

Project Administration Manual

Project Number: 48098-002

Loan and Grant Number(s): {LXXXX; GXXXX; TXXXX}

August 2018

Pakistan: Balochistan Water Resources Development Sector Project

CURRENCY EQUIVALENTS

(as of 17 July 2018)

Currency unit	–	Pakistan rupee (PRe)
PRe1.00	=	\$0.0080
\$1.00	=	PRs125.00

ABBREVIATIONS

ACD	–	Agriculture and Cooperatives Department
ADB	–	Asian Development Bank
BID	–	Balochistan Irrigation Department
EIA	–	environmental impact assessment
EMP	–	environmental management plan
GOB	–	Government of Balochistan
ha	–	hectare
IEE	–	initial environmental examination
JFPR	–	Japan Fund for Poverty Reduction
m ³	–	cubic meter
m ³ /s	–	cubic meter per second
LARP	–	land acquisition and resettlement plan
O&M	–	operation and maintenance
PAM	–	project administration manual
PIO	–	project implementation office
PMO	–	project management office
PPMS	–	project performance management system
SPS	–	Safeguard Policy Statement
WUA	–	water users' association

NOTES

- (i) The fiscal year (FY) of the Government of Pakistan and its agencies ends on 30 June. "FY" before a calendar year denotes the year in which the fiscal year ends, e.g., FY2017 ends on 30 June 2017.
- (ii) In this report, "\$" refers to United States dollars.

CONTENTS

I.	PROJECT DESCRIPTION	1
II.	IMPLEMENTATION PLANS	2
	A. Project Readiness Activities	2
	B. Overall Project Implementation Plan	3
III.	PROJECT MANAGEMENT ARRANGEMENTS	5
	A. Project Implementation Organizations: Roles and Responsibilities	5
	B. Key Persons Involved in Implementation	8
	C. Project Organization Structure	9
IV.	COSTS AND FINANCING	10
	A. Cost Estimates Preparation and Revisions	10
	B. Key Assumptions	11
	C. Summary Cost Estimates	11
	D. Detailed Cost Estimates by Expenditure Category	12
	E. Allocation and Withdrawal of Loan and Grant Proceeds	13
	F. Detailed Cost Estimates by Financier	14
	G. Detailed Cost Estimates by Outputs and/or Components	15
	H. Detailed Cost Estimates by Year	16
	I. Contract Awards and Disbursement Projections	17
	J. Fund Flow Diagram	20
V.	FINANCIAL MANAGEMENT	21
	A. Financial Management Assessment	21
	B. Disbursement	21
	C. Accounting	23
	D. Auditing and Public Disclosure	23
VI.	PROCUREMENT AND CONSULTING SERVICES	24
	A. Advance Contracting and Retroactive Financing	24
	B. Procurement of Goods, Works, and Consulting Services	24
	B. Procurement Plan	26
	D. Consultant's Terms of Reference	31
VII.	SAFEGUARDS	32
VIII.	GENDER AND SOCIAL DIMENSIONS	35
IX.	PERFORMANCE MONITORING, EVALUATION, REPORTING, AND COMMUNICATION	37
	A. Project Design and Monitoring Framework	37
	B. Monitoring	40
	C. Evaluation	40
	D. Reporting	41
	E. Stakeholder Communication Strategy	41
X.	ANTICORRUPTION POLICY	41
XI.	ACCOUNTABILITY MECHANISM	41
XII.	RECORD OF CHANGES TO THE PROJECT ADMINISTRATION MANUAL	42

ANNEXES

- ANNEX 1: Subproject Selection Criteria and Approval Procedure
- ANNEX 2: Detailed Arrangements for Community Participation in Procurement
- ANNEX 3: Consultants' Terms of Reference

Project Administration Manual Purpose and Process

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

The Irrigation Department and Agriculture and Cooperatives Department (ACD) of the Government of Balochistan are wholly responsible for the implementation of ADB-financed projects, as agreed jointly between the borrower and ADB, and in accordance with the policies and procedures of the government and ADB. ADB staff is responsible for supporting implementation including compliance by the Irrigation Department and ACD of their obligations and responsibilities for project implementation in accordance with ADB's policies and procedures.

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

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

I. PROJECT DESCRIPTION

1. The proposed project will support the implementation of the integrated water resources management policy of the Government of Balochistan (GOB). The policy provides a comprehensive framework for the province to address the issues of water management and development in the context of basin approach, with water harvesting, and groundwater recharging as an integral part of watershed management. About 11 potential subprojects out of over 300 longlists in the Zhob and Mula river basins were selected for potential ADB financing based on a set of criteria such as water and land availability, economic viability, and a balanced approach to extending development support to different tribal groups. The proposed project will construct and improve irrigation land of about 16,592 hectares (ha) and benefit about 42,900 farmers in the Balochistan province. The project will use sector lending modality which will provide flexibility to reprioritize and expand interventions during the implementation. Subproject selection criteria and approval procedure is in Annex 1.

2. The project is aligned with the following impacts: farm income increased and water resources management improved in Balochistan.¹ The project will have the following outcome: agriculture productivity in the project area increased.²

3. **Output 1: Irrigation infrastructure and watershed protection constructed and/or rehabilitated.** The output will construct, upgrade, or rehabilitate (i) Siri Toi Dam with storage of 30 million m³, including a spillway and a water intake; (ii) weirs and infiltration galleries; (iii) about 276 kilometers of irrigation network, including headworks, offtakes, sluice gates, other associated structures, and livestock drinking facilities; (iv) infrastructure to reduce flood risks to irrigation canals and the command area; and (v) facilities to increase women's access to water for domestic use, such as washing pads and water collection points. It will also support watershed protection for about 4,145 ha, including through (i) the rehabilitation of trees and grasses in forests; and (ii) land and water conservation activities, such as check dams, water harvesting structures, and small storage ponds for plantation and/or groundwater recharge.

4. **Output 2: Command area established and/or improved.** This output will support the development of about 16,592 ha of command area, including 1,839 ha for *khushkaba* (rainwater harvesting) farming. It will involve the (i) construction and rehabilitation of secondary and tertiary canals; (ii) construction of lined watercourses; (iii) improvement of on-farm water management and agronomic techniques, such as land leveling and irrigation scheduling; (iv) construction of a *kacha* (desert) track and access roads; (v) construction of rainwater harvesting and storage facilities; (vi) provision of farm machinery; and (vii) provision of training on sustainable farming.

5. This output will also support the pilot testing of about 130 ha of high-value agriculture in the project area. It will involve the installation of about 160 cost-effective solar-powered drip irrigation systems, the construction of two olive oil extraction plants and two processing plants for fruits and vegetables, and the construction of at least 22 women-led small-scale income-generating agribusinesses for livestock. It will strengthen high-value farming technology and increase agricultural production by demonstrating technology on at least 130 ha in 160 high-value fruit and vegetable farms and by developing guidelines on the efficient use of water and agriculture inputs. It will also (i) develop community capacity for high-value agriculture, (ii) create awareness

¹ Government of Balochistan. 2014. *Balochistan Development Vision and Strategy*. Quetta; and Government of Balochistan. 2006. *Integrated Water Resources Management Policy Balochistan*. Quetta.

² The design and monitoring framework is in Appendix 1 of the Report and Recommendation of the President.

programs on safe drinking water practices and food nutrition for women and girls, and (iii) provide about 250 women and girls with training in kitchen gardening skills.

6. **Output 3: Institutional capacity strengthened.** This output will support the (i) provision of consulting services for detailed engineering design, construction supervision, and implementation support; (ii) provision of training for the executing and implementing agencies on project management, financial management, procurement, disbursement, gender, and social and environmental safeguards; (iii) procurement of hydrometeorological equipment to strengthen information collection and water use monitoring; and (iv) development of infrastructure for improved project management and training.

II. IMPLEMENTATION PLANS

A. Project Readiness Activities

Table 1: Project Readiness

Indicative Activities	2018											Responsibility
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Advance contracting actions												PMO/PIO
Retroactive financing actions												PMO/PIO
Establish project implementation arrangements												GOB
PDWP approval of PC-I												PDWP/GOB
CDWP approval of PC-I												CDWP
ADB management review												ADB
Loan negotiations												ADB, EAD, GOB
ADB Board consideration												ADB
Loan signing												ADB, EAD, GOB
Government legal opinion												EAD, GOB
Government budget inclusion												GOB
Loan effectiveness												ADB, EAD, GOB

ADB = Asian Development Bank, CDWP = central development working party, EAD = Economic Affairs Division, GOB = Government of Balochistan, PDWP = provincial development working party, PIO = project implementation office, PMO = project management office.

Source: Asian Development Bank.

B. Overall Project Implementation Plan

Table 2: Project Implementation Schedule

Indicative Activities	2018				2019				2020				2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
A. DESIGN AND MONITORING FRAMEWORK																								
Output 1: Irrigation Infrastructure and Watershed Protection Constructed and/or Rehabilitated																								
1.1 Prepare detailed engineering design and bidding documents																								
1.2 Complete resettlement plan update and land acquisition																								
1.3 Advertise Siri Toi Dam construction packages via ICB																								
1.4 Conduct procurement of civil works and equipment																								
1.5 Award contracts for irrigation infrastructures including dams, canals, and other structures																								
1.6 Complete civil works construction and equipment installation, including dams, canals, and other structures																								
1.7 Complete civil watershed protection measures																								
Output 2: Command Area Established and/or Improved																								
2.1 Prepare detailed engineering design and bidding documents																								
2.2 Complete resettlement plan update and land acquisition																								
2.3 Conduct procurement of civil works and equipment																								
2.4 Complete command area development or rehabilitation of farmer managed irrigation facilities																								
2.5 Complete training of farmers on efficient use of water and value-added farming																								
2.6 Complete activities relating to awareness raising on safe drinking water practices, nutritional value of food, and kitchen gardening techniques																								
2.7 Complete construction of fruits, vegetables processing and olive oil processing units																								
2.8 Establish 22 women led small agri-businesses																								
Output 3. Institutional Capacity Strengthened																								
3.1 Recruit the consultant services package for detailed design, construction supervision and implementation support, including advertising the package through advance action																								
3.2 Conduct training for ID, ACD, PMO and PIO in project management and implementation																								
3.3 Conduct training for farmers in advanced farming technologies and water management																								
3.4 Procure high technology equipment for improved water resources management																								
3.5 Recruit consulting services for the development of water resources information system supported by the TA																								

Indicative Activities	2018				2019				2020				2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
3.6 Develop the water resources information system																								
3.7 Conduct test and trial operation of water resources information system, and provide necessary training to relevant staff																								
B. MANAGEMENT ACTIVITIES																								
Carry out key activities of the gender action plan																								
Conduct monitoring activities for resettlement plan and environmental management plan																								
Recruit an independent agency for external resettlement monitoring																								
Conduct annual and midterm project reviews																								

ACD = Agriculture and Cooperatives Department, ID = Irrigation Department, PIO = project implementation office, PMO = project management office, TA = technical assistance, Q = quarter.
Source: Asian Development Bank.

III. PROJECT MANAGEMENT ARRANGEMENTS

A. Project Implementation Organizations: Roles and Responsibilities

7. The GOB, through the Irrigation Department, will be the executing agency of the project and the Agriculture and Cooperatives Department (ACD) will be the implementing agency, with active support from relevant departments (Forestry and Wild Life, and Livestock and Dairy). A project steering committee will be set up to guide and direct the project implementation. A working committee will be set up for intradepartment coordination and project operational oversight. A project management office (PMO) will be established in Quetta for overall project implementation and coordination. The PMO, led by a Project Director, will have direct responsibility for Output 1 and Output 3. A project implementation office (PIO) will be established in the ACD to implement the Output 2. For Output 1, the PMO will be supported by Deputy Director Irrigation in Zhob and Khuzdar districts, and by District Forest Officers and their staff in Zhob and Khuzdar districts (for implementation of watershed protection measures). For Output 2, the PIO will be supported by Deputy Directors on farm water management and their staff in Zhob and Khuzdar districts. Output 3 will be implemented by the PMO with support from the PIO. Table 3 provides the roles and responsibilities of each agency involved.

Table 3: Roles and Responsibilities

Project Implementation Organizations	Management Roles and Responsibilities
Irrigation Department - Executing Agency	<ul style="list-style-type: none"> - recruit project management office (PMO) staff for the project; - provide timely provision of agreed counterpart funds for the project; - conduct timely financial audit as per agreed timeframe and taking recommended actions; - comply with loan covenants (social, environmental, financial, economic, and others); - ensure the project sustainability after the implementation and reporting to Asian Development Bank (ADB) on the development impacts; and - coordinate with Department for Agriculture and Cooperatives (ACD), Department for Forest and Wild Life, and Department for Livestock and Dairy Development.
Project Management Office - project specific management body	<ul style="list-style-type: none"> - implementation of irrigation infrastructure construction and improvement, watershed rehabilitation and protection, and institutional capacity strengthening sub-components; - administer staff provided to PMO by the Departments of Forest and Wild Life, and Livestock, and Dairy Development; - recruit consultants; - review detailed design and bidding documents; - procure works and goods, and award contracts in a timely manner; - ensure that final/implementation-ready land acquisition and resettlement plans (LARPs) are approved and disclosed prior to award of civil works contracts and that civil works commence only after completion of LARP implementation has been verified by an external monitor; - follow the implementation requirements of the land acquisition and resettlement framework, including appropriate resettlement screening, assessment, and resettlement management planning for non-core subprojects;

Project Implementation Organizations	Management Roles and Responsibilities
	<ul style="list-style-type: none"> - follow the implementation requirements of the environment assessment and report framework, including appropriate environmental screening, assessment and environmental management planning for non-core subprojects; - comply with the project's public disclosure, safeguards monitoring, and grievance redress mechanism requirements; - monitor and evaluate project activities and outputs; - review consultant's reports, provide timely supervisions, and take timely decisions and actions on the project implementation; - maintain advance account properly; - ensure public disclosure of project outputs; - ensure quality assurance of works and services of consultants and counterpart staff; - establish strong financial management system including internal audit arrangement and submit withdrawal applications in a timely manner; - implementation and reporting of gender action plan (GAP); - prepare periodic progress reports and submit them to ADB; and - prepare project completion report and submit it to ADB.
Project Implementation Office (PIO) in Agriculture and Cooperatives Department – project specific implementing agency	<ul style="list-style-type: none"> - implementation of command area development, farmers managed small schemes, <i>khuskaba</i> (rainwater harvesting) farming and high value agriculture sub-components inclusive of GAP targets; - provide information and reports on above sub-components to PMO for overall project management; - procure works and goods, and award contracts in a timely manner; - monitor and evaluate project activities and outputs inclusive of GAP targets; - review consultant's reports, provide timely supervisions, and take timely decisions and actions on the project implementation in consultation with PMO; - maintain advance account properly; - provide information to PMO for public disclosure; - establish strong financial management system including internal audit arrangement and submit withdrawal applications in a timely manner; and - prepare periodic progress reports inclusive of progress on GAP targets and submit to PMO.
Project Steering Committee	<ul style="list-style-type: none"> - guide and direct overall project implementation - ensure timely review of the project implementation once a year; and - coordinate with the World Bank and ADB for timely sharing of common issues, risks and/or good practices on their financed projects in the province.
Project Working Committee	<ul style="list-style-type: none"> - ensure better intradepartmental coordination and provide overall guidance on operational issues; - conduct quarterly (or more frequently if needed) project review; and - advise Project Steering Committee.
ADB	<ul style="list-style-type: none"> - assist the executing agency, PMO, and PIO in providing timely guidance for smooth implementation of the project in accordance with the agreements made;

Project Implementation Organizations	Management Roles and Responsibilities
	<ul style="list-style-type: none"> - process and approve withdrawal applications submitted by the PMO and the PIO; - review all the documents that require ADB approval; - conduct periodic loan review missions, midterm review, and project completion mission; - monitor compliance with loan covenants, social, gender and environmental safeguards, technical and financial requirements; - ensure compliance with financial audit recommendations; - process withdrawal applications on time and release eligible funds; - regularly update the project performance review reports with assistance from the PMO; and - regularly post on ADB website the updated project information documents for public disclosures including safeguards documents as per the disclosure requirements of the ADB's Safeguards Policy Statement, 2009.

