terms of reference will depend on the extent of completion of the topographic surveys and geotechnical investigation works by the Feasibility Study (FS) consultants and the incorporation of results in the design of the dam and appurtenant structures. It is to be noted that the location of project area is in a high security risk zone, which may affect completion of the survey and investigation work within the given time frame. In the latter case, the scope of services of survey and investigations shall be subject to revision.

IV. Scope of Services and Overall Terms of Reference

7. **Overall Assignment:** The duration of services is estimated at 22 months from Q3 2022 to Q3 2024, with the major design works completed in 18 months (draft final detailed design report). The following are key scope of services while details are provided in subsequent sections.

i. Review and update the sector assessment report prepared by the FS consultants financed by the TRTA;
ii. Review topographic and geographic information system (GIS) information and maps produced during the feasibility stage and identify the gaps for the DED;
iii. Review geotechnical investigation including exploratory drilling and laboratory tests and analysis report prepared by the Feasibility Consultants and identify the requirements for further investigation and testing to be carried out for DED;
iv. Review topographic survey and investigation work carried out by the Feasibility Consultants for the irrigation canals and hydraulic structures of canals and command area development;
v. Assess which surveys should be caried out and perform topographic survey and geotechnical investigations should be carried out for the DED of the reservoir area, dam axis, seepage control measures, spillway, power houses, all other appurtenant structures, other allied project facilities, and borrow areas along with Irrigation Infrastructures and command area development;
vi. Carry out project DED using updated topographic, geotechnical, hydrological, hydraulic, sedimentation, seismic analyses based on the updated design criteria and parameters;
vii. Perform irrigation infrastructure development design in the command area according to the (a) irrigation management and agricultural development plan; (b) integrated water resource management; (c) river basin plan; and (d) reservoir simulation study and determination of dependable releases;
viii. Prepare detailed design for command area and agriculture development, including cropping patterns, water requirements, irrigation scheduling, etc;
ix. Carry out the DED of hydropower components based on capacity optimization exercise, reservoir simulation study and determination of dependable releases

according to the integrated water resource management;

x. Preparation of procurement strategy and procurement plan as part of strategic procurement planning exercise, preparation of bidding documents with detailed technical specifications, with focus on qualification and evaluation criteria including requirement if any for the consideration of life cycle costing, operation and maintenance, and use of metric point scoring system based on outcome of the strategic procurement planning, preparation of PC-1. Update Project Administration Manual as required by ADB;
xi. Review of dam break analysis and preparation of Emergency Action Plan with key measures to be taken for the population and infrastructure at risk because of inundation caused due to dam breach;
xii. Review and update the consultation and communication strategy describing the means and frequency of communication with parties both internal and external to the project;
xiii. Review and update social and environmental safeguards documents, social development and gender action plans considering culture sensitivity of tribal groups, and their compliance strategy during the implementation of the Project;
xiv. Review and update economic and financial analysis in line with DED;
xv. Update the climate risk and vulnerability assessment. Review the recommendations of FS consultants about the quantitative and qualitative assumptions about the climate change and its impact on the project design especially on structural and nonstructural interventions. DED consultants shall make their own assessment based on the data collected whether the Project is feasible under anticipated regional climatic change and if required additional analysis shall be carried out to determine the impacts on agricultural productivity;
xvi. Prepare detailed implementation plan including procurement and construction planning; and
xvii. Prepare draft power purchase agreement, document and model.

8. **Design Criteria:** The consultants shall establish the design criteria according to latest international standards and guidelines for large dams and appurtenant structures. Concerned studies and analyses results from geo-tech investigations, seismology, hydrology, sedimentation, hydraulics, seepage, and climate change impacts shall be considered. The criteria will also include the physical properties of materials for use in construction, loads on structures, admissible stresses, and standards and specifications to be used in the design. The design criteria of the irrigation system will be based on available water from Baran and Kurram Tangi Dams, proposed cropping pattern and intensity, and innovative technologies and practices for efficient use of water, optimum productivity of water and land.

9. **Drawings, bills of quantities and costs:** Prepare all civil, mechanical, and electrical drawings with pertinent details and separate bills of quantities for each structure and costs as per standard format and guidelines, and use the forms of the ADB's SBD for Works and for Goods.

10. **Preparation of tender documents:** The consultants will prepare appropriate packages of tender documents for international open competition of all components of the project with required details according to ADB guidelines for such mega projects and use of ADB's SBD for Works and for Goods.

11. **Topographic surveys and geographic information systems (GIS) mapping:** The scope of work given in the following is in addition to what has been assigned to the Feasibility

Consultants to meet the DED requirements. The following surveys will be carried out.

i. Review catchment area prepared by the FS Consultants financed by the TRTA;
ii. Review "Topographic Survey Report" carried out under the TRTA;
iii. Conduct topographic survey of reservoir on scale 1:5,000 with contour interval of 1 m. The DED consultants shall use the GIS data acquired by the TRTA Consultants and use for the confirmation where required;
iv. Conduct detailed topographic survey of reservoir area, dam site, spillway, borrow area, weirs, tunnels, power houses, saddle dam and other structures sites on scale 1:500 with contour interval of 30 cm along with digitization. (If sharp undulation exists in the topography, then it is preferred with close contour interval of 30 cm otherwise 50 cm is also acceptable. In case of borrow areas, the contour interval may be changed to 50 cm.);
v. Carry out 200 m wide strip survey for new Thal Main Canal considering different options for its recommended alignment. For distributaries 100 m wide survey and for minors 50 m wide survey is recommended, however the DED Consultants may make the adjustments in the scale of strip survey as required after the physical reconnaissance survey of the area. The scale of the topographic survey and contour interval shall be selected based on the topography of the area and design requirement;
vi. The mapping for Thal canal system Command Area in FS is done through acquisition of satellite images, rectification of images through control points and generating topography maps at 1:5,000 scale with 0.3-0.5 m interval contour (the contour interval shall be selected based on the topography and physical features of the area at DED stage). This is based on GIS/RS based and mapping and control points through field survey. This will be upgraded to preparation of detailed topographic survey of the three canals command area on 1:5,000 scale with contour interval of 1 m;
vii. Carry out 100 m wide strip survey of existing Marwat and Civil canals and their distribution system;
viii. Carry out 100 m wide strip survey for road where realignment is proposed on Bannu-Thal Road and Miran Shah-Thal Road;
ix. Conduct site surveys for other allied facilities like buildings (schools, hospital, and others);
x. Carry out 100 m wide strip survey of drinking water supply line to adjoining area and access roads along with digitization;
xi. Prepare Longitudinal profile & cross-sections / bathymetric survey of main river & nullahs/cross drainage works;
xii. Traverse and precise leveling from BMs (Benchmarks) of Survey of Pakistan for establishing permanent concrete survey monuments datum at dam site for monitoring of movement and settlement of dam body;
xiii. Review River cross-sections for dam break study;
xiv. Construct permanent concrete Survey Monuments at various locations of permanent components of the Project traversed from BMs of survey of Pakistan; and
xv. Define survey accuracy classification and quality control.

12. **Geological, geotechnical investigations and analyses:** The services will:

i. Carry out the geotechnical investigations in the reservoir area at the specified locations given in their terms of reference (TORs) and produce "Geological and Geotechnical Investigations Report";
ii. Review the available investigations data and prepare the Feasibility Level Design;
iii. Recommend the geotechnical investigations and testing for the DED after the

complete review of the existing available information from previous studies and fresh geological maps from the updated feasibility study as prescribed in their TORs;

iv. The geotechnical investigations given in the Table 2 has been proposed based on available information identified from the previous reports. The geotechnical investigation numbers, type and location shall be reviewed in the light of recommendations made by the Feasibility Consultants. However, precautions have been taken that proposed investigations for the DED shall cover all the gaps in geotechnical studies of the specific locations around the dam, appurtenant structures and all other components; and

v. Review available information from geological maps for faults, joints, stratigraphy, and other significant geological features and results from seepage analysis for assessing the need for more tests in the reservoir area. Identify and analyze potential risk of land slide, seepage and other hazards in reservoir, dam safety / monitoring / instrumentation and disaster risk assessment & management plan.