Source: Asian Development Bank.

8. **Operation and maintenance (O&M).** It was estimated that the annual incremental O&M cost in financial terms for the irrigation systems is about PRe118.87 million. The O&M cost for key infrastructure was assumed at 1% of the corresponding infrastructure cost and O&M requirement for on-farm irrigation system used PRe2,347 per ha based on the experiences in Balochistan and Pakistan. See the following tables (Tables 4 and 5).

Table 4 Operation and Maintenance Estimate for Infrastructure

No.	Name Subprojects	Infrastructure Cost (Million PRe)	O&M Cost for Infrastructure (Million PRe.)
Zhob River Basin			
1	Ahmedzai subproject	182.53	1.83
2	Muslim Bagh Flood Dispersal subproject	1,918.73	19.19
3	Siri Toi Dam subproject	4,742.91	47.43
4	Killi Sardar Akhter subproject	83.49	0.83
Mula River basin			
1	Churri subproject	286.78	2.87
2	Pashta Khan & Garambowad subproject	86.88	0.87
3	Karkh River subproject	570.61	5.71
4	Kharzan Hatachi subproject	596.57	5.97
5	Manyalo, Raiko & Rind Ali subproject	641.6	6.42
Total			91.10

Table 5 Operation and Maintenance Estimate for On-Farm Irrigation System

No.	Name of Subprojects	New Irrigated Command Area (hectare)	Improved Irrigated Command Area (hectare)	Total Command Area (hectare)	O&M for On-farm Management (Million PRe)
Zhob River Basin					
1	Ahmedzai subproject	180	427	607	1.42
2	Muslim Bagh Flood Dispersal subproject	0	1,724	1,724	4.05
3	Siri Toi Dam subproject	4,027	0	4,027	9.45
4	Killi Sardar Akhter subproject	0	230	230	0.54
Mula River Basin					
1	Churri subproject	685	115	800	1.88
2	Pashta Khan & Garambowad subproject	377	456	833	1.96
3	Karkh River subproject	250	2,000	2,250	5.28
4	Kharzan Hatachi subproject	106	575	681	1.60
5	Manyalo, Raiko & Rind Ali subproject	364	314	678	1.59
Total					27.77

B. Key Persons Involved in Implementation**Executing Agency**

Irrigation Department,
Government of Balochistan

Officer's Name: M. Saleem Awan
Position: Secretary

Officer's Name: Barkat Ullah
Position: Project Director, Project Management Office
Telephone: +92 3337801713
Email address: technicalbwrpd@gmail.com
Office Address: Quetta Bolochistan

Asian Development Bank

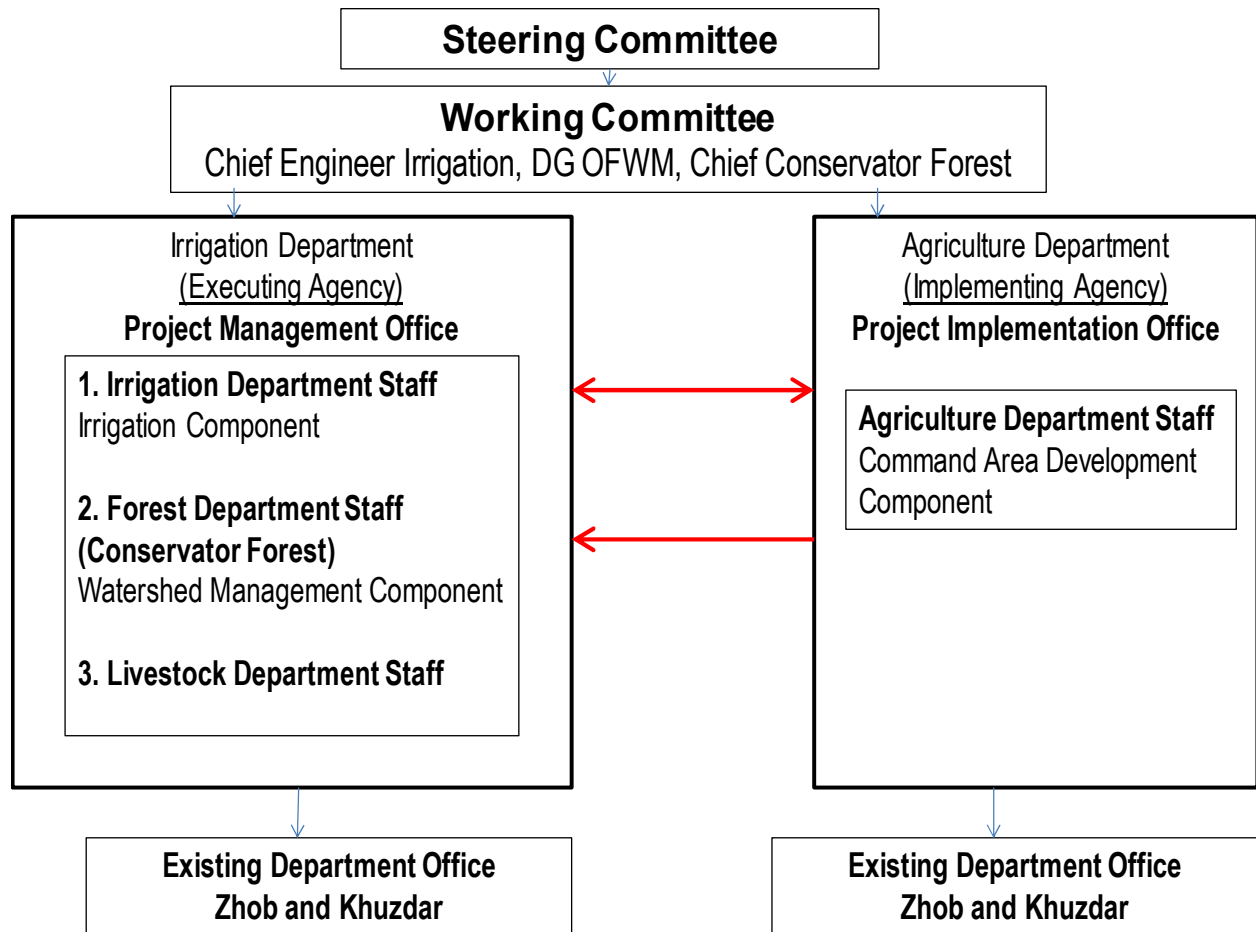
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Mission Leader
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Staff Name: Yaozhou Zhou
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C. Project Organization Structure



Source: Asian Development Bank.

IV. COSTS AND FINANCING

9. ADB will provide \$100 concessional ordinary capital resources loan. ADB will finance the expenditures in relation to civil works, goods, consulting services, recurrent cost (project management), and financial charges during implementation. The Japan Fund for Poverty Reduction (JFPR) will provide contractual parallel grant cofinancing equivalent to \$3 million for Output 2 (ii), and High-Level Technology Fund will provide contractual parallel grant cofinancing equivalent to \$2 million for Output 3 (iii), to be fully administered by ADB. The GOB will finance taxes and duties, resettlement, staff salary for project management and implementation, and contingencies. The GOB shall ensure that counterpart funding is provided in a timely manner to satisfy their liabilities arising from any works, goods and/or consulting services contract, including any additional counterpart funding required for any shortfall of funds or cost overruns.

A. Cost Estimates Preparation and Revisions

10. The technical assistance (TA) consultants prepared the cost estimates in consultation with the Irrigation Department and ACD of the GOB. Costing was completed using government costing standards, and costing information from site investigations, the TA consultants' project files, and queries with suppliers. During project implementation, the PMO together with the PIO will revise the cost estimates with the assistance of the project design, supervision, and implementation support consultants.

11. Costs are itemized below using the following categories:

- (i) **Civil works.** Includes service contracts for construction and installation of project works; and may include provision of related equipment, materials, and supplies. Financed by the ADB loan, with the GOB counterpart funds responsible for tax and duties.
- (ii) **Equipment and goods.** Includes procurement contracts for equipment, materials, and supplies. Financed by the ADB loan, the GOB counterpart funds responsible for tax and duties.
- (iii) **Environment, resettlement, and land acquisition.** Includes expenditures for temporary or permanent occupancy of land and associated resettlement activities and expenditures for implementing environmental management measures. Financed by the GOB counterpart funds.
- (iv) **Consulting services and training.** Includes expenditures for detailed engineering design, construction supervision, and implementation support (procurement and financial management, safeguards implementation and monitoring, project performance monitoring and evaluation). Financed by ADB loan, the GOB counterpart funds responsible for tax and duties.
- (v) **Project management (recurrent cost).** Includes expenditures for PMO and PIO staff and office accommodation. Financed jointly by ADB loan and the GOB counterpart funds.
- (vi) **Physical contingencies.** Budgetary provision to cover unexpected costs and cost overruns. Financed by the GOB counterpart funds.
- (vii) **Price contingencies.** Budgetary provision to cover inflationary increases in costs. Financed by the GOB counterpart funds.

12. The above cost categories include taxes, duties, transport, and insurance costs.

B. Key Assumptions

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

- (i) Exchange rate: PRs110 = \$1.00.
- (ii) Price contingencies based on expected cumulative inflation over the implementation period are as follows:

Table 6: Price Inflation

Item	2018	2019	2020	2021	2022	Average
Foreign rate of price inflation	1.5%	1.5%	1.5%	1.6%	1.6%	1.5%
Domestic rate of price inflation	4.8%	5.0%	5.2%	5.2%	5.2%	5.1%

Source: Asian Development Bank.

- (iii) There are no in-kind contributions.

C. Summary Cost Estimates

14. The project is estimated to cost \$136.14 million (Table 7).

Table 7: Summary Cost Estimates
(\$ million)

Item	Amount ^a
A. Base Cost^b	
1. Irrigation infrastructure and watershed protection constructed and/or rehabilitated	90.74
2. Command area established and/or improved	16.00
3. Institutional capacity strengthened	10.75
Subtotal (A)	117.49
B. Contingencies^c	15.43
C. Financial Charges During Implementation^d	3.22
Total (A+B+C)	136.14

^a Includes taxes and duties of \$10.52 million. Such amount does not represent an excessive share of the project cost. The government will finance the taxes and duties as cash contribution.

^b In mid-2017 prices as of 2 April 2018.

^c Physical contingencies computed at 2.0% for civil work, goods, and services. Price contingencies computed at an average of 5.1% on local currency costs and 1.5% on foreign currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

^d Includes interest charges at the rate of 2.0% per year during implementation.

Source: Asian Development Bank estimates.

15. The summary financing plan is in Table 8.

Table 8: Summary Financing Plan

Source	Amount ^a (\$ million)	Share of Total (%)
Asian Development Bank		
Ordinary capital resources (concessional loan)	100.00	73.4
Japan Fund for Poverty Reduction	3.00	2.2
High-Level Technology Fund	2.00	1.5
Government	31.14	22.9
Total	136.14	100.0

^a In addition, farmer beneficiaries' contribution is estimated at \$0.36 million under Output 2 (ii).

Sources: Asian Development Bank estimates.

D. Detailed Cost Estimates by Expenditure Category

Table 9: Detailed Cost Estimates by Expenditure Category

Item	PRs (million)	\$ (million)	% of Total Base Cost
A. Investment Costs			
1. Civil works	11,221.00	101.66	88.82%
2. Mechanical and equipment	624.00	5.67	4.83%
3. Consultants	783.00	7.47	6.06%
4. Environment, Resettlement and Land Acquisition	55.00	0.50	0.43%
Subtotal (A)	12,683.00	115.30	98.14%
B. Recurrent Costs			
5. Project management	241.00	2.19	1.86%
Subtotal (B)	241.00	2.19	1.86%
Total Base Cost	12,924.00	117.49	100.00%
C. Contingencies			
1. Physical	279.00	2.54	2.16%
2. Price	1,418.00	12.89	10.98%
Subtotal (C)	1,697.00	15.43	13.13%
D. Financial Charges During Implementation			
1. Interest during construction	354.00	3.22	2.74%
2. Commitment fee	0.00	0.00	
Subtotal (D)	354.00	3.22	2.74%
Total Project Cost (A+B+C+D)	14,975.00	136.14	115.87%

Source: Asian Development Bank.

E. Allocation and Withdrawal of Loan and Grant Proceeds

Table 10: Allocation and Withdrawal of Loan Proceeds

No.	Item	Category Total (\$)	Percentage and Basis for Withdrawal from Loan Account
1	Civil works	88,350,000	86% of total expenditure claimed
2	Goods	1,150,000	83% of total expenditure claimed
3	Consulting services and training	6,000,000	83% of total expenditure claimed
4	Recurrent cost -Project management	1,280,000	100% of total expenditure claimed
5	Financial charges during implementation	3,220,000	100% of amount due
Total		100,000,000	

Source: Asian Development Bank estimates.

Table 11: Allocation and Withdrawal of Japan Fund for Poverty Reduction

No.	Item	Category Total (\$)	Percentage and Basis for Withdrawal from Grant Account
1	Civil works	448,200	92% of total expenditure claimed
2	Goods	2,159,340	83% of total expenditure claimed
3	Training	106,240	83% of total expenditure claimed
4	Unallocated	286,220	
Total		3,000,000	

Source: Asian Development Bank estimates.

Table 12: Allocation and Withdrawal of High-Level Technology Fund

No.	Item	Category Total (\$)	Percentage and Basis for Withdrawal from Grant Account
1	Civil works	371,000	92% of total expenditure claimed
2	Goods	1,163,200	83% of total expenditure claimed
3.	Training	243,000	83% of total expenditure claimed
4.	Unallocated	222,800	
Total		2,000,000	

Source: Asian Development Bank estimates.

F. Detailed Cost Estimates by Financier

Table 13: Detailed Cost Estimates by Financier
(\$ million)

Item	ADB		JFPR		High-Level Technology Fund		GOB		Total	
	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	Taxes and Duties
A. Investment Costs										
1. Civil Works	88.35	86.64	0.45	0.44	0.37	0.36	12.84	12.51	101.66	8.16
2. Goods	1.15	22.33	2.16	38.05	1.16	20.50	1.20	21.12	5.67	1.20
3. Consulting Services (including training)	6.00	84.28	0.11	1.49	0.24	3.41	1.12	10.82	7.47	0.77
4. Environment, Resettlement & Land Acquisition	-	-	-	-	-	-	0.50	100.00	0.50	-
Subtotal (A)	95.50	82.83	2.71	2.35	1.78	1.54	15.31	13.28	115.30	10.13
B. Recurrent Costs										
1. Project Management	1.28	58.45	-	-	-	-	0.91	41.55	2.19	0.39
Subtotal (B)	1.28	58.45	-	-	-	-	0.91	41.55	2.19	0.39
Total Base Cost (A+B)	96.78	82.37	2.71	2.31	1.78	1.52	16.22	13.80	114.49	10.52
C. Contingencies										
1. Physical	-	-	0.29	11.28	0.22	8.78	2.03	79.93	2.54	-
2. Price	-	-	-	-	-	-	12.89	100.00	12.89	-
Subtotal (C)	-	-	0.29	1.85	0.22	1.44	14.92	96.71	15.43	10.52
D. Financial Charges During Implementation										
1. Interest during construction	3.22	100.00	-	-	-	-	-	-	3.22	-
2. Commitment fee	-	-	-	-	-	-	-	-	0.00	-
Subtotal (D)	3.22	100.00	-	-	-	-	-	-	3.22	-
Total Project Cost (A+B+C+D)	100.00	73.45	3.00	2.20	2.00	1.47	31.14	22.87	136.14	10.52
% of Total Project Cost	73.45	2.20	2.00	1.47	22.87	100.00				

ADB = Asian Development Bank, JFPR = Japan Fund for Poverty Reduction, GOB = Government of Balochistan.

Note: Numbers may not sum precisely because of rounding.

Source: Asian Development Bank estimates.

G. Detailed Cost Estimates by Outputs and/or Components

Table 14: Detailed Cost Estimates by Outputs
(\$ million)

Item	Total Cost	Irrigation Infrastructure and Watershed Protection Constructed and/or Rehabilitated		Command Area Established and/or Improved		Institutional Capacity Strengthened	
		Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category
A. Investment Costs							
Civil works	101.66	88.79	87.3%	12.54	11.4%	1.33	1.3%
Goods	5.67	0.00	0.0%	3.61	63.6%	2.06	36.4%
Consulting services and training	7.47	0.00	0.0%	0.11	0.2%	7.36	98.6%
Environment, Resettlement, and Land Acquisition	0.50	0.50	100.0%	0.00	0.0%	0.00	0.0%
Subtotal (A)	115.30	89.29	77.4%	15.26	13.2%	10.75	9.3%
B. Recurrent Costs							
Project management	2.19	1.45	66.3%	0.74	33.7%	0.00	0.0%
Subtotal (B)	2.19	1.45	66.3%	0.77	33.7%	0.00	0.0%
Total Base Cost	117.49	90.74	77.2%	16.00	13.6%	10.75	9.2%
C. Contingencies							
Physical	2.54	1.77	69.8%	0.52	20.4%	0.25	9.8%
Price	12.89	11.26	87.3%	1.46	11.4%	0.17	1.3%
Subtotal (C)	15.43	13.03	84.5%	1.98	12.8%	0.42	2.7%
D. Financial Charges During Implementation							
Interest during construction	3.22	2.81	87.3%	0.37	11.4%	0.04	1.3%
Commitment fee	0.00	0.00	-	0.00	-	0.00	-
Subtotal (D)	3.22	2.81	87.3%	0.37	11.4%	0.04	1.3%
Total Project Cost (A+B+C+D)	136.14	106.58	78.3%	18.34	13.5%	11.21	8.2%

Note: Numbers may not sum precisely because of rounding.

Source: Asian Development Bank.

H. Detailed Cost Estimates by Year

Table 15: Detailed Cost by Year
(\$ million)

Item	Total Cost	Year 1	Year 2	Year 3	Year 4	Year 5
A. Investment Costs						
1. Civil works	101.66	3.08	12.55	27.32	33.65	25.06
2. Goods	5.67	0.00	2.81	2.18	0.34	0.34
3. Consulting services (including training)	7.47	0.99	2.69	1.90	1.74	0.15
4. Environment, Resettlement and Land Acquisition	0.50	0.15	0.35	0.00	0.00	0.00
Subtotal (A)	115.30	4.22	18.40	31.40	35.73	25.55
B. Recurrent Costs						
5. Project management	2.19	0.33	0.44	0.44	0.44	0.55
Subtotal (B)	2.19	0.33	0.44	0.44	0.44	0.55
Total Base Cost	117.49	4.55	18.84	31.84	36.17	26.10
C. Contingencies						
1. Physical	2.54	0.10	0.40	0.65	0.75	0.64
2. Price	12.89	0.13	0.92	2.70	4.55	4.59
Subtotal (C)	15.43	0.23	1.32	3.35	5.30	5.23
D. Financial Charges During Implementation						
1. Interest during construction	3.22	0.02	0.13	0.45	1.00	1.60
2. Commitment fee	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal (D)	3.22	0.02	0.13	0.45	1.00	1.60
Total Project Cost (A+B+C+D)	136.14	4.80	20.29	35.64	42.47	32.93
% Total Project Cost	100.00	3.53	14.90	26.18	31.20	24.19

Source: Asian Development Bank.

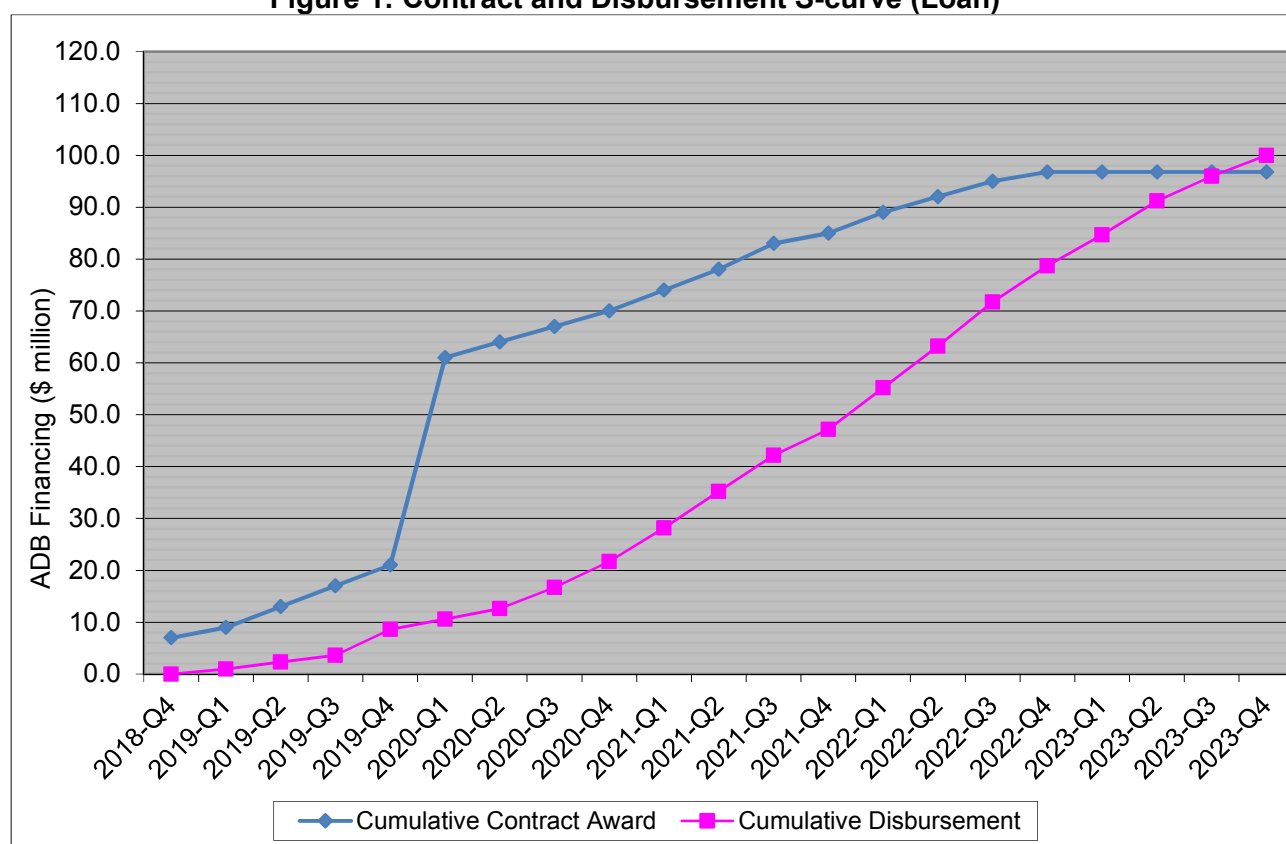
I. Contract Awards and Disbursement Projections

Table 16: Asian Development Bank (Loan)
(\$ million equivalent)

Year	Projections for Contract Award					Projections for Disbursement				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
2018	0.0	0.0	0.0	7.0	7.0	0.0	0.0	0.0	0.0	0.0
2019	2.0	4.0	4.0	4.0	14.0	1.0	1.3	1.3	5.0	8.6
2020	40.0	3.0	3.0	3.0	49.0	2.0	2.0	4.1	5.0	13.1
2021	4.0	4.0	5.0	2.0	15.0	6.5	7.0	7.0	5.0	25.5
2022	4.0	3.0	3.0	1.8	11.8	8.5	9.5	9.5	7.0	34.5
2023	0.0	0.0	0.0	0.0	0.0	6.0	6.5	4.8	4.0	21.3
Total					96.8					100.0

Source: Asian Development Bank estimates.

Figure 1: Contract and Disbursement S-curve (Loan)



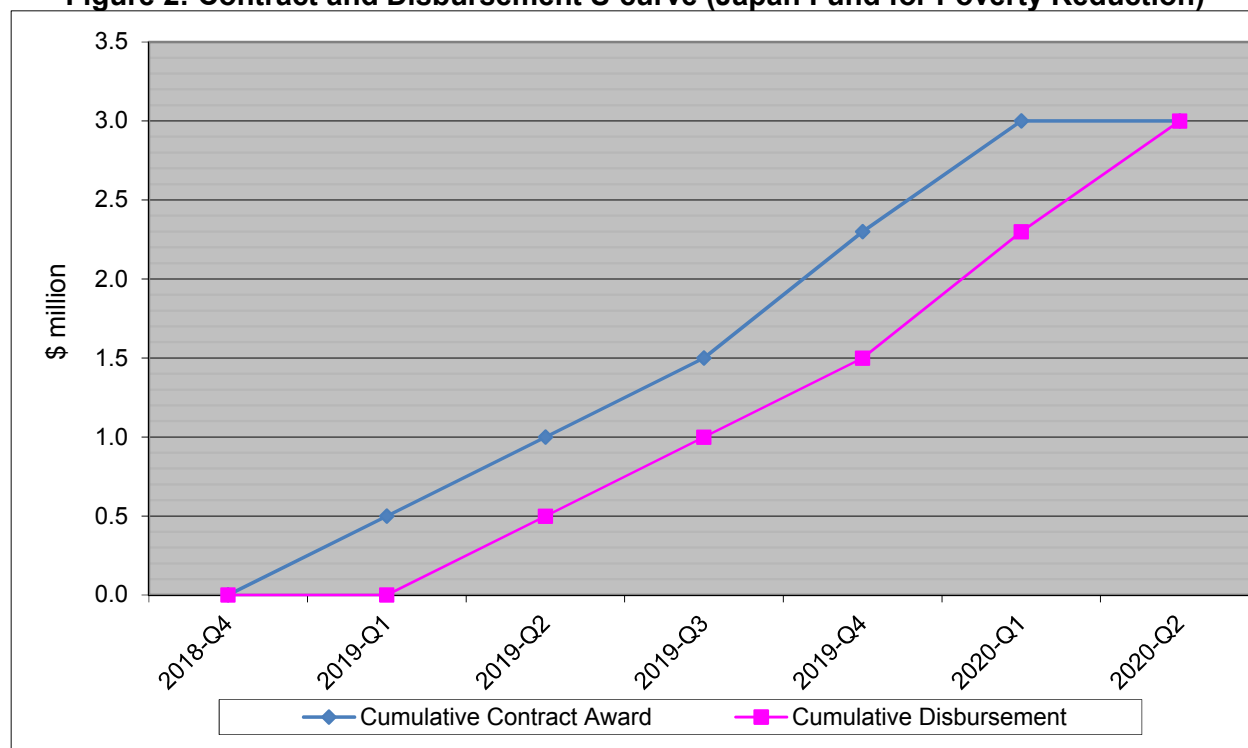
Source: Asian Development Bank.

Table 17: Japan Fund for Poverty Reduction
(\$ million equivalent)

Year	Projections for Contract Award					Projections for Disbursement				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
2018	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2019	0.5	0.5	0.5	0.8	2.3	0.0	0.5	0.5	0.5	1.5
2020	0.7	0.0	0.0	0.0	0.7	0.8	0.7	0.0	0.0	1.5
Total					3.0					3.0

Source: Asian Development Bank estimates.