13. Table 2 summarizes the scope of investigations for DED level information.

Table 2: Geotechnical Investigations

Sr. No.	Location and Type	Requirements
1	Dam Axis	▪ Left abutments: 6 boreholes; each of 150 m depth (the number of boreholes shall be reviewed after FS. ▪ Right abutment: 8 boreholes of 50 to 100 m depth (the number of boreholes may be reduced after FS. ▪ Dam Axis: 3 boreholes; 1 of 100 m and 2 of 50 m depth
2	Saddle dam	▪ 3 to 4 boreholes each of 125 m depth
3	Spillway	▪ 2 boreholes; 01 in crest area and 01 in chute area of 100 m depth. 1 borehole of shallower depth of 50 m in the stilling basin area. However, the number depends on type of Spillway designed by the Feasibility level.
4	Power Houses & Switch yards	▪ 2 boreholes each of 30 m depth, with field and lab test required.
5	Diversion Tunnels	▪ 3 boreholes each of 30 m depth
6	Power Tunnels II	▪ 3 boreholes of 30 m depth (one each for intake portal, middle of tunnel and outlet area.
7	Power Tunnel III	▪ 3 boreholes of 30 m depth
8	Head Regulators	▪ 2 boreholes of 30 m depth
9	Canal Tunnel & Borrow Area	▪ 4 boreholes of 30 m depth
10	Irrigation system, cross drainage works on canals and command area	▪ No previous geotechnical information on the irrigation and drainage systems in the three canals command area. Required tests and investigations for detailed engineering design will be conducted based on recommendations of the updated feasibility study.
11	Grouting tests	▪ Grouting tests will be required to assess the extent and quantity for grouting in the reservoir area, the right and left abutments of main dam. Moreover, grout curtain requirement in the deepest valley needs to be checked at Feasibility Level.
12	Test Pits	▪ 36 test pits in structures & borrow areas (3m x 3m x 3m)

14. **Hydrological and Sedimentation Studies:** The adequacy and efficacy of the hydrological studies completed during FS shall be checked including the sources of data, catchment area extent, stream gauging network, instantaneous peak discharges, method, and approach to calculate probable maximum flood discharges at the dam site using an

appropriate runoff simulation model including reports on “Sedimentation Report” and “Hydrology Report”. The DED shall:

i. Check runoff simulation model based on which Probable Maximum Flood (PMF) discharges at dam site has been calculated and approve the PMF;
ii. Review an inflow design flood hydrograph for design of spillway;
iii. Validate rainfall-runoff model to estimate flood frequency and design flows/droughts to compliment the empirically derived relationships;
iv. Review the results of upstream dam breach study;
v. Validate the reservoir area capacity curve and assured water availability to determine the height of proposed dam;
vi. Review sediment study carried out at FS stage and check the approach by which sediment inflow quantity determined including the yearly influx of sediments in the reservoir;
vii. Review impact of sediments on the reservoir capacity and life of the dam;
viii. Check possibility of flushing of sediments through low level outlet;
ix. Propose sediment control measures in the catchment area;
x. Review the water balance model developed at FS to determine the impact of reservoir operation and reservoir base flow requirements to alleviate any adverse environmental, economic, and social impacts from the project; and
xi. Prepare recommendation for installing and operating a real-time sediment monitoring system.

15. **Irrigation Management and Agriculture Development Plan:** This includes review of irrigation management and agriculture development plan proposed in the FS, and infrastructural development conditions of the project’s command area and the farming communities.

16. The DED shall cover the following aspects of development plan:

i. Study of credible agricultural development scenario that the project may adopt through increased and more reliable supply of irrigation service for each of the three canal commands;
ii. Suggestions on credible cropping patterns and yields according to the agricultural development scenarios; and
iii. Proposals regarding application of water conservation technologies, change in cropping pattern, and use of seed of improved variety, and value addition of the products and better market access.

17. **Water Resource Management:** The DED shall cover the following:

i. Integrated Water Resource Management and River Basin Plan: Validation of the possible impacts of climate change on the precipitation, temperature, and associated water resources supply and demands over the expected economic life of the project. The estimated impact on the inflows and water demands in the hydrological and water resources management planning analyses should be determined. Existing as well as potential upstream development for water resource development planning on Kurram and Kaitu rivers should be analyzed;
ii. Reservoir simulation study and determination of dependable releases: Review and validation of the mathematical reservoir simulation model using the synthesized inflow data, estimated base flow requirements, integrating raised Baran Dam operations, and inter-basin water transfer from Kurram to Baran; and
iii. Reservoir operation rule: Review and validation of reservoir operation rule for

the most economic and equitable use of water resources considering water augmentation by Baran dam and dependency on diversions from Kaitu river and groundwater, along with the necessary institutional and organizational framework suitable to the prevailing institutional, political, social, and human resource conditions.

18. **Seismology:** The DED shall cover the following:

i. Review of the "Seismic Hazard Analysis Report" carried out at FS and selection of the seismic design parameters;
ii. Review of the "Dam Body 3D Structural Analysis Report" prepared under FS;
iii. Validation of seismic hazard analysis using deterministic and probabilistic analysis. Confirm the calculated values for MCE, OBE, and DBE accelerations, and validation testing with a 3D structural analysis software model; and
iv. Recommendations on Peak Ground Acceleration (PGA) values for a robust deign based on ICOLD and internationally accepted standards.

19. **Design of Dam and Allied Components:** This includes review of the topographic survey and GIS information of the reservoir area and geotechnical investigation carried out in the dam reservoir area during FS, and the review of the accuracy of the shear strength parameters selected from the available borehole data and results of samples tested in the laboratory from the previous studies carried out by WAPDA and used for the design and analysis of dam and appurtenant structures.

20. The DED shall cover but not be limited to the following:

i. Validation of the geological section developed because of boreholes to be drilled at three locations in reservoir area and results of in situ tests carried out in the boreholes. Assessment of seepage losses may occur because of permeability values obtained;
ii. Review of the surface geology along the reservoir rim to know the extent of overburden and exposed rock and make assessment of the integrity and water tightness of the reservoir rim;
iii. Review of the Project Layout Plan proposed at FS and optimization of project components at DED stage especially the "Dam Type Selection Report" and Optimization of Dam Height Report";
iv. Review of the FS of Diversion Tunnels/Power Tunnels and its geological formations and validation of carrying capacity. The lining arrangements in case of power tunnels has to be designed by DED Consultants following the standard practices;
v. Review of the dam foundation design for the control of bypass seepage and if found deficient suggest design measures to minimize the seepage and suggest measures for the monitoring after reservoir impounding;
vi. The DED Consultants shall manage and supervise the execution of the geotechnical investigation proposed in Table 2. The test results of the geotechnical investigations shall be used for the design and analysis of the dam and appurtenant structures;
vii. The Borrow area suitability for the dam construction shall be ascertained in terms of its strength parameters and quantity available in the near vicinity of the dam;
viii. In case of use of natural aggregates from River or other suitable source for concrete, DED Consultants shall check its Alkali Silica Reaction (ASR) and recommend suitable cement and use of slag or Natural Pozzolanic Materials to

reduce heat of hydration;

ix. The dam shall be designed for both static and dynamic conditions using the recommended seismic design parameters. The dam abutments investigation data shall be reviewed to ascertain type of rocks, its jointing pattern, fracturing status and in case of limestone formation its solutioning potential and possibility of seepage through the abutments. The measures shall be suggested to reduce the bypass seepage through abutments if possibility of such occurrence exists;

x. All the other structures of the Project shall be designed using the updated geotechnical investigation results and design parameters for both static and dynamic conditions;

xi. The Instrumentation sections shall be provided at two suitable locations of dam body, for the collection of data for the monitoring and evaluation of various design parameters. Seismographs shall also be proposed at suitable location for recording seismic movements;

xii. The Saddle dam design shall be updated in the light of investigations and test results obtained during DED stage following the standard design practices;

xiii. The hydraulic and structural design of Spillway shall be reviewed and validated using the updated investigation data and route the designed flood through Spillway to check the surcharge and free board requirements. The energy dissipation arrangements shall be checked through verification by physical hydraulic model studies and investigation test results carried out at DED stage shall be used for chute and stilling basin foundation design parameters;

xiv. The DED Consultants shall provide the hydraulic design of the Spillway and its related details to carry out the physical modelling at Punjab Irrigation Department Nandipur as soon as the FS design is validated preferably by end of second quarter of the DED assignment;

xv. The Spillway foundation design must be safe against the uplift pressures and required instruments proposed for the monitoring of the structures;

xvi. Perform physical hydraulic model studies to ascertain the hydraulic behavior of important structures, flow pattern and sedimentation behavior;

xvii. Review of hydropower development studies made at FS and update the design of Power Houses Complex and Power Circuit Design including conveyance tunnels or channels, intakes, headraces, penstocks, surge shafts, pressure shafts, switchyard and tailraces using the investigation test results carried out at DED stage;

xviii. Design of hydromechanical, electromechanical, electrical, auxiliary, instrumentation, telecommunication, safety installations, back-up systems, and automation systems;

xix. Perform a hydraulic transient analysis for detail design which revalidated or changed by the generation equipment supplier with the definitive characteristics of the scheme;

xx. Review transmission line design prepared under previous project and confirm or update the layout for power transmission systems connectivity to the proposed power houses under the project enabling WAPDA to send a request to the power transmission and/or generation companies; and

xxi. Design of permanent, and realigned roads, all buildings, other allied infrastructure, and facilities for social, residential and offices.

21. **Irrigation Infrastructure Design and Development:** This includes review of irrigation infrastructure design and development carried out at FS and proposed modernization of existing canal system.

22. The DED shall cover the following aspects of irrigation infrastructure design and

development in the command area:

i. Development of Thal Canal system and remodeling of Marwat and Civil Canals Irrigation System;
ii. Introduction of modernized technologies and best practices of agriculture;
iii. Water management and improvement of on-Farm water management system under the three canals; and
iv. Design of hydraulic structures like cross regulators, head regulators, irrigation outlets, cross drainage works across the canals using the investigation test results carried out at DED stage.

23. **Design of Command Area Development:** This includes review of the command area development design carried out at FS based on the surveys conducted under and irrigation management and agriculture development plan.

24. The DED shall cover the following aspects of the command area development:

i. Validation of FS prepared for development of distribution system;
ii. Command area development, using modernized approaches and technologies for improved water productivity;
iii. Consultation with communities to develop the *chakbandi*, water distribution and irrigation scheduling etc.; and
iv. Preparation of recommendations on cost sharing arrangements in consultation with beneficiaries and coordination with Agriculture Department to promote adoption of modern technologies like watercourse development, laser land levelling, pressure irrigation system etc.

25. **Climate Change Impact Evaluation:** The services shall cover the following:

i. Review and update of the "Climate Risk and Vulnerability Assessment" prepared under the FS;
ii. Determination of quantitative and qualitative assumptions about the Climate Change and its impact on the project design especially on structural and nonstructural interventions;
iii. Project feasibility assessment based on the data collected under anticipated regional climatic change and if required additional analysis shall be carried out to determine the impacts on agricultural productivity;
iv. Preparation of recommendations regarding costed mitigation and adaptation measures;
v. Assess and confirm the project is Paris Aligned including justifications, i.e. that it is consistent with pathways toward low-carbon and climate-resilient development, including:
    - GHG emission accounting;
    - GHG emission mitigation options assessment;
    - Inclusion of GHG emissions into economic analysis using shadow price of carbon;
    - Demonstration that project is resilient to range of possible futures;
    - Demonstration that project: is compatible with country development plans; Is consistent with global Paris goals; avoids lock-ins or support for emissive activities; avoids creating stranded assets; and
    - Suggest a Paris Alignment statement supported by justification.

26. **Dam Break Study:** The services shall cover the following:

i. Review of the "Dam Break Analysis Report" undertaken in the FS;
ii. Validation of the dam breach discharge hydrograph, extent and timing of the flood wave and potential impact category with inundation mapping, population, and infrastructure at risk; and
iii. Preparation of Emergency Action Plan document with key measures to be taken for the population and infrastructure at risk because of inundation caused due to dam breach.

27. **Operation and Maintenance Plan:** The services shall cover the following:

i. Provision of the outline of operation rules for the various components of the Project and determination of the inspection and maintenance plan required after the completion of the project by DED consultants;
ii. Identification of the quantum of machinery and materials required for dealing with the Emergency situation; and
iii. Assessment if project agencies will have sufficient funding to cover long-term operational expenditures as needed to ensure adequate and sustainable asset management, and identify actions to ensure project's financial sustainability n line with "Financial Analysis". The operation and maintenance (O&M) plan will be based on the future incremental costs for operation and maintenance of the project facilities.

28. **Implementation, Procurement and Construction Planning:** The services shall cover the following:

i. Review and update the "Strategic Procurement Planning, including Procurement Plan";
ii. Review and update the overall implementation schedule synchronized with activities including procurement, award of works, social safeguards plan, commencement of works, mobilization, sequencing of construction methods, water diversions, annual canal closures, preliminary configuration for equipment, plan for inspections, shipments, installation, testing and commissioning, overall testing and commissioning of powerplants, dam, and irrigation systems;
iii. Analysis and recommend planning for labour, construction machinery, and materials and recommend implementation period;
iv. Propose project implementation arrangements including institutional structure clearly defining the role of WAPDA, implementing agencies, consultants, contractors, and supervisory engineers. Layout an appropriate workflow for technical approvals, approvals for technical design, approval for changes in technical designs during construction, for effective implementation, measurements and verification of works undertaken, payment procedure, flow of funds; and
v. Set up framework for monitoring and evaluation of the project.

29. **Preparation of Draft PC-1 and Project Administration Manual (PAM):** The services shall cover the following:

i. Preparation of draft PC-1 based on the templates of the Planning

Commission of Pakistan; and
ii. Preparation of the draft PAM.

30. **Financing Strategy and Financing Plan:** The services shall cover the following:

i. Development of a financing plan for the project, considering government financing and public borrowing by the WAPDA and other loans and credits from public and private institutions and supplier etc.; and
ii. Development of an overall strategy for project financing in collaboration with WAPDA.

31. **Financial Analysis:** The services shall cover the following:

i. Review and update of the "Detailed Financial Analysis" and "Detail Cost Estimate Report" prepared under the FS including component/output-wise, investment cost, segregated by foreign exchange and local costs, with tax and duties, physical contingencies and price escalation estimating for each component/output, and the total interest and financial charges during construction, using Excel, according to ADB's financial management guidelines;
ii. Preparation of a disbursement schedule including S-curve for projections of contract awards and disbursements, and standard cost estimates tables (by expenditure category, by financier, by Output, and by Year;
iii. Undertaking of financial sustainability analysis of the project;
iv. Preparation of projections of future incremental costs for operation and maintenance of the project facilities, assess if the project agencies will have funding to cover such long-term operational expenditures as needed to ensure adequate and sustainable asset management, and identify actions to ensure project's financial sustainability; and
v. Update or conduct of additional survey data from the field.

32. **Economic Analysis:** The services shall cover the following:

i. Review and update of the "Detailed Economic Analysis" prepared under the FS;
ii. Update of the FS detailed economic analysis in accordance with ADB's Guidelines for the Economic Analysis of Projects (2017), including the risks associated with the project and undertaking a sensitivity and risk analysis;
iii. Update of the economic analysis for the individual components/sub-components estimating benefits/costs for: (i) hydropower and (ii) irrigation systems on agricultural production (farmer income) with linkages to flood damage prevention; and
iv. Update of sensitivity and switching value analysis, distribution analysis between different groups, calculating poverty impact ratio and analyzing project impact on farmers' incomes (farm budget analysis).

33. **Financial Management Systems:** The services shall cover the following:

i. Review and update of the "Financial Management System" prepared under the FS including review and update the financial management capacity of WAPDAs. Irrigation and Agriculture in terms of planning and budgeting, management and financial accounting, reporting, auditing, internal controls, and information systems in accordance with ADB's relevant requirements;
ii. Review and update of proposed disbursement and fund flow arrangements in light of executing agency and implementing agencies capacity and needs

of the ensuing project, along with disclosure arrangements for financial reporting and auditing requirements; and

iii. Review and update of financial management, internal control and risk assessment, identify any new potential project and inherent risks, and proposing mitigation measures along with timelines agreed by the executing agency and implementing agencies or where the risk is deemed high in nature, propose financial covenants to be incorporated in the ensuing loan / project agreement.

34. **Land Acquisition and Resettlement Framework/Plan (LARF/LARP):** The services shall cover the following:

i. Continuation of the land acquisition and resettlement plan process taken over from FS update by TRTA consultants and ensure applicable national/provincial laws/rules/regulations and the ADB's Safeguard Policy Statement are adhered in plan formulation and implementation;
ii. Undertake additional or new surveys for census of displaced persons, inventory of losses socio-economic information, including upstream and downstream areas and livelihood impacts and irreversible changes to lifestyles;
iii. Continuation of consultation and awareness raising campaign with the affected communities to identify their concerns;
iv. Update the LARF/LARP based on the detailed design. In particular, if the sizing of the reservoir, structure locations and canal alignments may change, undertake new consultations and surveys to update the LARF/LARP;
v. Assess and suggest if independent third-party valuation should be engaged before finalizing the LARF/LARP. If such valuation is suggested, engage independent third-party valuer to assess full replacement cost of the affected assets to ensure full replacement cost compensation;
vi. Prepare mitigation measures for adverse social impacts expected to be caused through environmental media and/or any other reasons. For this purpose, closely liaise with environment team to obtain information about expected social impacts and to jointly come up with mitigation measures for such impacts;
vii. Interact with non-governmental and community-based organizations, including the need for capacity development as identified in FS; and
viii. Assist WAPDA in the preparation and implementation of LARP and their approval from government and ADB.

35. **Environmental Assessment and Environmental Management Plan (EMP):** The services shall cover the following:

i. Continuation of the environmental safeguards preparation process taken over from FS and ensure applicable national/provincial laws/rules/regulations and the ADB's Safeguard Policy Statement are adhered in plan formulation and implementation;
ii. Update or identification of any additional potential environmental impacts during and after project implementation in around, and downstream of the project area documented in FS report;
iii. Continuation of public consultation with groups affected by the project and nongovernment organizations to obtain views that need to be incorporated in the project design and environmental mitigation measures;
iv. Update of the environmental impact assessment report based on the detailed design, describing the environment of the project area and downstream, ecological or environmental flow requirements, water usage at downstream, the anticipated environmental impacts, mitigation measures to address likely

adverse impacts, results of public consultation, and prepare an environmental management plan including institutional requirements and monitoring; The sections related with soil and geology in the EIA will need to be further strengthened after extracting relevant information from the geo-technical study, based on the geo-technical study under the PRF;

v. If the sizing of the reservoir, structure locations and canal alignments may change, undertake new consultations and surveys to update the EIA;
vi. Interact with non-governmental and community-based organizations, including the need for capacity development as identified in FS;
vii. Assist WAPDA in the preparation and implementation of the EIA and environmental management plan, and their approval from government and ADB; and finalize the EMPs for bidding documents and prepare checklist for safeguards EMPs and site-specific environment management plan (SSEMP); and
viii. Contribute to the stakeholder engagement plan to identify and carry out meaningful consultations with all the stakeholders.