Figure 2: Contract and Disbursement S-curve (Japan Fund for Poverty Reduction)



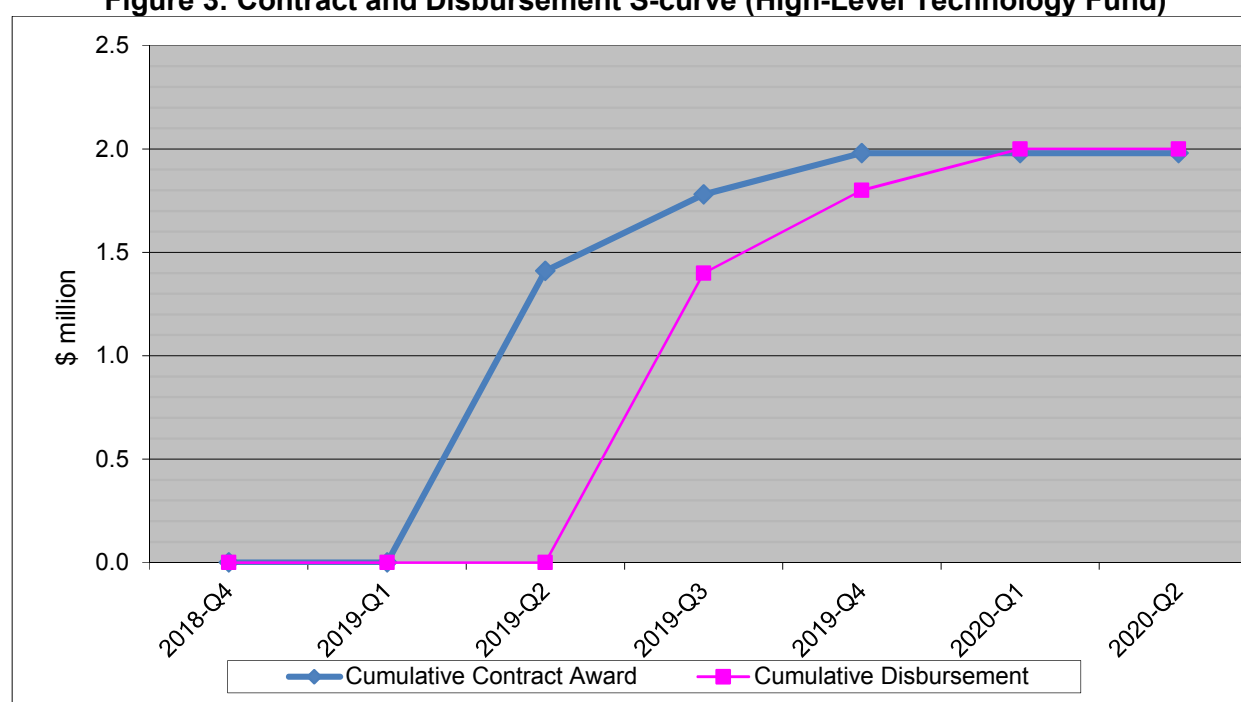
Source: Asian Development Bank.

Table 18: High-Level Technology Fund Grant
(\$ million equivalent)

Projections for Contract Award						Projections for Disbursement				
Year	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
2018	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2019	0.4	1.0	0.4	0.2	2.0	0.0	0.0	1.4	0.4	1.8
2020	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2
Total					2.0					2.0

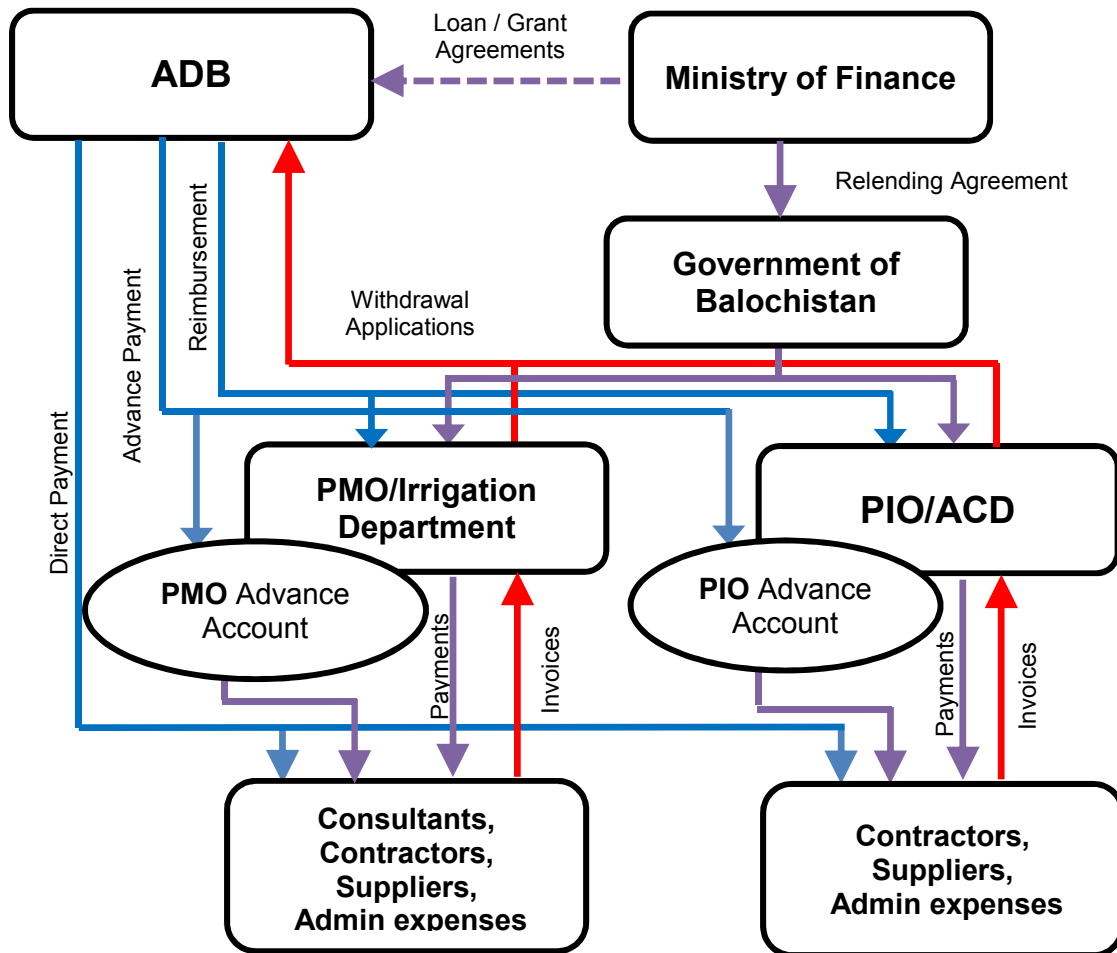
Source: Asian Development Bank estimates.

Figure 3: Contract and Disbursement S-curve (High-Level Technology Fund)



Source: Asian Development Bank.

J. Fund Flow Diagram



ACD = Agriculture and Cooperatives Department, ADB = Asian Development Bank, PIO = project implementation office, PMO = project management office.
 Source: Asian Development Bank.

V. FINANCIAL MANAGEMENT

A. Financial Management Assessment

16. A financial management assessment was conducted in May–July 2017 in accordance with ADB’s Guidelines for the Financial Management and Analysis of Projects and the Financial Due Diligence: A Methodology Note. The financial management assessment considered the capacity of the Irrigation Department and ACD, including funds-flow arrangements, staffing, accounting and financial reporting systems, financial information systems, and internal and external auditing arrangements.

17. Based on the assessment, the key financial management risks identified are (i) execution risk due to financial management systems at Irrigation Development and ACD’s Accounts Officer may not have sufficient understanding of ADB’s financial management requirements and procedures; (ii) implementation risk due to delays in counterpart funding; (iii) compliance risk that expenditure incurred will not be in accordance with applicable legal framework; and (iv) information systems are non-existent, which results in the risk of inaccurate and delayed reporting. It is concluded that the overall pre-mitigation financial management risk of Irrigation Department and ACD is substantial and that the Irrigation Department and ACD have the capacity and suitability to utilize Advance Fund and statement of expenditure (SOE) procedure, with no fixed amount Advance Fund limit and SOE ceiling for single payment, after implementing the mitigation measures. The government, Irrigation Department, and ACD have agreed to implement an action plan as key measures to address the deficiencies.

Action	Responsibility	Resources	Timeline
1. Adopt Financial Management Manual and tailor it accordingly to the need of the project	PMO (Irrigation Department) and PIO (ACD)	PMO Financial Management Staff and PIO Accounts Officer	Within 3 months after loan effectiveness
2. Hire Financial Management Staff for PMO and PIO	PMO and PIO	Project Director	Within 3 months after loan effectiveness
3. Timely opening of Advance Accounts	PMO and PIO	PMO Financial Management Staff and PIO Accounts Officer	Start opening procedure upon effectiveness

ACD = Agriculture and Cooperatives Department, PIO = project implementation office, PMO = project management office.

Source: Asian Development Bank.

B. Disbursement

1. Disbursement Arrangements for ADB and ADB-administered Trust Funds

18. The loan proceeds including ADB-administered funds will be disbursed in accordance with ADB’s *Loan Disbursement Handbook* (2017, as amended from time to time),³ and detailed arrangements agreed upon between the government and ADB. Online training for project staff on disbursement policies and procedures is available.⁴ Project staff are encouraged to avail of this training to help ensure efficient disbursement and fiduciary control.

³ The handbook is available electronically from the ADB website (<http://www.adb.org/documents/loan-disbursement-handbook>).

⁴ Disbursement eLearning. http://wpqr4.adb.org/disbursement_elearning

19. The Irrigation Department and ACD will use direct payment and advance account loan disbursement procedures. The PMO and the PIO will be responsible for (i) collecting and retaining supporting documents, and (ii) preparing and sending withdrawal applications to ADB. In addition, PMO-Irrigation Department will also use commitment procedure should the need arise. Detailed procedures are outlined in ADB's *Loan Disbursement Handbook* and ADB's *Project Financial Management Manual*.

20. **Advance fund procedure.** Two segregate Advance Accounts (each at PMO-Irrigation Department and PIO-ACD) will be established at the National Bank of Pakistan for receipt of funds from ADB. The currency of the advance accounts is US dollar. The advance accounts are to be used exclusively for ADB's and ADB-administered cofinancier funds' share of eligible expenditures. The PMO-Irrigation Department and PIO-ACD who administer the advance accounts are accountable and responsible for proper use of advances to the advance account.

21. The total outstanding advance to the advance accounts should not exceed the estimate of ADB's share of expenditures to be paid through the advance accounts for the forthcoming 6 months. The Irrigation Department (PMO) and ACD (PIO) may request for initial and additional advances to the advance accounts based on an Estimate of Expenditure Sheet⁵ setting out the estimated expenditures to be financed through the accounts for the forthcoming 6 months. Supporting documents should be submitted to ADB or retained by the PMO and the PIO in accordance with ADB's *Loan Disbursement Handbook* (2017, as amended from time to time) when liquidating or replenishing the advance accounts.

22. **Statement of expenditure procedure.**⁶ The SOE procedure may be used for reimbursement of eligible expenditures or liquidation of advances to the advance accounts. The ceiling of the SOE procedure is the equivalent of \$100,000 or below per individual payment. Supporting documents and records for the 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 (WA) to ADB.

23. **Withdrawal applications.** Before the submission of the first WA, the borrower should submit to ADB sufficient evidence of the authority of the person(s) who will sign the WAs on behalf of the government, together with the authenticated specimen signatures of each authorized person. The minimum value per WA is stipulated in the *Loan Disbursement Handbook* (2017, as amended from time to time). Individual payments below such amount should be paid (i) by the Irrigation Department and ACD and subsequently claimed to ADB through reimbursement, or (ii) through the advance fund procedure, unless otherwise accepted by ADB. The borrower should ensure sufficient category and contract balances before requesting disbursements. Use of ADB's Client Portal for Disbursements⁷ system is encouraged for submission of WAs to ADB.

⁵ Estimate of Expenditure Sheet is available in Appendix 8A of ADB's *Loan Disbursement Handbook* (2017, as amended from time to time),

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

⁷ The Client Portal Disbursements facilitates online submission of withdrawal application to ADB, resulting in faster disbursement. The forms to be completed by the Borrower are available online at <https://www.adb.org/documents/client-portal-disbursements-guide>.

2. Disbursement Arrangements for Counterpart Fund

24. For the counterpart share, the government will allocate the budget in the Province's Public Sector Development Program following the government procedures. The Irrigation Department (PMO) and ACD (PIO) will be responsible for (i) preparing disbursement projections, and (ii) requesting budgetary allocations for counterpart funds. The GOB will finance local taxes and duties under the project in cash or through exemption.

C. Accounting

25. The Irrigation Department (PMO) and ACD (PIO) will maintain, or cause to be maintained, separate books and records by funding source for all expenditures incurred on the project following International Public Sector Accounting Standard for cash-based accounting. The Irrigation Department (PMO) and ACD (PIO) will prepare separated project financial statements in accordance with the government's accounting laws and regulations which are consistent with international accounting principles and practices.

D. Auditing and Public Disclosure

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

27. 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, in accordance with the applicable financial reporting standards; (ii) whether the proceeds of the loan were used only for the purpose of the project; and (iii) whether the borrower or executing agency was in compliance with the financial covenants contained in the legal agreements (where applicable).

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

29. The government, Irrigation Department, and ACD have been made aware of ADB's approach to delayed submission, and the requirements for satisfactory and acceptable quality of the audited project financial statements.⁸ 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

⁸ ADB's approach and procedures regarding delayed submission of audited project financial statements:

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

provided to the auditor, if the audits required are not conducted in a manner satisfactory to ADB, or if the audits are substantially delayed. ADB reserves the right to verify the project's financial accounts to confirm that the share of ADB's financing is used in accordance with ADB's policies and procedures.

30. Public disclosure of the audited project financial statements, including the auditor's opinion on the project financial statements, will be guided by ADB's Public Communications Policy 2011.⁹ After the 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 ADB's website. The management letter, additional auditor's opinions, and audited entity financial statements will not be disclosed.¹⁰

VI. PROCUREMENT AND CONSULTING SERVICES

A. Advance Contracting and Retroactive Financing

31. All advance contracting and retroactive financing will be undertaken in conformity with ADB Procurement Guidelines (2015, as amended from time to time) and ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). The issuance of invitations to bid under advance contracting and retroactive financing will be subject to ADB approval. The borrower, executing, and implementing agencies have been advised that approval of advance contracting and retroactive financing does not commit ADB to finance the project.

32. **Advance contracting.** Advance contracting will be used for recruitment of consulting services, goods, and civil works. The steps to be concluded in advance include (i) tendering, bid evaluation for civil works packages, materials, and equipment; and (ii) recruitment of consultants.

33. **Retroactive financing.** The retroactive financing is envisaged relating to (i) project detailed design, construction supervision, and implementation support consulting services; (ii) goods and works; and (iii) provision of training. The maximum amount of eligible expenditures is up to \$20 million, the equivalent of 20% of the total ADB loan, incurred before loan effectiveness, but not more than 12 months before the signing of the loan agreement.

B. Procurement of Goods, Works, and Consulting Services

34. All procurement of goods and works will be undertaken in accordance with ADB's Procurement Guidelines (2015, as amended from time to time). Major civil work contracts include (i) water storage Siri Toi Dam contract to be procured through international competitive bidding; and (ii) multiple contracts, ranging from \$1 million–\$6 million, procured through national competitive bidding, for construction, upgrading, or rehabilitation of weirs, infiltration galleries, allied structures, primary and secondary irrigation network, flood protection works and Siri Toi Dam command area development civil works. In line with ADB's new procurement framework published in 2017, quality will be key consideration for procurement of high-level technology solutions.

35. Before the start of any procurement, ADB and the government will review the public procurement laws of the central and state governments to ensure consistency with ADB's

⁹ Public Communications Policy: <http://www.adb.org/documents/pcp-2011?ref=site/disclosure/publications>

¹⁰ This type of information would generally fall under public communications policy exceptions to disclosure. ADB. 2011. *Public Communications Policy*. Paragraph 97(iv) and/or 97(v).

Procurement Guidelines (2015, as amended from time to time). An 18-month procurement plan indicating threshold and review procedures, goods, works, and consulting service contract packages and national competitive bidding guidelines is in Section C.

36. The community will participate in command area development, farmers managed small irrigation schemes, spate irrigation schemes, and watershed management. This will enhance community mobilization, involvement, ownership, and employment of labor-intensive techniques. The PMO and PIO will enter agreements with farmers organizations (FOs) or community organizations (COs). The FOs/COs will execute the works by purchasing the construction materials through shopping procedures by inviting at least three quotations, preferably from local suppliers. Labor component of the subprojects will be extended by the members of the community, provided adequate expertise exists, who should be reimbursed adequately for the services rendered. In case, FOs/COs cannot identify adequate skilled labor within the community, the work can be let out by inviting quotations from three local contractors. The cost estimates for the works will be based on estimates provided by the PMO, the PIO, and consultants. The consultants will supervise the works and certify payments. Detailed arrangements for community participation in procurement are attached in PAM Annex 2.

37. For command area development, the PIO will procure equipment such as laser land leveler, bed former, shaper and planter, and reversible moldboard ploughs, etc., through shopping procedures and provide to the selected local service provider on cost sharing basis. For this, the PIO will invite application from the interested local service providers and shortlist them based on the selection criterion. For ADB trusted fund supported components, one local nongovernment organization will be hired to assist the ACD in implementing the training on high-value added agri-based businesses.¹¹ Same nongovernment organization can help in designing and delivering the awareness raising sessions on issues such as safe drinking water practices, water borne diseases, and nutritional value of food. It will also help in conducting kitchen gardening training for women and girls. Female social organizers at the field level offices may help in training needs assessment, identification of trainees, collection of data, and consultations with women groups

38. Consulting firm will be engaged using the quality and cost-based selection (QCBS) method with a standard quality cost ratio of 90:10. An estimated 1,474 national person-months of consulting services are required to design, supervise, and strengthen the institutional and operational capacity of the executing agency, the PMO, and the PIO. Individual national consultants of 9 person-months will be selected as dam safety panel of experts to provide independent review of Siri Toi Dam design.

39. The procurement risk assessment concluded that general environment for procurement is satisfactory while the main weaknesses include (i) inadequate experience of the ACD with internationally-financed projects, and (ii) unfamiliar with ADB procurement procedures and requirements. A capacity development plan, including training and consulting services, has been prepared for the Irrigation Department and ACD for improved financial management, procurement, implementation capacity, and institutional reforms.

¹¹ Initial assessment during project preparation and consultants' field visits.

B. Procurement Plan**Basic Data**

Project Name: Balochistan Water Resources Development Sector Project	Executing Agency: Balochistan Irrigation Department
Country: Pakistan	
Loan Amount: \$100 million	Loan Number: xx
Date of First Procurement Plan: 15 Sept 2017	Date of this Procurement Plan: July 2018

1. Process Thresholds, Review and 18-Month Procurement Plan**a. Project Procurement Thresholds**

40. Except as the Asian Development Bank (ADB) may otherwise agree, the following process thresholds shall apply to procurement of goods and works.

Procurement of Goods and Works

Method	Threshold
International Competitive Bidding (ICB) for Works	\$15,000,000 and above
International Competitive Bidding for Goods	\$2,000,000 and above
National Competitive Bidding (NCB) for Works	\$200,000 and above but below \$15,000,000
National Competitive Bidding (NCB) for Goods	\$100,000 and above but below \$2,000,000
Shopping for Works	Below \$200,000
Shopping for Goods	Below \$100,000
Community participation in procurement	For small works and associated materials (no more than \$30,000 for each contract, detailed procedures include in PAM Annex 1)

b. ADB Prior or Post Review

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

Procurement Method	Prior or Post	Comments
Procurement of Goods and Works		
ICB Works	Prior	
NCB Works	Post	Prior review for first bidding of Project Management Office and Project Implementation Office
Shopping for Goods	Post	
Recruitment of Consulting Firms		
Quality- and Cost-Based Selection (QCBS)	Prior ^a	90:10
Recruitment of Individual Consultants		
Individual Consultants	Post	

^a The executing agency requested ADB for recruitment on behalf of the Government of Balochistan.

2. Goods and Works Contracts Estimated to Cost More than \$1 Million

42. The following table lists goods and works contracts for which procurement activity is either ongoing or expected to commence within the next 18 months.

Main Contracts (Infrastructure Works)							
Package Number	General Description	Estimated value (\$ million)	Procurement method	Review (Prior / Post)	Bidding Procedure	Advertisement Date	Comments
ICB-01	Siri Toi Dam	45.17	ICB	Prior	1S2E	Q3/2019	ADB Bidding documents for large works
NCB-01	Karkh River Development Scheme	5.43	NCB	Prior	1S1E	Q4/2019	ADB Bidding documents for small works
NCB-02	Kharzan Hatachi Infiltration Gallery	5.68	NCB	Prior	1S1E	Q4/2018	ditto
NCB-03	Sabakzai Command Area Development	4.67	NCB	Post	1s1E	Q4/2019	ditto
NCB-04	Pashta Khan & Garambowad PIS	4.20	NCB	Post	1s1E	Q1/2020	ditto
NCB-05	PMO Building	1.00	NCB	Prior	1S1E	Q3/2019	ditto
FO Contracts (Command Area Development Works)							
FO-CP-01	Karkh River Development Scheme	1.34	CPP	Prior		Q4/2019	Community Participation

1S1E = one step one envelope, 1S2E = one step two envelopes, CPP = community participation in procurement, ICB = international competitive bidding, NCB = national competitive bidding, PMO = project management office, Q = quarter.

3. Consulting Services Contracts Estimated to Cost More than \$100,000

43. The following table lists consulting services contracts for which procurement activity is either ongoing or expected to commence within the next 18 months

Package Number	General Description	Estimated Value (\$ million)	Recruitment Method	Review	Advertisement Date (quarter/year)	Type of Proposal	Comments
CS-01	Project Design, Construction Supervision and Implementation Support Consultants	6.90	QCBS (90:10)	Prior	Q3/2018	FTP	National

FTP = full technical proposal, QCBS = quality-and cost-based selection.

4. Goods and Works Contracts Estimated to Cost Less than \$1 Million and Consulting Services Contracts Less than \$100,000

44. The following table groups smaller-value goods, works, and consulting services contracts for which procurement activity is either ongoing or expected to commence within the next 18 months.

Main Contracts (Infrastructure Works)							
Package Number	General Description	Estimated value (\$ million)	Procurement method	Review (Prior / Post)	Bidding Procedure	Advertisement Date	Comments
NCB-06	Killi Sardar Akhter PIS	0.80	NCB	Prior	1S1E	Q1/2020	ADB Bidding documents for small works
FO Contracts (Command Area Development Works)							
FO-CP-02	Kharzan Hatachi Infiltration Gallery	0.46	CPP	Post		Q4/2019	
Command Area Development – Goods							
FO-S-01	Karkh River Development Scheme	0.10	Shopping	Post		Q4/2019	Goods
FO-S-02	Kharzan Hatachi Infiltration Gallery	0.024	Shopping	Post		Q4/2019	Goods
Watershed Management Works							
VWC-01	Karkh River Development Scheme	0.17	CPP	Post		Q1/2020	works
VWC-02	Kharzan Hatachi Infiltration Gallery	0.07	CPP	Post		Q1/2020	works
VWC-03	Sabakzai Command Area Development	0.23	CPP	Post		Q1/2020	works
Khushkaba Area Development Works							
KFO-01	Karkh River Development Scheme	0.01	CPP	Post		Q2/2020	works
KFO-02	Kharzan Hatachi Infiltration Gallery	0.06	CPP	Post		Q2/2020	works
KFO-03	Sabakzai Command Area Development	0.23	CPP	Post		Q1/2020	works
PMO/PIO Goods							
PMO -S-01	Equipment & Vehicles	0.5	Shopping	Post		Q2/2019	Goods

ADB = Asian Development Bank, 1S1E = one step one envelope, 1S2E = one step two envelopes, CPP = community participation in procurement, NCB = national competitive bidding, PIO = project implementation office, PMO = project management office, Q = quarter.

Consulting Services

Package Number	General Description	Estimated Value (\$ million)	Number of Contracts	Recruitment Method	Review	Advertisement Date (quarter/year)	Type of Proposal	Comments
ICS-01	Siri Toi Dam Safety Panel of Experts	0.10	3	ICS	Prior	Q1/2019	Biodata	National

ICS = individual consultant system, Q = quarter.

5. Indicative List of Packages Required under the Project

45. The following table provides an indicative list of goods, works and consulting services contracts over the life of the project, other than those mentioned in the previous sections (i.e., those expected beyond the current period).

Main Contract (Infrastructure Works)								
Package Number	General Description	Estimated value (\$ M)	Number of Contracts	Procurement method	Review (Prior / Post)	Bidding Procedure	Advertisement Date	Comments
NCB-07	Manyalo, Raiko & Rind Ali PIS	6.11	1	NCB	Post	1s1E	Q1/2021	ADB Bidding documents for small works
NCB-08	Ahmedzai PIS + FIS	1.74	1	NCB	Post	1s1E	Q4/2021	ditto
NCB-09	Churri Infiltration Gallery	2.73	1	NCB	Post	1s1E	Q4/2021	ditto
Command Area Development & Watershed Management Works- Siri Toi Dam								
NCB-CAD-01	Siri Toi Dam	3.97	1	NCB	Prior	1s1E	Q1/2021	ditto
NCB-VWC-01	Siri Toi Dam	2.58	1	NCB	Prior	1s1E	Q2/2021	ditto
FO Contracts (Command Area Development Works)								
FO-CP-03	Ahmedzai PIS + FIS	0.30	Multiple	CPP	Post		Q1/2023	works
FO-CP-04	Sabakzai Command Area Development	0.43	Multiple	CPP	Post		Q4/2020	works
FO-CP-05	Killi Sardar Akhter PIS	0.12	Multiple	CPP	Post		Q1/2021	works
FO-CP-06	Churri Infiltration Gallery	0.22	Multiple	CPP	Post		Q1/2021	works
FO-CP-07	Pashta Khan & Garambowad PIS	0.37	Multiple	CPP	Post		Q2/2021	works
FO-CP-08	Manyalo, Raiko & Rind Ali PIS	0.34	Multiple	CPP	Post		Q1/2022	works
FO Contracts (Command Area Development Goods)								
FO-S-03	Ahmedzai PIS + FIS	0.05	1	Shopping	Post		Q1/2023	Goods
FO-S-04	Sabakzai Command Area Development	0.05	1	Shopping	Post		Q4/2020	Goods
FO-S-05	Killi Sardar Akhter PIS	0.01	1	Shopping	Post		Q1/2021	Goods
FO-S-06	Churri Infiltration Gallery	0.05	1	Shopping	Post		Q1/2023	Goods

FO-S-07	Pashta Khan & Garambowad PIS	0.05	1	Shopping	Post		Q2/2021	Goods
FO-S-08	Manyalo, Raiko & Rind Ali PIS	0.05	1	Shopping	Post		Q1/2022	Goods
WWC Contracts (Watershed Management Works)								
VWC-04	Ahmedzai PIS + FIS	0.03	Multiple	CPP	Post		Q3/2022	works
VWC-05	Killi Sardar Akhter PIS	0.01	Multiple	CPP	Post		Q1/2021	works
VWC-06	Churri Infiltration Gallery	0.004	Multiple	CPP	Post		Q1/2022	works
VWC-07	Pashta Khan & Garambowad PIS	0.005	Multiple	CPP	Post		Q4/2021	works
VWC-08	Manyalo, Raiko & Rind Ali PIS	0.01	Multiple	CPP	Post		Q3/2022	works
KFO Contracts (Khushkaba Area Development Works)								
KFO-04	Ahmedzai PIS + FIS	0.14	Multiple	CPP	Post		Q3/2022	works
KFO-05	Siri Toi Dam	0.14	Multiple	CPP	Post		Q3/2021	works
KFO-06	Churri Infiltration Gallery	0.04	Multiple	CPP	Post		Q1/2022	works
KFO-07	Pashta Khan & Garambowad PIS	0.01	Multiple	CPP	Post		Q4/2021	works
KFO-08	Manyalo, Raiko & Rind Ali PIS	0.07	Multiple	CPP	Post		Q3/2022	works
FO Contracts (Farmers Managed Small PIS/FIS Improvement)								
FORW-I-Z	Farmers Managed Small PIS/FIS Improvement	1.09	Multiple	CPP	Post		Q4/2021	works
FORW - I-M	Farmers Managed Small PIS/FIS Improvement	1.43	Multiple	CPP	Post		Q1/2022	works
FORW CAD-Z	Farmers Managed Small PIS/FIS Improvement	1.09	Multiple	CPP	Post		Q4/2021	works
FORW – CAD-M	Farmers Managed Small PIS/FIS Improvement	1.43	Multiple	CPP	Post		Q1/2022	works

ADB = Asian Development Bank, 1S1E = one step one envelope, 1S2E = one step two envelopes, CPP = community participation in procurement, NCB = national competitive bidding, PIO = project implementation office, PMO = project management office, Q = quarter.

C. Procurement Plan- Grant Projects

46. The following table lists goods and works contracts under grant for which procurement activity is either ongoing or expected to commence within the next 18 months.

Japan Fund for Poverty Reduction (Grant)								
Package Number	General Description	Estimated value (\$ million)	Number of Contracts	Procurement method	Review (Prior / Post)	Bidding Procedure	Date of first Advertisement	Comments
HVA-NCB-01	Agri-processing facilities	0.56	6	NCB	Post		Q2/2019	
HVA-CP-01	Equipment, materials, and associated works	3.14	Multiple	CPP	Post		Q1/ 2019	
High-Level Technology Fund (Grant)								
HLT-ICB-01	Equipment for river inflow, weather station and groundwater monitoring	1.41	1	ICB	Prior	1S1E	Q1/ 2019	In line with ADB's new procurement policy, "quality" will be a key consideration in this package.
HLT-NCB-01	Civil works for equipment installation	0.37	1	NCB	Post	ISIE	Q3/2019	

1S1E = one step one envelope, CPP = community participation in procurement, ICB = international competitive bidding, NCB = national competitive bidding, PIO = project implementation office, PMO = project management office, Q = quarter.