36. **Social and Gender Development Plan:** The services shall cover the following:

i. Review of "Poverty and Social Analysis" prepared under FS and update the data where required on social and gender characteristics of the communities affected by the project as well as communities benefiting from the project;
ii. Review and update of the "Summary Poverty Reduction and Social Strategy";
iii. Update and/or preparation of the "Gender Action Plan" and social action plan;
iv. Continuation of consultation with vulnerable groups and women to obtain views on the need and opportunities for social and gender development;
v. Assist WAPDA in preparation and implementation of the social and gender plans;
vi. If the sizing of the reservoir, structure locations and canal alignments may change, undertake new consultations and surveys to update the LARP;
vii. Preparation of recommendations on additional social facilities and capacity development, and other measures under the plans; and
viii. Interaction with non-governmental and community-based organizations, including the need for capacity development as identified in FS.

37. **Stakeholders Communication Management:** The services shall cover the following:

i. Continuation of the work undertaken under FS for the consultation and communications as given under the "Communication and Consultation Strategy";
ii. Update of the strategy and recommend additional measures if the consultation and communication need to be made more effective or the intended results need more improvement; and
iii. Preparation of recommendations on other stakeholders like local non-government organizations or civil society to be added for delivering the results.

38. **Risk Assessment and Management Plan:** The services shall cover the following:

i. Review and update of the "Risk Assessment and Management Plan" prepared under the FS; and
ii. If required, identify additional risks, analyze, and advise WAPDA on potential risks during the design, construction, commissioning, and operational phases of the project.

V. Deliverables

39. The consulting services will be for 18 months tentatively from Q2 2022 to Q2 2024. The schedule for various reports and documents is given in Table 3.

Table 3. Schedule of deliverables

Sr.	Report	Submission Deadline
1	Inception Report	1.5 months after the Commencement of Services
2	Topographic Survey and Geotechnical Assessment Report	2.0 months after the Commencement of Services
3	Award of Geotechnical Investigation Work	2.5 months after the commencement of Services (The RFP of Consultants shall have included a list of potential geotechnical investigation firms qualified for job.)
4	Hydraulic Design of Spillway (using validated design flood and Seismic parameters)	3.5 months after the Commencement of Services
5	Consultant's Concept Design	5.0 months after the Commencement of Services
6	Design of Main Dam Report and Assessment of Reservoir geology and Rim stability.	5.0 months after the Commencement of Services
7	Finalization of Layout Plan of the Project and Supply of Data for Physical Model Testing	6.0 months after the Commencement of Services
8	Submission of Geotechnical Investigation Report	7.5 months after the Commencement of Services
9	Design Criteria	8.0 months after the Commencement of Services
10	Climate Change Impact Evaluation Report	8.0 months after the commencement of Services
11	Design of Power Houses	10.0 months after the Commencement of Services
12	Consultant's Interim Design	10.0 months after the Commencement of Services
13	Dam Break Study and Preparation of Emergency Action Plan Report	11.0 months after the Commencement of Services
14	Design of Irrigation Infrastructure and Command Area Development Report	13.0 months after the Commencement of Services
15	Submission of physical Model Testing Report and finalization of Hydraulic Design of Spillway	13.0 months after the Commencement of Services
16	Land Acquisition and Resettlement Framework/Plan, including livelihood restoration strategy	13.0 months after the Commencement of Services
17	Environmental Impact Assessment including Environmental Management Plan	13.0 months after the Commencement of Services
18	Social Impact Assessment and Social Action Plan	13.0 months after the Commencement of Services
19	Stakeholder Mapping and Engagement Plan	13.0 months after the Commencement of Services
20	Gender Development Plan	13.0 months after the Commencement of Services

Sr.	Report	Submission Deadline
21	Risk Assessment and Management Plan	14.0 months after the Commencement of Services
22	Implementation, Procurement and Construction Planning Report	14.0 months after the Commencement of Services
23	Preparation of Engineer's Estimate	15.0 months after the Commencement of Services
24	Financial Analysis	15.0 months after the Commencement of Services
25	Economic Analysis	15.0 months after the Commencement of Services
26	Bidding Documents	18.0 months after the Commencement of Services
27	Draft Final Detailed Engineering Design Report	18.0 months after the Commencement of Services
28	Final Detailed Engineering Design Report	22.0 months after the Commencement of Services
29	Preparation of PC 1 and PAM	22.0 months after the Commencement of Services

VI. Key Personnel, Qualification Requirements and Job Description

40. Table 4 provides indicative required expertise including key and non-key experts. The consulting firms will need to identify the need for technical (such as junior and assistant engineers) and administrative support staff (such as team assistant) and include their costs in the financial proposal.

Table 4 Summary of Indicative Consulting Services Requirement

S.	Area of Expertise	International (person months)	National (person months)
	Key Experts		
1	Water Resource Planning Specialist / Team Leader	10	
2	Hydraulics Specialist / Deputy Team Leader /Chief Design Engineer		18
3	Geotechnical Engineer (Dam Design Specialist)	3	3
4	Engineering Geologist	3	3
5	Hydrology and Sedimentation Specialist	2	8
6	Hydropower Specialist	2	8
7	Dam Specialist		6
8	Structure Design Specialist		8
9	Tunneling Design Specialist	2	6
10	Resettlement Specialist		12
11	Principal Seismologist / Seismic specialist	2	4
12	Principal Agronomist / CCA development expert		8
13	Principal Irrigation Engineer / Specialist	2	8
14	Financial Management Specialist	2	4
	subtotal	**28**	**96**
	Non-Key Experts		
1	Mechanical Specialist	2	8
2	Environmental Specialist	2	8
3	Construction Planning Specialist		6

S.	Area of Expertise	International (person months)	National (person months)
4	On-farm Water Management Specialist		6
5	Institutional / Governance Specialist		4
6	GIS & Remote Sensing Specialist		4
7	Biodiversity Specialist		4
8	Watershed Management Specialist		6
9	Climate Change Specialist	1	4
10	Communication Specialist		6
11	Principal Economist	2	6
12	Gender Development Specialist		6
13	Principal Contract Engineer		6
14	Principal Reports / Documentation Engineer		12
15	Senior Engineers / SQS / Costing Engineer		40
16	Jr. Engineers / Jr. Geologists / Jr. Seismologist		45
17	Jr (Economist/Sociologist/Environmentalist LA Officer) etc.		40
18	AutoCAD Operators		30
19	Resettlement Support Staff		25
	Sub-Total	**7**	**266**
	Unallocated Persons		10 [a]
	Total	**35**	**372**

Note: Key experts proposed to be named by firm and evaluated under the technical proposal.
[a] To be met from contingent budget based on increased or actual requirements.

41. **Qualification of Key Experts**. The following is a brief description of required qualification, experience and expected role for the assignment.

1) Water Resource Planning Specialist / Team Leader - International

General Qualification	Bachelor's degree, preferably post graduate degree, in Civil Engineering, water resources engineering or other relevant degrees.
Project Related Experience	At least 20 years of international work experience in design of large dams' projects. Experience in multipurpose dam including irrigation and hydropower generation will be advantageous. The applicant shall have worked as a Team Leader on at least one similar type and size of dam. Experience in externally funded projects will be given advantage.
Overseas/Country Experience	5 years of work experience on major projects in Asia is preferred. Experience in South Asia, especially in Pakistan, will be given advantage.
Job Description	1. Coordinate and manage team activities to ensure full compliance with the TOR and delivery of quality outputs in a timely manner; 2. Liaise with WAPDA, ADB, Government of Khyber Pakhtunkhwa, executing and implementing agencies, and other authorities as required;

	3. Manage field surveys, investigations, and physical and mathematical models, required for detail design; 4. Coordinate the studies related to water balance, design, and hydraulic simulations in close coordination with Hydrologist, Hydraulic Expert, Dam Design Engineers, and other team members; 5. Provide guidance in Hydrological studies, PMP, Sedimentation, and Climate change impact on the design; 6. Supervise the team to achieve the milestones proposed for the various studies and submission of documents in timely manner and establish a quality control mechanism for the technical coordination, design, and documents control; and 7. Review of PC1 and Bidding Documents.

2) Hydraulics Specialist / Deputy Team Leader /Chief Design Engineer - National

General Qualification	Minimum Bachelor's degree in Civil Engineering and Master's degree in hydraulic engineering. A degree from a recognized foreign university will be an advantage.
Project Related Experience	At least 15 - 20 years of national work experience in hydraulic structures design of large dams' projects and Irrigation infrastructure development. The applicant shall have worked as a Deputy Team Leader on at least one dam project for a period of minimum 5 years.
Experience with International Organization	3 years of work experience with ADB, the World Bank and/or other international financial institutions is preferred.
Job Description	1. Coordinate and manage team activities to ensure full compliance with the TOR and delivery of quality outputs in a timely manner; 2. Assist Team Leader in keeping Liaison with WAPDA, ADB, Government of Khyber Pakhtunkhwa, executing and implementing agencies, and other authorities as required; 3. Lead the survey and investigation works in close collaboration with Dam Specialist and Geotechnical Specialist to ensure that the survey and investigation outputs fully meet the requirement of the design criteria; 4. Carryout the hydraulic design of all major structures of the project; 5. Coordinate and guide being the Chief Engineer Design for the formulation of the Design Criteria; 6. Carryout and supervise all the hydraulic design of Irrigation infrastructures;

	7. Close coordination with the Reports and Documents Engineer on the timely issuance of all the reports; and 8. Review of Bidding Documents with special reference of estimation of quantities and bidding Drawings.