D. Consultant's Terms of Reference

47. The outline terms of reference are attached in PAM Annex 3.

VII. SAFEGUARDS

48. In compliance with ADB's Safeguard Policy Statement (SPS, 2009), the project's safeguard categories are as follows.¹²

49. **Environment (category A).** A draft environment impact assessment (EIA) for Siri Toi Dam subproject and a draft consolidated initial environmental examination (IEE) report including environment management plans (EMPs) for Karkh River Development Schemes and Kharzan Hatachi Infiltration Gallery were prepared with the assistance of the consultants in accordance with ADB's Safeguard Policy Statement (SPS, 2009). An environment assessment and review framework has been prepared to provide guidance for the preparation of environmental impact assessments (EIAs) or IEEs and EMPs for non-core subprojects during project implementation to ensure compliance with ADB policies, and the laws and regulations of Pakistan. The effective EMP implementation, together with the training and consulting services provided under the project, will mitigate adverse environmental impacts.

50. Balochistan Irrigation Department (BID) / PMO will ensure that:

- (i) updated EIA report, IEEs, and EMPs are prepared for the detailed design as required under the SPS (2009), the Environmental Protection Act, and the provincial environmental rules and regulations;
- (ii) the environmental impact assessment reports are submitted to the Balochistan Environmental Protection Agency and environmental approval is sought thereof before awarding civil works contracts;
- (iii) updated environmental impact assessment reports are submitted to ADB for review and disclosure;
- (iv) follow the implementation requirements of the environment assessment and report framework, including appropriate environmental screening, assessment, and environmental management planning for non-core subprojects.
- (v) the generic EMPs for the EIA and IEEs are included in the bidding documents for all contracts;
- (vi) all contractors assign sufficient resources to implement and record the implementation of each subproject's EMP;
- (vii) all contractors prepare and submit to the BID/PMO for approval at least 10 days before taking possession of any work site, and implement site-specific EMPs;
- (viii) no access to the site will be allowed until the site specific EMPs is approved by the PMO;
- (ix) implementation of the site-specific EMPs is regularly monitored through the PMO and ADB consultants;
- (x) non-compliance notice will be issued to the contractor if the PMO requires action to be taken. The contractor is required to prepare a corrective action plan which is to be implemented by a date agreed with the PMO;
- (xi) the environment-related documents, specifically EIA, EMP, and environmental monitoring reports, are disclosed in the relevant city implementation units and on the project website;
- (xii) in case of unpredicted environmental impacts occurring during project implementation, corrective action plans are prepared and implemented; and
- (xiii) semi-annual safeguard monitoring reports are submitted to ADB within 1 month after the reporting period.

¹² ADB. Safeguard Categories. <https://www.adb.org/site/safeguards/safeguard-categories>.

51. ADB will ensure that:
- (i) monitoring and supervision activities are carried out on an ongoing basis until a project completion report is issued;
 - (ii) project review missions visit project sites to ascertain the status of implementing the EMP with detailed review by ADB's safeguard specialists, officers and/or consultants;
 - (iii) updated environmental impact assessment reports are timely reviewed and disclosed on the ADB website; and
 - (iv) semi-annual safeguard monitoring reports are timely reviewed to be disclosed on the ADB website.

52. **Involuntary resettlement (category B).** All 11 subprojects were preliminarily screened for involuntary resettlement and indigenous peoples safeguards at the project preparatory technical assistance stage. Based on this preliminary screening, only one subproject (Siri Toi Tangi War Dam) was assessed as having involuntary resettlement impacts. The proposed engineering works for the remaining subprojects involve rehabilitation of existing irrigation infrastructure which are restricted to the existing available right-of-way. No impact on indigenous people were noted in any of the proposed subprojects. A draft land acquisition and resettlement plan (LARP) has been prepared for the Siri Toi Tangi War Dam subproject. This draft LARP will be updated following the detailed design. A land acquisition and resettlement framework has been prepared to guide the project in case involuntary resettlement issues are identified during the detailed design or emerge during the implementation of the other subprojects. The BID/PMO shall ensure that:

- (i) the final and implementation-ready LARP for Siri Toi Dam subproject following the detailed design and notification of Section 4 of the LAA is submitted to ADB for review prior to awarding of civil works contracts;
- (ii) the final and implementation ready LARP for Siri Toi Dam subproject duly endorsed by the BID are disclosed to displaced persons (DPs) in their local language in accordance with ADB's SPS (2009);
- (iii) a qualified and experienced external resettlement monitor, acceptable to ADB, is timely recruited to verify the LARP implementation progress, identify emerging land acquisition and resettlement (LAR) issues during subproject implementation and recommend issuance of no-objection by ADB to commencing of civil works;
- (iv) handling over of site/commencing of civil works in subprojects with LAR issues is made only upon completion of the LARP implementation as verified by an external monitor;
- (v) all land and rights-of-way required by the project shall be cleared and made available in a timely manner in accordance with a prepared resettlement plan (RP) and no such clearing should happen if a resettlement instrument is not prepared for a subproject;
- (vi) LARP implementation shall be monitored internally by the PMO with support of its consultants following the monitoring parameters specified in the LARP. The PMO Social and Environment Safeguard Unit will conduct day to day internal supervision and monitoring of LARP implementation progress to ensure compliance with the provisions of the LARP. The LARP implementation progress shall be consolidated into semi-annual internal resettlement monitoring reports to be shared with ADB for review. Bi-annual monitoring and evaluation reports prepared by an external monitor will be submitted to ADB for review and clearance throughout project implementation period. Upon clearance of bi-annual monitoring reports by ADB, these will be disclosed by uploading on the BID and ADB websites;

- (vii) preparing due diligence reports for subprojects to ensure screening is done in accordance with SPS (2009) and additional resettlement plans will be prepared for subprojects with involuntary resettlement impacts, including those with right-of-way clearance, or involving any economic and/or physical displacement;
- (viii) detailed community mobilization and land donation procedures will be prepared during implementation to ensure this is done in a transparent and equitable manner;
- (ix) without limiting the application of the involuntary resettlement safeguards or the LARP, the BID, and the PMO shall ensure that no land shall be acquired for the purpose of the project under the emergency acquisition provisions of Pakistan's Land Acquisition Act (1894), as amended from time to time;
- (ix) the activities of the civil works contractor for the project are in compliance with the approved LARP and no physical displacement or economic displacement shall occur until: (a) compensation at full replacement cost has been paid to all displaced persons in accordance with the final LARP or sections that are ready to be constructed; (b) other entitlements listed in the updated and final LARP have been provided to DPs; and (c) LARP implementation report is submitted to ADB and determined as satisfactory; and
- (x) continued efforts shall be made to link DPs, especially those who are severely affected and vulnerable, to access project-related jobs, other livelihood opportunities and available livelihood support programs and training in the project area.

53. Any unanticipated LAR impacts encountered during implementation of project will be dealt in accordance with the ADB approved LARP and ADB's SPS (2009) requirements. Change to the scope, location, or alignment of subprojects shall be avoided and if during the implementation of any subproject, any such change to the scope, location, or alignment of the project is identified, it shall not be made without prior approval of ADB. Any new LAR-related impacts as a result of changing in subproject scope, location, or alignment will require a new LARP or LARP addendum which should be submitted to ADB for its approval. The additional plan should be prepared following ADB's SPS (2009) and its required guidelines. No construction activities shall be commenced in the sections with new/additional LAR impacts before full implementation of ADB approved LARP is confirmed and cleared by ADB.

54. Under the command area development, farm-level field channel (watercourses) will be constructed, along with small farm turnout structures to distribute irrigation water over 17,255 ha of farmland. Watercourses will be planned, designed, and constructed through close consultation with, and participation by the beneficiary farmers, who will be organized into water users' associations (WUAs). Construction materials will be provided by the project. The WUAs will be responsible for O&M of watercourses and associated structures. The formation of WUAs will be guided and the capacity of WUAs will be strengthened by trainings under technical supervision and guidance by the ACD. The land is provided by the farmer beneficiaries and local communities as counterpart support including other assets such as trees and labor, therefore involuntary resettlement is not involved. As a safeguard measure, the ACD and the PIO shall undertake the following:

- (i) Conduct early screening of the watercourse development to fully determine the impacts, including the land requirements. Consultations with local communities will be undertaken throughout the screening, planning, and implementation phases of each project. Consultations will be recorded in detail and will include all discussions in relation to the donation of land, if applicable.
- (ii) Where land donation is required, obtain written agreements between the parties.

- (iii) Legally transfer to the WUAs donated lands for the watercourse. Only watercourse alignment where there is written confirmation of agreement among all concerned landowners and/or farmers will be included under the project.
- (iv) Put in place a grievance redress mechanism under the ACD/PIO, with representation of the farmer beneficiaries, and local government. A grievance log will be established prior to project implementation and will be available for inspection and reporting by project monitors

55. **Information Disclosure and Stakeholder Participation.** The BID/PMO shall ensure that the RP and monitoring reports are disclosed by: (i) uploading the draft and ADB approved final LARP on the BID and ADB websites, (ii) placing hard copies of approved RP translated into Urdu in the offices of the PMO, District Revenue Department, and representatives of DPs, and (iii) translating the executive summary of ADB approved RPs, bearing information on project impacts, asset valuation, entitlements, compensation budget and provisions with institutional arrangements in place, and providing to the affected community. The PMO shall: (i) conduct additional consultations and regular field visits during updating and implementation of the LARPs; (ii) inform DPs about: (a) resettlement impacts, asset valuation, entitlements, and compensation payment modalities with timelines, and (b) rehabilitation and income restoration measures suggested for the DPs; and (iii) hold regular meetings with surrounding communities and DPs including women and vulnerable groups to share project related information during the project implementation period.

56. **Indigenous peoples (category C).** There are no indigenous peoples in the project area as defined by ADB's SPS (2009). No indigenous communities will be affected by the project and, accordingly, no indigenous peoples planning document is required.

57. **Prohibited investment activities.** Pursuant to ADB's SPS (2009), ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of the SPS (2009).

VIII. GENDER AND SOCIAL DIMENSIONS

58. A poverty, social, and gender assessment was conducted during the project preparation; and several measures are adopted in the project design for social inclusion and improving living standards of rural residents, including (i) command area and watershed development for rural villages and poor; (ii) the involvement of local communities in project design and implementation; and (iii) targeted training for local people, especially for the poor and the women. The overall project is expected to benefit 42,900 rural population. The grant component will address the problem of low agricultural yields, low farm income, and vulnerability in the target areas. The proposed pilot components and activities are exclusively focused on improving the livelihood of the resource-poor farmers including women and the most vulnerable, thus, the grant will directly benefit them.

59. Consultations were undertaken with local communities during project preparation, and their feedback has been incorporated in the project design. Further consultations will be undertaken during the detailed design and implementation, ensuring that local people participate in and benefit from relevant project activities. Community-based methods will be adopted to implement nonstructural activities.

60. The project is categorized as effective gender mainstreaming, and a gender action plan has been prepared. The project will help narrow gaps in women's limited representation in rural

communities of the project areas. Key gender actions and targets will include: (i) of the total consultations, 30% conducted are with women groups during the subprojects' design and construction phase; (ii) of the total subprojects, 30% have facilities for women's increased access to water for domestic use;¹³ (iii) awareness sessions (two [2] each in the subproject areas) on safe drinking water practices, nutritional value of food and water borne diseases conducted for women and girls; (iv) 250 women and girls trained in kitchen gardening skills; (v) at least 250 women trained for income-generating high-value agri-businesses; (vi) at least 22 women led small scale income-generating agri-businesses launched; and (vii) social development and gender specialist hired at the PMO and the PIO, four (4) female social organizers (two [2] each at the field office) hired and provided with transportation facilities.

61. The gender action plan (GAP) will be implemented by the PMO and the PIO with the help of field offices of the Irrigation Department and ACD in Zhob and Mula river basins. The social and gender specialists in the PMO will be responsible for day-to-day coordination and management of the all the social and gender related aspects. The PMO and the PIO will enter agreements with FOs or COs. Female social organizers at the project's field offices will be mobilized to implement the interventions and assess effects on women of the interventions.

¹³ Washing facilities and water supply schemes.

IX. PERFORMANCE MONITORING, EVALUATION, REPORTING, AND COMMUNICATION

A. Project Design and Monitoring Framework

Impact(s) the Project is Aligned with			
Increased farm income in Balochistan (Balochistan Development Vision and Strategy) ^a Improved water resources management in Balochistan (Integrated Water Resources Management Policy Balochistan) ^b			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
Outcome Agriculture productivity in the project area increased	By 2024: a. In Zhob river basin, crop yield (kg/ha) increased to 5,400 for apricot, 2,500 for wheat, 8,900 for hybrid maize (corn), and 10,500 for winter fodders (2014 baseline: apricot 4,500; wheat 2,031; hybrid maize [corn] 7,413; and winter fodder 8,500) b. In Mula river basin, crop yield (kg/ha) increased 3,750 for citrus, 2,700 for wheat, 1,800 for cotton, and 11,000 for winter fodders (2014 baseline [kg/ha]: citrus 3,000; wheat 2,224; cotton 1,277; and winter fodders 9,000)	a–b. GOB's yearly agriculture statistics reports	Climate change may reduce water availability for agriculture
Outputs 1. Irrigation Infrastructure and watershed protection constructed and/or rehabilitated 2. Command area established and/or improved	By 2023: 1a. About 15 irrigation schemes constructed and/or rehabilitated, of the total schemes 30% have facilities for women's increased access to water for domestic use (2017 baseline: 0) 1b. A total of 276 km length of irrigation and drainage canals constructed and/or rehabilitated (2017 baseline: 0) 1c. About 4,145 ha of watersheds protected from water erosion (2017 baseline: 0) 1d. Ground water table in the project area monitoring conducted and reported (2017 baseline: not applicable) 2a. About 11,603 ha land improved and served by rehabilitated irrigation and Khushkaba infrastructure (2017 baseline: 0)	1a–d. Project quarterly progress and completion reports, and loan review missions 2a–d. Project progress and completion reports, and loan review missions	Security situation in the project area deteriorates to the level that it does not allow work on contracts

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
3. Institutional capacity strengthened	<p>2b. About 5,989 ha land developed under new irrigation infrastructure (2017 baseline: 0)</p> <p>2c. About 130 ha of high value agriculture piloted drip irrigation system through JFPR grant (2017 baseline: 0)</p> <p>2d. At least 22 women-led small-scale income generating agri-business launched (2017 baseline: 0)</p> <p>3a. Water resources information system (WRIS) established and operational through technical assistance (2017 baseline: not applicable)</p> <p>3b. High level technology hydro-meteorological equipment used in the field validation of satellite based WRIS data for monitoring of water resources in 3 river basins under Grant Project (2017 baseline: Not applicable)</p> <p>3c. At least 40 trained staff from ID, ACD and PMO/PIO, of which at least 30% are women, increased their project management and implementation skills (2017 baseline: Not applicable)</p> <p>3d. At least 750 trained farmers increased their knowledge and skills on efficient use of water and value-added farming; and at least 250 women trained for income-generating high-value agri-businesses (2017 baseline: Not applicable)</p>	3a–d. Project quarterly progress and completion reports, and loan review missions	

Key Activities with Milestones

1. Irrigation Infrastructure and watershed protection constructed and/or rehabilitated

- 1.1 Prepare detailed engineering design and bidding documents (Q1 2018–Q2 2019)
- 1.2 Complete resettlement plan update and land acquisition (Q2 2018–Q3 2019)
- 1.3 Advertise the Siri Toi Dam construction package through international competitive bidding (Q2 2019)
- 1.4 Conduct procurement of civil works and equipment (Q3 2018–Q4 2019)
- 1.5 Award contracts for irrigation infrastructures including dams, canals, and other structures (Q3 2018–Q3 2019)
- 1.6 Complete civil works construction and equipment installation including dams, canals, and other structures (Q3 2018–Q3 2023)
- 1.7 Complete watershed protection measures (Q3 2018–Q3 2023)

Key Activities with Milestones

2. Command area established and/or improved

- 2.1 Prepare detailed engineering design and bidding documents (Q3 2018–Q3 2019)
- 2.2 Complete resettlement plan update and land acquisition (Q3 2018–Q4 2019)
- 2.3 Conduct procurement of civil works and equipment (Q4 2018–Q4 2019)
- 2.4 Complete command area development or rehabilitation of farmers' managed irrigation facilities (Q4 2018–Q4 2023)
- 2.5 Complete training of farmers on efficient use of water and value-added farming (Q4 2018–Q4 2020)
- 2.6 Complete activities related to awareness raising on safe drinking water practices, nutritional value of food, and kitchen gardening techniques (Q3 2018–Q1 2021)
- 2.7 Complete construction of fruits, vegetables processing and olive oil processing units (Q4 2019–Q1 2022)
- 2.8 Establish 22 women led small scale agri-based businesses (Q4 2019–Q1 2022)

3. Institutional capacity strengthened

- 3.1 Recruit the consultant services package for detailed design, construction supervision and implementation support (Q3 2018–Q1 2019), including advertising the package through advance action (Q3 2018)
- 3.2 Conduct training for ID, ACD, PMO and PIO in project management and implementation (Q3 2018–Q4 2023)
- 3.3 Conduct training for farmers in advanced farming technologies and water management (Q4 2018–Q4 2023)
- 3.4 Procure high technology equipment for improved water resources management (Q1 2019–Q4 2020)
- 3.5 Recruit consulting services for the development water resources information system supported by the technical assistance (Q4 2018–Q3 2020)
- 3.6 Develop the water resources information system (Q3 2019–Q3 2022)
- 3.7 Conduct test and trial operation of water resources information system and provide necessary training to relevant staff (Q3 2022–Q3 2023)

Project Management Activities

- Carry out key activities of GAP and social development action plan (Q1 2019–Q4 2023)
 Conduct and monitor activities of resettlement plan (including land acquisition) and environmental management plan (Q1 2019–Q4 2023)
 Recruit an independent agency for external resettlement monitoring (Q4 2018–Q2 2019)
 Conduct annual and midterm project reviews (Q4 2018–Q4 2023)

Inputs

- ADB: \$100 million (loan)
 Government: \$31.14 million
 JFPR: \$3 million (grant)
 High-Level Technology Fund: \$2 million (grant)

Assumptions for Partner Financing

Not Applicable

ADB = Asian Development Bank, ACD = Agriculture and Cooperative Department, ADB = Asian Development Bank, GAP = gender action plan, GOB = Government of Balochistan, ID = Irrigation Department, JFPR = Japan Fund for Poverty Reduction, kg = kilogram, OCR = ordinary capital resources, PIO = project implementation office, PMO = project management office, Q = quarter.

^a Government of Balochistan. 2014. *Proposed Balochistan Development Vision and Strategy: Concept Note*. Quetta.

^b Government of Balochistan. 2006. *Integrated Water Resources Management Policy Balochistan*. Quetta.

Source: Asian Development Bank estimates.

B. Monitoring

62. **Project performance monitoring.** To monitor the progress of the project in achieving the planned outcome and outputs, the PMO will establish and maintain the project performance management system (PPMS) which will be designed to permit adequate flexibility to adopt remedial action regarding project design, schedules, activities, and development impacts. At the start of project implementation, the PMO and the implementing agencies will develop integrated PPMS procedures to generate data systematically on the inputs and outputs of the components, as well as the indicators to be used to measure the project's impact and outcome taking into account the components' scope. The PMO will be responsible for monitoring and reporting on project performance. The basis for performance monitoring will be the design and monitoring framework, which identifies performance targets for the impact, outcome, and outputs of the project.

63. **Compliance monitoring.** During project implementation, ADB and the PMO will closely monitor the compliance of all the covenants under the project and will take necessary remedy actions for any noncompliance. The compliance status will be reported in the quarterly progress report by the PMO and will be reviewed during project review missions.

64. **Safeguards monitoring.** The PMO together with the PIO will submit to ADB semi-annual safeguards monitoring reports during the construction phase and annual safeguards monitoring reports during the operation phase to ADB and disclose relevant information from such reports to affected persons promptly upon submission. If any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the project or any subproject that were not considered in the respective EIA, IEE, EMP, or RP, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan. No later than 3 months after loan effectiveness, engage qualified and experienced external experts or qualified NGOs under a selection process and terms of reference acceptable to ADB to verify information produced through the project monitoring process, and facilitate the carrying out of any verification activities by such external experts. The PMO together with the PIO will report any actual or potential breach of compliance with the measures and requirements set forth in an EMP or RP promptly after becoming aware of the breach. The 3rd Party Environmental Monitoring Consultant will also submit bi-annual monitoring reports to ADB during construction phase of Siri Toi Dam subproject. Moreover, the supervision consultant will submit monthly environmental monitoring reports to the PMO during the construction phase of subprojects.

65. **Gender and social dimensions monitoring.** Monitoring indicators for the GAP have been incorporated into the PPMS. Clear targets and indicators have been established and some indicators are also captured in the design and monitoring framework. The regular project progress reports will include, at least semi-annually, reporting on GAP indicators. Gender results and impacts will be documented and will be part of the project completion report.

C. Evaluation

66. ADB, the PMO, and the PIO will undertake a semiannual review mission to evaluate the progress of project implementation. ADB, the PMO, and the PIO will undertake a comprehensive midterm review two years after the start of project implementation to have a detailed evaluation of the scope, implementation arrangements, resettlement, achievement of scheduled targets, and progress on the agenda for policy reform and capacity building measures. Feedback from the

PPMS activities will be analyzed. Within 3 months of physical completion of the project, the PMO together with the PIO will submit a project completion report inclusive of gender results to ADB.¹⁴

D. Reporting

67. The PMO will provide ADB with (i) quarterly project progress reports in a format consistent with ADB's PPMS; (ii) consolidated annual reports including (a) progress achieved by output as measured through the indicator's performance targets, (b) key implementation issues and solutions, (c) updated procurement plan, and (d) updated implementation plan for the next 12 months; and (iii) a project completion report within 6 months of physical completion of the project. In addition, the PMO will submit ADB the following reports (i) semiannual environmental monitoring report; (ii) semiannual resettlement monitoring report; and (iii) audited accounts within 6 months of the end of each fiscal year. The PMO will also forward external resettlement monitoring and evaluation reports to ADB.

E. Stakeholder Communication Strategy

68. Project information will be communicated through public consultation, information disclosure mechanism in ADB's and government's website, meetings, interviews, focus group discussions, and community consultation meetings, in accordance with ADB's requirements of information disclosure policy. Main stakeholders are the different government agencies, beneficiaries, affected persons, and participants in the project implementation. Stakeholder communication is also part of the GAP and will be monitored accordingly.

X. ANTICORRUPTION POLICY

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

70. To support these efforts, relevant provisions are included in the loan agreement and the bidding documents for the project.

XI. ACCOUNTABILITY MECHANISM

71. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make an effort in good faith to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.¹⁷

¹⁴ Project completion report format is available at: <http://www.adb.org/Consulting/consultants-toolkits/PCR-Public-Sector-Landscape.rar>

¹⁵ Anticorruption Policy: <http://www.adb.org/Documents/Policies/Anticorruption-Integrity/Policies-Strategies.pdf>

¹⁶ ADB's Integrity Office web site: <http://www.adb.org/integrity/unit.asp>

¹⁷ Accountability Mechanism. <http://www.adb.org/Accountability-Mechanism/default.asp>.

XII. RECORD OF CHANGES TO THE PROJECT ADMINISTRATION MANUAL

72. All revisions and/or updates during the course of implementation should be retained in this section to provide a chronological history of changes to implemented arrangements recorded in the PAM, including revision to contract awards and disbursement s-curves.

Subproject Selection Criteria and Approval Procedure

A. Overview

1. The proposed project will support the implementation of the Government of Balochistan's (GOB's) integrated water resources management policy. The policy describes the provincial situation of severe water scarcity, inefficient use, lack of data, prolonged droughts, and the consequences for rural livelihoods and economic growth. It adopted 15 "policy thrust areas" to improve and sustain the management of surface and groundwater resources. The policy provides a comprehensive framework for the province to address the issues of water management and development in the context of basin approach, with water harvesting and groundwater recharging as an integral part of watershed management. The project will use sector lending modality. The proposed sector loan modality provides the government the flexibility necessary to ascertain that the most urgent problems are addressed in a timely manner.

2. The subproject selection follows four steps: (i) identifying two river basins where the subprojects will be selected; (ii) shortlist 40–50 subprojects from the wish list of over 300 subprojects; (iii) ranking the shortlisted subprojects; and (iv) select the candidate subprojects to be included in the project, including identification of three-core subprojects. The selection criteria and scoring were drafted by the technical assistance (TA) consultants and then discussed and agreed with the GOB's relevant departments and ADB.

3. During project preparation, two (Zhub and Mula) out of four river basins were selected and eleven potential subprojects in the two river basins were also selected for potential ADB financing based on a set of criteria such as water and land availability, economic viability, and a balanced approach to extending development support to different tribal groups. Three core-subprojects, Siri Toi Dam in Zhub river basin, and Karkh River Development Scheme and Kharzan Hatachi Infiltration Gallery in Mula river basin, were selected for detailed assessment of their environmental, social, economic and financial, and technical viabilities.

B. Selection of River Basins

4. To select two potential river basins which are hydrologically endowed in terms of availability of water and having potential for development of irrigated lands for agriculture to provide new sources of livelihood to the rural communities. The selection was largely based on the delineation of the four river basins¹ identified jointly by the GOB and ADB using the geographic information system (GIS) and image processing for the satellite data. The basin geographical area was estimated using the GIS approach. Multi-locational historical data of rainfall was collected within each river basin to estimate the internally generated surface water, water use in irrigated agriculture, and balance water available for future development of irrigated agriculture. The rural communities in the selected river basins are relatively deprived for large scale investments in the last decade to ensure equitable allocation of resources to different basins.

5. The criteria for selection of river basin was based on the following three elements:

- (i) Availability of water per unit of land for the development of irrigated agriculture using available water for future development and available lands for the development of command area. This was a single-most important element of the

¹ The delineation of four river basins was made by using ASTER and SRTM 30m x 30m data and then preparing the layers of stream network, DEM and other related layers.

criteria essential for identification of potential for future development of water in a given river basin.

- (ii) The GOB priority for the selection of basin is to ensure equitable distribution of resources to different river basins.
- (iii) Number of investment projects financed by the federal and provincial governments and/or financed by the large donors like the World Bank, ADB, and IFAD.

6. Table 1 and Table 2 below show the results of the assessment. The top-ranking two river basins Zhob and Mula having higher potential for future development of water are selected. The details of ranking of different parameters are:

- (i) The Zhob and Mula river basins were having the same aggregate rank of 12, which was highest in the four selected river basins. The aggregate rank of Hingol river basin was 11. The Pishin-Lora basin rank was 6 (Table 2). Therefore, Hingol and Pishin-Lora river basins were dropped based on lower aggregate ranks.
- (ii) The elements of criteria used for ranking largely related with water and land availability for future development of irrigated agriculture.
- (iii) Criteria of large investment projects implemented or in progress was largely in the Pishin-Lora basin, where the World Bank and the GOB have completed Balochistan Small-Scale Irrigation Project in 2015. The construction of three dams for water supply to Quetta is in process for the award of contract to provide 35.1 million gallons per day of water supply to Quetta metropolitan, which is a sizable amount. As Quetta fall in the Pishin-Lora basin, therefore most of the investment was made in this river basin. The other three basins have not completed any irrigation or water supply subproject of large size in the last decade.

Table 1: Results of Data Estimated for the Selection of Two River Basins

Parameters	Hingol	Mula	Pishin-Lora	Zhob
Annual Average Internally Generated Surface Runoff (MCM)	942.0	338.0	302.0	267.0
Annual Water Use (MCM)	136.0	43.0	169.0	110.0
Balance Annual Water Available (MCM)	806.0	295.0	133.0	157.0
Culturable ^a Waste Lands (ha)	214,857.0	325,093.0	119,555.0	119,892.0
Current Fallow within Cultivated Area (ha)	57,022.0	72,823.0	337,052.0	80,946.0
Potential Land (ha) taken as 5% of total land available for development in the River Basin ^b	13,594.0	19,896.0	22,830.0	10,042.0
Balance Water Available/Potential Land (m ³ /ha)	5.9	1.5	0.6	1.6
Number of Large Investment Projects Implemented	0	0	4.0	0

MCM = million cubic meters, m³/ha = cubic meter per hectare.

^a Culturable waste refers to "Lands which are suitable for farming but due to non-availability of water or access to water, it is not being utilized. If water is made available using some irrigation infrastructure, these lands can be cultivated.

^b Value of 5% of the available land having potential for the development of irrigated agriculture is assumed based on the reason that land is not a limiting factor but the water certainly is. Therefore, 5% land assumed for the four river basins range from 10,000 to 23,000 ha, which is a sizable area available for the development of irrigated agriculture.

Source: ADB. 2007. *Technical Assistance Completion Report: Basin-wide Water Availability and Use in Balochistan*. Manila. and Agriculture Statistics of Balochistan, 2013–14.

Table 2: Ranking of Selected Elements of the Criteria for Selection of Two River Basins

Parameters	Hingol	Mula	Pishin-Lora	Zhob
Balance Annual Surface Water Available for Development (MCM) (<i>Threshold Value of 150 MCM is taken for High Potential Basins</i>)	3	3	2	3
Potential Land (ha) (<i>taken as 5% of total land available in the Basin</i>)	2	3	3	3
Balance Water Available/Potential Land (m/ha) (<i>Threshold Value of 1.5m/ha is considered for High Potential Basins, 1.0 for Medium Potential and <1.0 as low potential</i>)	3	3	1	3
Number of Large Investment Projects Implemented <i>– Higher value assigned for basins having lower investment in the last decade to ensue equity in distribution of financial resources (No Past investment is taken as High Potential Basin).</i>	3	3	0	3
Aggregate Rank	11	12	6	12
Rank Assigned in terms of Potential for Future Development of Water	Medium	High	Low	High

MCM = million cubic meters.