3) Geotechnical Engineer (Dam Design Specialist) - International

General Qualification	Minimum Bachelor's degree in Civil Engineering and Master's degree in geotechnical engineering.
Project Related Experience	At least 15 years of international work experience in geotechnical investigations and testing for design of large dams' projects and Irrigation infrastructure development. The applicant shall have worked as a geotechnical specialist on at least one similar type and size of dam for a period of minimum 5 years.
Overseas/Country Experience	5 years of work experience on major projects in Asia or experience in Pakistan is preferred.
Job Description	1. Lead the geotechnical investigation and analyses, in close collaboration with Water Resources Planning Specialist, Hydraulic Specialist, Design Engineer, Structures Expert and other team members as required; 2. Lead and assist in the site selection of boreholes, guide for in-situ testing and lab tests following the international standards; 3. Elaborate test reports and guide design team of concerned structures for the selection of geotechnical design parameters; 4. Prepare geotechnical report of the project; 5. Assist in establishing design criteria, standards, and specifications for structural works; and 6. Assist in the engineering design works, particularly in selecting quarries and selection of construction materials.

4) Geotechnical Engineer (Dam Design Specialist) – National

General Qualification	Minimum Bachelor's degree in Civil Engineering and Master's degree in geotechnical engineering. A degree from a recognized foreign university will be an advantage.
Project Related Experience	At least 15 years of national work experience in geotechnical investigations and testing for design of large dams' projects and Irrigation infrastructure development. The applicant shall have worked as a

	geotechnical specialist on at least one dam for a period of minimum 5 years.
Experience with International Organization	3 years of work experience with ADB, the World Bank and/or other international financial institutions is preferred.
Job Description	1. Assist in carrying out the geotechnical investigation and analyses, in close collaboration with international geotechnical expert, and other specialties of the project team; 2. Assist in the site selection of boreholes, guide for in-situ testing and lab tests following the international standards; 3. Assist in the preparation of test reports and guide design team of concerned structures for the selection of geotechnical design parameters; 4. Assist in the finalization of geotechnical report of the project; 5. Assist in establishing design criteria, standards, and specifications for structural works; and 6. Assist in the engineering design works, particularly in selecting quarries and selection of construction materials.

5) Engineering Geologist – International

General Qualification	Minimum Master's degree in engineering geology or related field.
Project Related Experience	At least 15 years of international work experience in geological investigations and testing for design of large dams' projects and Irrigation infrastructure development. The applicant shall have worked as an engineering geologist on at least one dam for a period of minimum 5 years.
Overseas/Country Experience	5 years of work experience on major projects in Asia or experience in Pakistan is preferred.
Job Description	1. Guide in carrying out the geological investigation and analyses work in the dam reservoir area; 2. Guide in the site selection of dam axis keeping in view the rock formation of the abutments; 3. Guide in the preparation of water pressure tests to be carried out in borehole in reservoir area, dam axis and other structures; 4. Finalization of geological report of the seepage potential in reservoir area and dam foundations; 5. Supervise the preparation of geological sections and surface geological mapping of the project area; 6. Guide in the engineering design works, particularly in selecting quarries and selection of construction materials; and

	7. Supervise the geological mapping of rock formations of the Tunnels in the project.

6) Engineering Geologist – National

General Qualification	Master's degree in engineering geology or related field. A degree from a recognized foreign university will be an advantage.
Project Related Experience	At least 15 years of national work experience in geological investigations and testing for design of large dams' projects and Irrigation infrastructure development. The applicant shall have worked as an engineering geologist on at least one dam for a period of minimum 5 years.
Experience with International Organization	3 years of work experience with ADB, the World Bank and/or other international financial institutions is preferred.
Job Description	1. Assist in carrying out the geological investigation and analyses work in the dam reservoir area; 2. Assist in the site selection of dam axis keeping in view the rock formation of the abutments; 3. Assist in the preparation of water pressure tests to be carried out in borehole in reservoir area, dam axis and other structures; 4. Assist in finalization of geological report of the seepage potential in reservoir area and dam foundations; 5. Assist in the preparation of geological sections and surface geological mapping of the project area; 6. Assist in the engineering design works, particularly in selecting quarries and selection of construction materials; and 7. Assist the geological mapping of rock formations of the Tunnels in the project.

7) Hydrology and Sedimentation Specialist – International

General Qualification	Bachelor's degree in Civil Engineering and Master's degree in hydrology and sedimentation engineering or related field.
Project Related Experience	At least 15 years of work experience as hydrologist in analyses and sedimentation, design, and implementation of similar projects; Demonstrated competencies in leading comprehensive hydrological and sedimentation studies for detailed design of at least three large dams and/or related water resources development projects
Overseas/Country	5 years of work experience on major projects in Asia

Experience	or experience in Pakistan is preferred.
Job Description	1. Lead the hydrological and sedimentation analyses, in close collaboration with Water Resources Planning Specialist, Water Resources/Hydraulic Specialist, Climate Change Specialist, and other team members as required; 2. Assist in the preparation of water balance study including all type of water uses at downstream and water resources management plan; 3. Assist in the engineering design works, particularly in setting the relevant climatic and hydrological design parameters; and 4. Assist in the preparation of the reservoir and irrigation system operational plan.

8) Hydrology and Sedimentation Specialist – National

General Qualification	Bachelor's degree in Civil Engineering and Master's degree in hydrology and sedimentation engineering or related field.
Project Related Experience	At least 15 years of work experience as hydrologist in analyses and sedimentation, design, and implementation of similar projects; Demonstrated competencies in carrying out comprehensive hydrological and sedimentation studies for detailed design of at least three large dams and/or related water resources development projects
Experience with International Organization	3 years of work experience with ADB, the World Bank and/or other international financial institutions is preferred.
Job Description	1. Assist in the hydrological and sedimentation analyses, in close collaboration with International hydrology and sedimentation specialist and other team members as required; 2. Prepare water balance study including all type of water uses at downstream and water resources management plan; 3. Assist in the engineering design works, particularly in setting the relevant climatic and hydrological design parameters; and 4. Assist in the preparation of the reservoir and irrigation system operational plan.

9) Hydropower Specialist – International

General Qualification	Minimum Bachelor's degree in Electrical Engineering and Master's degree in hydropower engineering or related field.
Project Related Experience	

	At least 15 years of work experience as Electrical and Hydropower Specialist in design and implementation of similar projects; Demonstrated competencies in leading detailed engineering design of at least three hydropower generation components of large dam.
Overseas/Country Experience	5 years of work experience on major projects in Asia or experience in Pakistan is preferred.
Job Description	1. Lead and assist in setting design criteria, standard of practices for hydropower system; 2. Lead engineering design works for hydropower generation plants and associated facilities and assist other engineering design works and drawings as required; 3. Lead in the preparation of the project cost estimates, including the preparation of bill of quantities and relevant specifications of the materials and construction methods; and 4. Prepare specifications for the hydropower generation components and transmission system and provide input for the preparation of bidding documents.

10) Hydropower Specialist – National

General Qualification	Bachelor's degree in Electrical Engineering, hydropower engineering or related field.
Project Related Experience	At least 15 years of work experience as Electrical and Hydropower Specialist in design and implementation of similar projects; Demonstrated competencies in detailed engineering design of at least three hydropower generation components of large dam.
Experience with International Organization	3 years of work experience with ADB, the World Bank and/or other international financial institutions is preferred.
Job Description	1. Assist in setting design criteria, standard of practices for hydropower system; 2. Carry out engineering design works for hydropower generation plants and associated facilities and assist other engineering design works and drawings as required; 3. Assist in the preparation of the project cost estimates, including the preparation of bill of quantities and relevant specifications of the materials and construction methods; and 4. Work closely with international hydropower specialist and prepare specifications for the hydropower generation components and transmission system and provide input for the preparation of bidding documents.

11) Dam Specialist – National

General Qualification	Minimum Bachelor's degree in Civil Engineering and Master's degree in geotechnical engineering. A degree from a recognized foreign university will be an advantage.
Project Related Experience:	At least 15 years of work experience in dam design and/or construction; Demonstrated competencies in leading detailed engineering design of at least two large dams in Pakistan.
Experience with International Organization	3 years of work experience with ADB, the World Bank and/or other international financial institutions is preferred.
Job Description	1. Review the FS and relevant documents related to the dam design parameters; 2. Guide and lead the design keeping in view the material and test results, for suitability, foundation, and rock suitability; 3. Confirm the dam axis location, design and type of dam selected using the available materials; 4. Carry out the stability analyses of the dam section using the computer software for various loading conditions using static and dynamic parameters; 5. Carry out the seepage analysis of the dam; 6. Carryout the dam break analysis assuming various modes of failures; 7. Prepare quantity and cost estimate for relevant part and assist in the preparation of the project cost estimates, including the preparation of bill of quantities and relevant specifications of the materials and construction methods; and 8. Assist in the preparation of the draft final report and bidding documents.

12) Structure Design Specialist – National

General Qualification	Minimum Bachelor's degree in Civil Engineering and Master's degree in structural engineering or related field. A degree from a recognized foreign university will be an advantage.
Project Related Experience	At least 15 years of work experience in structures design of similar projects and/or construction; Demonstrated competencies in leading detailed engineering design of structures in at least two large dams' projects in Pakistan.
Experience with International Organization	3 years of work experience with international organizations is preferred.
Job Description	

	1. Review the FS and relevant documents related to the dam structures design parameters; 2. Guide and lead the design keeping in view the material and test results, for suitability, foundation, and rock suitability; 3. Prepare the structural design of the Spillway for various loading conditions using designed seismic coefficient; 4. Carry out the foundation analysis of the spillway; 5. Prepare the structure design of all the hydraulic structures of the irrigation system; 6. Carry out the structure design of powerhouse and all other allied structures of the project; 7. Prepare quantity and cost estimate for relevant part and assist in the preparation of the project cost estimates, including the preparation of bill of quantities and relevant specifications of the materials and construction methods; and 8. Assist in the preparation of the draft final report and bidding documents.

13) Tunneling Design Specialist – International

General Qualification	Minimum Bachelor's degree in civil engineering or similar and Master's degree in geotechnical/rock mechanics or related field.
Project Related Experience	At least 15 years of international work experience in tunnels design for hydropower projects, Demonstrated competencies in leading detailed engineering design of tunnels in at least three large dams' projects.
Overseas/Country Experience	5 years of work experience on major projects in Asia or experience in Pakistan is preferred.
Job Description	1. Review the available feasibility, geotechnical investigation reports and relevant documents of tunnels and assist in the design; 2. Guide and lead the design keeping in view the rock type, test results for suitability, and rock stability; 3. Lead and set the design criteria for tunnels loads and stresses, size, locations, and type; 4. Lead tunnels design drawings and works and assist other engineering design works as required; 5. Prepare quantity and cost estimate for relevant part and assist in the preparation of the project cost estimates, including the preparation of bill of quantities and relevant specifications of the materials and construction methods; and 6. Lead the preparation of tunnels as part of the final report.

14) Tunneling Design Specialist – National

General Qualification	Minimum Bachelor's degree in civil engineering or geotechnical/rock mechanics or related field.
Project Related Experience	At least 15 years of international work experience in tunnels design for hydropower projects, Demonstrated competencies in detailed engineering design of tunnels in at least three large dams' projects.
Experience with International Organization	3 years of work experience with ADB, the World Bank and/or other international financial institutions is preferred.
Job Description	1. Review the available feasibility, geotechnical investigation reports and relevant documents of tunnels and assist in the design; 2. Conduct tunnel design keeping in view the rock type, test results for suitability, and rock stability; 3. Support tunnels design drawings and works and assist other engineering design works as required; and 4. Assist in preparing quantity and cost estimate for relevant part and assist in the preparation of the project cost estimates, including the preparation of bill of quantities and relevant specifications of the materials and construction methods.

15) Resettlement Specialist - National

General Qualification	Minimum Bachelor's degree in human science, social science or related field.
Project Related Experience	At least 15 years of work experience in land acquisition and resettlement planning, implementation and monitoring. Demonstrated competencies in developing and/or managing land acquisition and resettlement plan for at least three large dams, and/or large-scale water resources development projects
Experience with International Organization	3 years of work experience with ADB, the World Bank or other international financial institutions is preferred.
Job Description	1. Determine and confirm the scope of land acquisition and resettlement; classify resettlement and land acquisition losses by type; 2. Prepare census of displaced persons (DPs) and inventory of losses based on/specifying the stage of project design; 3. Propose resettlement policy specific to the project, including the DPs by types of project impacts, entitlements and eligibility;

	4. Carry out consultation with the affected communities to identify their concerns, expectations, and the willingness for and the preferred forms of participation in the formulation of land acquisition and resettlement plan; 5. Summarize FATA/KPK merger policy relevant to land acquisition, compensation, resettlement, conflict/grievance redress mechanism and propose a participatory mechanism and institutional framework for the development of land acquisition and resettlement plan, including the roles and responsibilities of the institutions and institutional personnel relevant to LARP, the entitlement matrix, relocation planning, income restoration, grievance redressing and monitoring and evaluation; 6. In consultations with DPs and key project stakeholders, propose a resettlement strategy including the resettlement options that address the needs of those requiring to be resettled with their proper livelihood restoration; 7. Prepare a land acquisition and resettlement plan (LARP) in consultation with WAPDA, GoKP, and DPs in accordance with ADB's Safeguard Policy Statement (2009); 8. Assess the current institutional capacity of WAPDA and GoKP for the updating and implementing the LARP, and identify the needs for capacity strengthening including training in safeguards management, implementation and monitoring; 9. Identify the possible need and role of non-governmental and community-based organizations, including the need for capacity development; 10. Assist in the preparation of social development plan, particularly with regard to identifying and classifying the affected communities and households; 11. Assist in the preparation of the project cost estimates, as they relate to the land acquisition and resettlement; and 12. Assist in the preparation of various reports as required.

16) Principal Seismologist / Seismic specialist – International

General Qualification	Minimum Bachelor's degree in civil engineering/geology, and Masters in Seismology, Geotechnical Engineering, Geosciences, or in related field.

Project Related Experience	At least 20 years of relevant work experience as Seismologist involved in analyzing, designing and implementation of dam projects; Demonstrated competencies in leading seismic studies for detailed design of at least three large dams and/or related water resources development projects.
Overseas/Country Experience	5 years of work experience on major projects in Asia or experience in Pakistan is preferred.
Job Description	1. Review the "Seismic Hazard Analysis Report" carried out at FS and selection of the seismic design parameters; 2. Review the "Dam Body 3D Structural Analysis Report" prepared under FS; 3. Validate seismic hazard analysis using deterministic and probabilistic analysis. Confirm the calculated values for MCE, OBE, and DBE accelerations, and validation testing with a 3D structural analysis software model; and 4. Recommend Peak Ground Acceleration (PGA) values for a robust deign based on International Commission on Large Dams (ICOLD) and internationally accepted standards.

17) Principal Seismologist / Seismic specialist – National

General Qualification	Bachelor's degree in civil engineering/geology, and Masters in Seismology, Geotechnical Engineering, Geosciences, or in related field.
Project Related Experience	At least 15 years of relevant work experience as Seismologist involved in analyzing, designing and implementation of dam projects; Demonstrated competencies in seismic studies for detailed design of at least three large dams and/or related water resources development projects.
Experience with International Organization	3 years of work experience with ADB, the World Bank or other international financial institutions is preferred.
Job Description	1. Review the "Seismic Hazard Analysis Report" carried out at FS and selection of the seismic design parameters; 2. Review the "Dam Body 3D Structural Analysis Report" prepared under FS; 3. Assist in validating seismic hazard analysis using deterministic and probabilistic analysis. Confirm the calculated values for MCE, OBE, and DBE accelerations, and validation testing with a 3D structural analysis software model; and 4. Assist in recommending Peak Ground Acceleration (PGA) values for a robust deign based on International Commission on Large

	Dams (ICOLD) and internationally accepted standards.

18) Principal Agronomist / CCA development expert – National

General Qualification	Minimum Master's degree in agronomy/crop sciences, or a related field from a recognized local/foreign university.
Project Related Experience	At least 15 years of work experience in agriculture development, irrigation scheduling and design and implementation of agriculture development projects; Demonstrated competencies in leading agricultural development planning for at least three large-scale irrigation development projects design.
Experience with International Organization	3 years of work experience with ADB, the World Bank and/or other international financial institutions is preferred.
Job Description	1. Assist in agriculture development plan, irrigation scheduling and canals operations; 2. Lead, in close collaboration with Irrigation Specialist, Water Resources Planning Expert, Water Resources Planning Specialist, Social Development Specialist, and others as required), the development of agricultural development, and plan, and assist in the development of irrigation management plan to ensure that it fully reflects the prevailing and potential agricultural development constraints and opportunities; 3. Review existing cropping pattern and constraints, irrigation methods, crop water requirements and opportunities to improve the cropping pattern that is socially and economically acceptable; 4. Lead and assist in the preparation of modern and innovative best practices and methods for crops in accordance with the required agricultural development support; and 5. Assist in the preparation of the draft final report.

19) Principal Irrigation Engineer / Specialist – International

General Qualification	Minimum Bachelor's degree in civil engineering, or agricultural engineering and Masters in irrigation Engineering, or in related field.
Project Related Experience	At least 20 years of work experience in irrigation design and management; Demonstrated competencies in leading detailed design of at least three large scale irrigation development projects.
Overseas/Country Experience	5 years of work experience on major projects in Asia or experience in Pakistan is preferred.

Job Description	1. Assist in the finalizing water allocation and water allowance for equitable water distribution to the irrigation system; 2. Lead engineering design works for irrigation component; 3. Lead, in close collaboration with Agricultural Specialist, Water Resources Expert, Institutional Specialist, and others as required), the development of irrigation management plan, and assist in the development of agricultural development plan to ensure that agricultural development scenario is fully consistent with the irrigation system and management designs; 4. Lead the preparation of the irrigation component cost estimates, including the preparation of bill of quantities and relevant specifications of the materials and construction methods, as well as costs of plausible institutional development for sustainable and equitable irrigation management; and 5. Assist in the preparation of the draft final report. report.

20) Principal Irrigation Engineer / Specialist – National

General Qualification	Minimum Bachelor's degree in civil engineering, or agricultural engineering and Masters in irrigation Engineering, or in related field.
Project Related Experience	At least 15 years of work experience in accounting, audit and financial management. Working experience in water and hydropower projects in Southeast and Pakistan is required.
Experience with International Organization	3 years of work experience with ADB, the World Bank and/or other international financial institutions is preferred.
Job Description	1. Assist in the finalizing water allocation and water allowance for equitable water distribution to the irrigation system; 2. Assist in engineering design works for irrigation component; 3. Assist in close collaboration with Agricultural Specialist, Water Resources Expert, Institutional Specialist, and others as required), the development of irrigation management plan, and assist in the development of agricultural development plan to ensure that agricultural development scenario is fully consistent with the irrigation system and management designs;

	4. Assist the preparation of the irrigation component cost estimates, including the preparation of bill of quantities and relevant specifications of the materials and construction methods, as well as costs of plausible institutional development for sustainable and equitable irrigation management; and 5. Assist in the preparation of the draft final report.

21) Financial Management Specialist – International

General Qualification	Graduate degree in accounting, finance, or related field. Having a recognized professional accountancy or financial qualification would be of added advantage.
Project Related Experience	15 years of relevant experience in financial and economic analysis, financial management, due diligence and risk assessment, along with demonstrated competencies in undertaking comprehensive financial analysis of at least three large dam and/or complex water resources development projects.
Overseas/Country Experience	5 years of work experience on major projects in Asia or experience in Pakistan is preferred.
Job Description	1. Lead the review and update of the financial management capacity of EA and IAs in terms of planning and budgeting, management and financial accounting, reporting, auditing, internal controls, and information systems in accordance with ADB's relevant requirements including Technical Guidance Note (TGN) for financial management assessment (2015), TGN for project financial reporting (2015), and TGN for preparation of cost estimates, and eLearn module for cost estimates preparation and presentation (2014); 2. Guide the national financial management specialist to carry out financial management, internal control and risk assessment (FMICRA), identifying potential project and inherent risks, and proposing mitigation measures along with timelines agreed by the EA and IAs or where the risk is deemed high in nature, propose financial covenants to be incorporated in the ensuing loan / project agreement; 3. Assist in Update the project cost estimates based on the detailed engineering design; 4. Prepare financial projections for the project and WAPDA as a whole; and 5. Carry out any other relevant tasks, as required by the team leader.

22) Financial Management Specialist – National

General Qualification	Bachelor's degree in accounting, finance, or related field. Having a recognized professional accountancy or financial qualification would be of added advantage.
Project Related Experience	10 years of relevant experience in financial and economic analysis, financial management, due diligence and risk assessment, along with demonstrated competencies in undertaking comprehensive financial analysis of at least three large dam and/or complex water resources development projects.
Experience with International Organization	3 years of work experience with ADB, the World Bank and/or other international financial institutions is preferred.
Job Description	1. Assist in review and update financial management capacity of EA and IAs in terms of planning and budgeting, management and financial accounting, reporting, auditing, internal controls, and information systems in accordance with ADB's relevant requirements including Technical Guidance Note (TGN) for financial management assessment (2015), TGN for project financial reporting (2015), and TGN for preparation of cost estimates, and eLearn module for cost estimates preparation and presentation (2014); 2. Carry out financial management, internal control and risk assessment (FMICRA), identifying potential project and inherent risks, and proposing mitigation measures along with timelines agreed by the EA and IAs or where the risk is deemed high in nature, propose financial covenants to be incorporated in the ensuing loan / project agreement; 3. Update the project cost estimates based on the detailed engineering design; 4. Assist in preparing financial projections for the project and WAPDA as a whole; and 5. Carry out any other relevant tasks, as required by the team leader.

42. **Qualification of Non-Key Experts**. All non-key experts will have university degree in related field and have at least 7 years of working experiences in related field of the work assignments (3 years of working experience for junior positions). For international experts, working in Pakistan or similar geographic countries will be advantage. For national experts, experience with ADB and/or the World Bank financed projects will be preferred. Firms are required to provide CVs of all non-key experts in addition to key experts. CVs of non-key expert will not be scored but considered on fail/pass criteria and considered in the overall evaluation of the proposal.

43. It is the responsibility of the consulting firms to identify junior and/or assistant engineers and supporting staff required under the assignment and included in the proposal.

Project Readiness Financing for Preparing Kurram Tangi Integrated Water Resources Development Project

Draft Terms of Reference (TOR) for Independent Dam Safety Panel of Experts

A Background

1. The Kurram Tangi Integrated Water Resources Development Project (the ensuing project) was conceived as the second phase of Kurram Tangi Dam Project.[1] The project concept and design were developed through a feasibility study in 2004 and an engineering design in 2011, both sponsored by the Water and Power Development Authority (WAPDA). Main project components included a 98-meter-high concrete faced rockfill dam located across the Kurram River in North Waziristan in Khyber Pakhtunkhwa (KP) Province, three hydroelectric powerhouses with combined installed capacity of 65MW, two diversion weirs, construction of Thal irrigation canal and remodeling of the existing Civil/Kankot and Marwat/Right Bank irrigation canals. Combined, these canals were envisaged to cover a total cultivable command area of 140,000 ha, an integral component of the project (see the sketch map below).

2. The Asian Development Bank (ADB) is implementing a transaction technical assistance (TRTA) to update the project feasibility studies. The TRTA consultants will conduct environmental and social safeguard due diligence, economic and financial analysis, institutional assessment, risk assessment, and other due diligences to meet requirements of ADB and the government to be processed as an ADB financing project. A dam safety panel of experts under the TRTA are being engaged by ADB to review the feasibility studies.

3. WAPDA is applying a project readiness financing (PRF) to prepare the detailed engineering design for the ensuing project. WAPDA is the executing agency of the PRF and will be responsible for engaging consulting services for this assignment. The Irrigation Department of Government of Khyber Pakhtunkhwa (KPID) and Agriculture Department of Government of Khyber Pakhtunkhwa (KPAD) are the implementing agencies. WAPDA will be responsible for the preparatory work on component 1 (dam and related works). The KPID will be responsible for all the preparatory work related to component 2 (irrigation canal system). The KPAD will be responsible for preparatory work for component 3 (command area and agriculture).

B Term of Reference of Independent Dam Safety Panel of Experts

4. **Objectives.** The objective of engaging independent panel of experts (POE) is to ensure safe, cost effective and technically viable dam design supported through independent review, and have comprehensive and integrated understanding of technical, environmental and social issues associated with the ensuing project. The POE will bring due diligence in following international quality standards in the studies, credibility to the design process, and ensuring level of confidence in the quality and integrity of the assessment process and findings. The POE is required to act independently from government institutions, and the executing and implementing agencies. It has to act in accordance with relevant ADB guidelines. The POE is to ensure international standards of design, risk evaluation and impact assessment are met, and to build a level of confidence amongst the international community in the quality and integrity of the assessment process and findings.

5. **Tasks**. The POE will provide high level and professional independent advice and

[1] The first stage included construction of a weir across the Kaitu river, construction of Sheratalla and Spaira Ragha irrigation canals, a feeder tunnel to augment Kurram Tangi reservoir, and two power houses with combined installed capacity of 18.9MW. The first stage project is under implementation.

guidance to support objectivity and credibility in the detailed engineering design. The POE shall collectively contribute and provide the review of dam type, structure, location, options analysis, slope stability, hydrological modelling, seepage analysis, reservoir operations, flood modelling, and water availability, spillway, geotechnical and seismic analysis, sedimentation, channels approach and tail conditions, intake structure and irrigation network, and environmental and social safeguards. Specifically, the POE has, but not limited to, the following tasks:

a. Review the project documents available, TRTA POE reports, TRTA consultants' updated feasibility study, and PRF consultants' detailed engineering reports (including detailed design at various phases-conceptual, interim, draft final, and final);
b. Review the technical aspects of the detailed engineering design, as well as hydrological, geotechnical and hydro-mechanical reports, and assess the adequacy of the overall quality of the investigation and design works;
c. Perform dam site inspection if possible, and review field investigations, survey, test results, etc., and check their adequacy;
d. Review the quality and sufficiency of geological investigations, interpretation thereof, correctness of the geological and hydrological models, engineering implications with respect to foundation designs, and stability of natural and excavated slopes, support of surface and underground excavations, and the design of temporary and permanent support systems; and assess the need for additional drilling, sampling, laboratory testing or other field exploration if any;
e. Advise on environmental policies and standards, geotechnical standards, hydrological assessment, water resource development and technical-level support for environmental remediation and litigation processes, including remediation system design and determination of regulatory applicability;
f. Review the status of conveyance system, en-route cross drainage structures and suggest measures for optimal utilization of stored water and its applicability for additional command, if possible;
g. Review the existing dam type and provide suggestive measures if necessary, for alternative option by keeping in view the alignment, topography, soil texture, foundation and side embankment to suit the site condition, spillway design and operations, etc.;
h. Review the reports and implementation plan/schedule of the dam construction work in conformity with the national and international standards, and assess the adequacy of the overall design and construction plan;
i. Review the dam safety instrumentation plan, such as piezometers, seepage measuring devices, settlement survey, slope inclinometers, and extensometers, and their adequacy and recommend possible improvements;
j. Review the proposed construction techniques, scheduling and quality control procedures, including the design, schedule and risk factors of diversion works during construction;
k. Advise on physical modelling parameters that would require confirmation at Nandipur Research Station of Pakistan;
l. Provide an independent review and guidance for the environmental and social aspects of the hydraulic infrastructures based on detailed engineering in particular updated environmental impact assessment and resettlement plan including environmental and social management plans developed by PRF consultants and WAPDA; and make proposals to strengthen the environmental and social monitoring, if needed. The POE should be able to review the project components from various disciplines' perspectives in an integrated manner;
m. Provide general/broad guidance on the treatment of environmental and social issues associated with the project, providing advice to relevant stakeholders including the development partners on project compliance with environmental and

social directives and recommending remedial action;

n. Review the emergency preparedness plan and recommend possible improvements;
o. Review the overall dam safety conditions of the dam and its long-term impacts on the structural integrity and operation of the dam; and
p. Review and evaluate the organization, procedures, and program to carry out long term independent monitoring of the dam safety status including the inspection frequencies, instrumentation records system, project data files, evaluation criteria and means to provide remedial actions.

C. POE Composition

6. The POE will comprise a technical subpanel, and environmental and social subpanel. The technical subpanel will provide an independent and high-level engineering evaluation of projects as it relates to dam safety; and environmental and social panel is to advise on all aspects of the project relating to environmental and social issues. The two subpanels will work in coordination with each other recognizing the importance and close relationship between technical, economic, environmental, and social considerations in the feasibility, design, construction and operation of the project. It is anticipated that the members of POE will jointly participate in selected meetings and some elements of the site visits, to support a more comprehensive and integrated understanding of issues related to the project.

7. The technical subpanel will comprise three experts, namely a dam engineering/geotechnical specialist (international, 3 person-months), a hydrologist (international, 3 person-months), and a hydraulic structure specialist (international, 3 person-months). The environmental and social panel will include two experts, namely an environment specialist (international, 2 person-months) and a social and resettlement specialist (international, 2 person-months).

8. The dam engineering specialist will serve as the chairperson of the POE, supported by the other four experts. The chairperson will be responsible to coordinate the activities and communications of the panel, chair the meetings, and liaise with client and other stakeholders. The chairperson will also be responsible for preparing the minutes of the meeting and POE report in coordination with other experts.

D. Qualification Requirements

9. The **dam engineering/geotechnical specialist** is expected to have a graduate degree in civil engineering or a rated field and at least 20 years of professional experience in the development and implementation of dam projects, with ideally previous field work experience in Pakistan or similar geological conditions, and proven track record of project optimization with due consideration to environmental and social issues. Expertise shall cover all aspects of civil engineering, including field investigations, design of dam and water conveyance structures, modeling, and construction planning, knowledge of international standards and best practices by internal commission on large dams (ICOLD) etc. The expert shall have recognized competences in dam safety and be familiar with ADB and World Bank requirements on dam safety. Hands-on experience in operation and maintenance and monitoring of large dam will be considered favorably. Experience in large dam projects in developing countries, preferably in Pakistan will be an advantage.

10. The **hydrologist** is expected to have a master's degree in hydrology or a related field and at least 15 years of professional experience in hydrology related to hydropower and/or dam projects, with proven track record in dealing with river basins water resources management, dependable releases from dam, dam break analysis of and climate change adjustments. Expertise shall cover data collection (including field measurements), modeling,

establishment of flow records and water levels, flood studies, sedimentation, and reservoir impoundment. The expert shall have working knowledge of ADB and the World Bank dam safety policies. Experience working in Pakistan for large dam projects will be an advantage.

11. The **hydraulic structure specialist** is expected to have a master's degree in civil engineer or a related field at least 20 years of professional experience in the design and construction of large dams. Expertise shall cover all aspects of various structures of dam, spillway, hydropower, power houses, tunnels, diversion structures, weirs, irrigation intake and canals. Hands on experience with dam monitoring instrumentation will be evaluated favorably. The expert shall have working knowledge of ADB and the World Bank dam safety policies. Experience working in Pakistan for large dam projects will be an advantage.

12. The **environmental specialist** is expected to have a master's degree in environment or a related field and at least 20 years of experience in environmental impact assessment (EIA) including baseline studies, preparation and implementation of environmental management plans. EIA experience for large dam projects is a must. The expert shall be familiar with both ADB and government's requirements for public consultation and disclosure process. Implementing public consultation and disclosure processes. The expert shall have working knowledge of ADB and the World Bank dam safety policies. Experience working in Pakistan for large dam projects will be an advantage.

13. The **social and resettlement specialist** is expected to have a master's degree in sociology or a related field and specialized experience of at least 20 years in preparing, implementing, and monitoring land acquisition and resettlement plans including compensation, relocation, income restoration action plans, social impact analysis, baseline studies, and cost estimates. The expert shall be familiar with both ADB and government's requirements for public consultation and disclosure process, implementing public consultation, and disclosure processes. Working experience in Pakistan for large dam projects is essential. The expert shall have working knowledge of ADB and the World Bank dam safety policies.

E. Meeting Schedule, Reporting, and Implementation Arrangements

14. **Meetings.** The tentative schedule for POE services is given in Table 1 below. The duration of POE assignment will be intermittent and estimated to spread about 20 months. The POE will be maintained on an on-call basis during the detailed engineering design period to provide review and guidance to the PRF consultants and executing and implementing agencies. The POE meetings shall be attended by all members or by subpanel as appropriate. Inspection of the site by individual members should occur only under special circumstances and in such cases the member will send his report to other panel members for joint issuance of a final report by the panel.

Table 1 Schedule of Activities

S. No.	Phase	Panel of Experts			
		Mode of Interaction	Tentative Date[1]	Key Service	Deliverable
1	Review of relevant project documents, TRTA POE reports, and PRF consultants' inception report	Meeting and/or site visits if possible	Jul-Aug 2022	Inception and guidance for PRF consultants on methodology and work plan	Report 1 (Inception review report)

S. No.	Phase	Panel of Experts			
		Mode of Interaction	Tentative Date[1]	Key Service	Deliverable
2	Review of the PRF consultants conceptual design	Meeting and/or site visits if possible	Jan 2023	Comments and guidance on conceptual design	Report 2 (conceptual design review report)
3	Review of PRF consultants interim design including various special reports	Meeting and/or site visits if possible	Jun 2023	Review and guidance on interim design	Report 3 (interim review report)
4	Review of PRF consultants draft final design including various special reports	Meeting and/or site visits if possible	Sept 2023	Review and guidance on finalization of detailed design	Report 4 (draft final review report)
5	Review of PRF consultants final design including various special reports	Meeting	Apr 2024	Final review and guidance on construction work and operations	Report 5 (final review report)

[1] The dates will be adjusted in accordance with the progress of the detailed design.

15. **Reporting**. After completing review of the documents, meeting and carrying out field inspections, if situation permits for field visits including security arrangements and "no objection" from the government, the POE members will provide their individual review findings and comments, discuss their findings and conclusions, and provide a consolidated draft reports which will present the list of experts, reference material provided, topics reviewed, the analyses carried out, the key reasons of concern, requests for additional information and analysis, the conclusion and recommendations for risk management, potential mitigation measures and solutions and approaches for corrective measures, and actions to be taken by client and consultants. Five reports as indicated in Table 1 above are required.

16. The POE reports will be reviewed by the client (WAPDA and KP departments concerned), PRF consultants and ADB; and the responses will be provided within one month. After receiving the responses, the POE will produce the final reports signed by all members of the panel. The POE shall document the results of each of their meetings and the overall conclusions and recommendations following the field inspections and their deliberations. The reports on the meetings shall be prepared, signed by all members and presented to the client's representative and PRF consultants within five working days.

17. **POE Recruitment and Supervision.** WAPDA will recruit the POE members in according with ADB Procurement Policy (2017, as amended from time to time) and associated instructions. ADB's individual consultant's selection method will be used for recruitment of the panel members.

18. Counterpart support including logistic support, security, access to documents, information and arrangements of meeting will be provided by WAPDA and KP government departments concerned.