Source: ADB. 2007. *Technical Assistance Completion Report: Basin-wide Water Availability and Use in Balochistan*. Manila.

C. Shortlisting and Selection of Candidate Subprojects

7. The shortlisting was largely based on the preparation of long list of subprojects identified by the Irrigation Department and supplemented by the ACD. A long list of 351 subprojects was prepared for the Zhob (168 subprojects) and Mula river basins (183 subprojects). From the long list of subprojects, 67 possible subprojects were shortlisted based on the following criteria (28 and 39 subprojects for Zhob and Mula river basins, respectively):

- (i) Potential for development of new livelihood sources through the development of irrigated agriculture.
- (ii) Subprojects related to spate irrigation or water storage dams as identified in the name of the subproject by the Irrigation Department (out of long list of 351 subprojects).
- (iii) Exclude the individual interventions based schemes like land levelling, rehabilitation of channels, delay action dams, flood control, etc. which did not fulfill the above elements of the criteria and objective to increase farm income (out of the long list of 351 subprojects).

8. The selection of subprojects was largely based on the screening of shortlisted 67 subprojects (28 for Zhob river basin and 39 for Mula river basin) to select 20–30 potential subprojects using the following criteria: (i) water and land availability at the subproject level; and (ii) ratio of catchment area to the command area as an indirect indicator for the assessment of hydrologic endowment of the subproject (the higher ratio means that the subject subproject is having higher hydrological endowment in terms of availability of water). The detailed ranking process is illustrated below:

- (i) Ranks were assigned to 28 and 39 subprojects shortlisted for the Zhob and Mula river basins, respectively.

- (ii) The minimum threshold values for selection of high potential subprojects were based on the water availability of more than 1.5 million cubic meter (MCM) and the command area of 1.0 km² (100 ha). This threshold was developed to select potential subprojects out of the 67 shortlisted subprojects. Based on this criterion, 14 subprojects in Zhob and 15 subprojects in Mula river basins were qualified as potential subprojects having at least 100 ha of land and 1.5 MCM or more of water. Higher value of water was used because spate irrigation subprojects are going to face extreme variability in availability of water. The field studies, integrated surveys, and investigations for the potential subprojects further refined the information related to water availability and command area for the selection of subprojects.

9. The selection of candidate subprojects for ADB financing under the project was carried out based on the following:

- (i) Conduct integrated field surveys and initial field studies for the 29 potential subprojects including aspects of historical water rights, water conflicts, agriculture, inputs, costs, benefits, etc.
- (ii) Environmental framework developed for the basin level—Zhob and Mula including the impacts on upper and lower riparian considering Gomal Zam dam in KP and proposed Naulong dam in Mula River Basin.
- (iii) Conduct initial assessment for the 29 potential subprojects including the potential for development of new command and improvement of land and water in the existing commands and watersheds.
- (iv) Prepare rough design outline for 29 potential subprojects and estimate cost of each of the potential subproject.
- (v) Ranking of all 29 potential subprojects for each of the elements of the criteria and then estimate aggregate rank of each of the potential subproject.
- (vi) Selection of top ranking subprojects worth US\$ 93.06 million. The number of subprojects would depend on the cost of the top ranking subprojects.

10. The following criteria were used for the selection of candidate subprojects:

- (i) Access to drinking water and stock water both in terms of adequacy and quality;
- (ii) Water availability for the development of perennial irrigation, spate irrigation, or water storage dam.
- (iii) Size of command area under perennial irrigation, spate irrigation, or stored water irrigation.
- (iv) Groundwater recharge potential in the watershed area.
- (v) Beneficiaries (direct and indirect) counted actually instead of estimated in the feasibility to justify the subproject – over-projected.
- (vi) Benefit-cost ratio of the subproject.
- (vii) Net value production as an indicator of a feasible and large size subproject.
- (viii) Estimated economic internal rate of return and/or financial internal rate of return for the subproject.
- (ix) Potential safeguard impacts.
- (x) Willingness of water users in cost-sharing and participation.

11. Based on the above criteria, 11 candidate subprojects have been selected for ADB financing. The selected 11 subprojects (including two farmer managed subprojects) are listed in the Table 3 below.

Table 3: List of Candidate Subprojects

No.	Name Subprojects	Total Estimated Cost (Million \$)	Area under Subproject (hectares)					Total
			New Irrigated Command Area	Improved Existing Irrigated Command Area	Total Command Area	Watershed and Groundwater Recharge Area	Khushkaba Farming Area	
1	Ahmedzai PIS + FIS	2.16	180	427	607	52	200	859
2	Muslim Bagh Flood Dispersal	17.90	0	1,724				1,724
3	Siri Toi Dam	49.95	4,027	0	4,027	3,750	361	8,138
4	Killi Sardar Akhter PIS	0.90	0	230	230	22	0	252
5	Farmers Managed PIS/FIS Scheme Improvement	2.07	0	1,710	1,710	0	0	1,710
	Sub Total Zhob River Basin	72.53	4,207	4,091	8,298	3,824	561	12,683
1	Churri Infiltration Gallery	2.91	685	115	800	8	350	1,158
2	Pashta Khan & Garambowad PIS	4.43	377	456	833	6	50	889
3	Karkh Valley Development Scheme	6.73	250	2,000	2,250	210	75	2,535
4	Kharzan Hatachi Infiltration Gallery	6.05	106	575	681	85	378	1,144
5	Manyalo, Raiko & Rind Ali PIS	6.28	364	314	678	13	425	1,116
6	Farmers Managed PIS/FIS Scheme Improvement	2.68	0	2,213	2,213	0	0	2,213
	Sub Total Mula River Basin	29.08	1,782	5,673	7,455	321	1,278	9,054
	Total Zhob & Mula River Basins	101.6	5,989	9,764	15,753	4,145	1,839	21,737
	Total of Core Projects	65.25	4,383	2,575	6,958	4,045	814	11,817

FIS = flood irrigation system, PIS = perennial irrigation system.

Source: Consultant's Report.

D. Selection and Approval Procedure

12. The three core-subprojects will be deemed approved by ADB with the approval of the sector project as the detailed assessments for technical, economic and financial, environmental, and social due diligence has been carried out during the project preparation. For the non-core candidate subprojects identified during the project preparation, the project management office (PMO) together with the project implementation office (PIO) will prepare the feasibility study or the detailed design for each subproject, with the assistance of the project design, supervision, and implementation support consultants, including the initial environmental examination (IEE) and resettlement plan if needed. The IEEs and Resettlement Plans will be submitted to ADB for review and approval in accordance with the environmental assessment review framework and the resettlement framework. If additional subprojects will be proposed during the project implementation, the subprojects will be reviewed by the Project Working Committee and approved by the Project Steering Committee. However, the additional subprojects shall be in the Zhob and Mula river basins. PMO together with PIO will follow the same procedures as those or for the candidate subprojects. The selection of the additional subprojects will use the same criteria developed during the project preparation and summarized below.

Category	Criteria	Minimum Threshold
Resource Criteria	Average water availability (MCM:) >8 High, 4-8 Medium, <4 Low	Average flow rate should be more than 0.085 m ³ /sec (3 ft ³ /sec)
	Available Command Area for development (Ha), >500 High, 250-500 Medium, <250 Low	100 ha
	Groundwater recharge potential in watershed (2-High, 1-Low)	
	Access to drinking water (1-High 2-Low)	
	Design Watershed and Rangeland Area (Ha) >100 High, 50-100 Medium, <50 Low	
	Design Traditional Sailaba Area (Ha) >300 High, 100-300 Medium, <100 Low	
	Design Traditional Khushkaba Area (Ha) >500 High, 250-500 Medium, <250Low	
Social Criteria	Number of Households having Land in Command Area, > 800 High, 800-300 Medium, 300 Low	10
	Willingness of water users in cost-sharing and participation - (2-Yes, 1-No)	Yes
	Involuntary resettlement categorization (2-No impact, 1-Yes with impact)	
Economic Criteria	Litigation (1-Yes, 2-No)	Free from all or any litigation or conflicts
	Gender Economic Activity (2-Yes, 1-No)	
	Cost of Scheme Development per Hectare (Million Rs./ Ha) <0.6 High, 0.6-1.0 Medium, >1.0 Low	
	Benefit-Cost Ratio >1.5 High, 1.2-1.5 Medium, <1.2 Low	1.2
Environmental Criteria	EIRR (%) >18 High, 15-18 Medium, <15 Low	9%
	Environmental Category - A-1, B-2, C-3	
Total Score		
Rank		

EIRR = economic internal rate of return, MCM = million cubic meters, m³/sec = cubic meter per second.

Source: Asian Development Bank.

**Implementation Involving Community Participation
Balochistan Water Resources Development Sector Project**

	Type	Implementing Office/Unit	Financing Share	Contractor/ Service Provider, Goods and Material Provider	Payment Process	Design and Supervision	Operation and Maintenance Responsibility
		Beneficiary	Selection of Beneficiary	Procurement Method and by Whom			
		Department Contract with Beneficiary					
1.	Command Area Development – Works <i>(includes construction of lined watercourses along with associated structures, construction of water storage tanks at head, middle and tail for multiple uses at critical points, katcha (dirt/shingle) tracks for farm to nearby shingle road, rough and/or laser land levelling)</i>	PIO Farmers through Farmers Organization ^a Implementation Agreement	Government: Material Cost (85%–90%) Beneficiary: Cost equivalent to labor cost (~10%–15%) Community / farmers consultation and per command area works design	Works contractor “ADB’s Shopping Procedure” or “NCB” by PIO	<ul style="list-style-type: none"> ▪ Beneficiary contribute in (cash or kind) labor cost to PIO ▪ PIO pays to the community / farmers upon payment milestones 	<ul style="list-style-type: none"> ▪ PIO ensures design through field units. Consultants will verify ▪ PIO checks specifications and measurements. Consultants will verify ▪ Farmers’ Organization supervise implementation and report to PIO (Self Supervision) 	Farmers Organizations responsible for O&M under Implementation Agreement on Court Paper
2	Command Area Development – Goods <i>(includes provision of bed former, shaper and pneumatic planter and reversible moldboard ploughs to the local tractor rentals, laser land leveler complete units (Laser transmitter, receiver, scrapper, soil digging implement, etc.) to local tractor rentals)</i>	PIO Local Tractor Rentals or Service Providers Terms of Partnership to provide	Government: 75% Service Provider: 25% Open advertisement and selection criterion	Manufacturer or dealer of Goods (Selected Firm) <ul style="list-style-type: none"> ▪ Prequalification of Firms by PIO ▪ “ADB’s Shopping Procedure” by beneficiary from the pre-qualified 	<ul style="list-style-type: none"> ▪ Service Provider deposit 25% of Goods cost to PIO ▪ PIO contributes 100% to the Selected Firm upon 	Consultants certify specifications and successful delivery	Service Providers responsible for O&M with manufacturer or supplier warranty

	Type	Implementing Office/Unit	Financing Share	Contractor/ Service Provider, Goods and Material Provider	Payment Process	Design and Supervision	Operation and Maintenance Responsibility
		Beneficiary	Selection of Beneficiary	Procurement Method and by Whom			
		Department Contract with Beneficiary					
		services to local farming community		manufacturers or dealer of Goods	successful delivery, installation and testing of goods <ul style="list-style-type: none"> ▪ Selected Firms provide on-job field training to the service providers (tractor rentals) 		
3	Watershed Management Improvement and Protection <i>(development of earthen micro-catchments, digging of pit, addition of compost, termite treatment and plantation of trees (timber/forest/arid fruits), seeding of native grasses, loose stone and gabion structures at critical locations, small check structures, water storage ponds for establishing the plantation and recharge to groundwater, sub-surface dams using Geo-synthetic liners to reduce the base flow)</i>	PMO through Department of Forest Staff Watershed Users’ Organization Implementation Agreement	Government: 100% Beneficiary: Contribution in kind Community consultation, selection criterion and watershed protection and improvement design	Contractor or material / labor supplier “ADB’s Shopping Procedure” by Watershed Users’ Organization assisted by PMO	PMO pays to the community upon payment milestones or measurements	<ul style="list-style-type: none"> ▪ PMO ensures design through field units. Consultants will verify ▪ PMO checks specifications and measurements. Consultants will verify 	Watershed Users’ Organizations responsible for O&M under Implementation Agreement on Court Paper
4	Farmers Managed Irrigation Schemes Construction and Improvement	PIO	Government: 100%	Contractor or material / labor supplier	PIO pays to the community upon payment	<ul style="list-style-type: none"> ▪ PIO ensures design through field units. 	WUAs responsible for O&M under

	Type	Implementing Office/Unit	Financing Share	Contractor/ Service Provider, Goods and Material Provider	Payment Process	Design and Supervision	Operation and Maintenance Responsibility
		Beneficiary	Selection of Beneficiary	Procurement Method and by Whom			
		Department Contract with Beneficiary					
		Water Users' Association (WUA) ^b	Beneficiary: Contribution in kind	"ADB's Shopping Procedure" by WUAs assisted by PIO	milestones or measurements	Consultants will verify <ul style="list-style-type: none"> PIO checks specifications and measurements. Consultants will verify 	Implementation Agreement on Court Paper
		Implementation Agreement	Community consultation, selection criterion and design				
5	<i>Khushkaba Farming Works^c</i>	PIO	Government: 100%	Contractor or material / labor supplier	PIO pays to the WUAs upon payment milestones or measurements	<ul style="list-style-type: none"> PIO ensures Design through field units. Consultants will verify PIO checks specifications and measurements. Consultants will verify 	Community WUAs responsible for O&M under Implementation Agreement on Court Paper
		Water Users' Association for Khushkaba	Beneficiary: Contribution in kind	"ADB's Shopping Procedure" by community assisted by PIO			
		Implementation Agreement	WUAs consultation, selection criterion and design				
6	High Value Agriculture (<i>installation of cost-effective solar-powered drip irrigation systems, construction and installation of olive oil extraction plants, construction and installation of processing plants for fruits and vegetables</i>)	PIO	Government: 75%	Supplies and Services Companies	<ul style="list-style-type: none"> Farmers': 10% cash contribution to PIO Small Enterprises: 10% cash contribution and provision of land for the enterprise 	Consultants certify specifications and successful delivery	Beneficiary responsible for O&M with Supplies and Services Companies warranty under an Agreement on Court Paper
		WUAs/Farmers	Farmers: 10% cash contribution	<ul style="list-style-type: none"> Prequalification by PIO "ADB's Shopping Procedure" by beneficiary from the pre-qualified manufacturer or dealer of goods 			
		Implementation Agreement	Small Enterprises: 10% cash contribution and land				
			Open advertisement, screening and selection criterion				

	Type	Implementing Office/Unit	Financing Share	Contractor/ Service Provider, Goods and Material Provider	Payment Process	Design and Supervision	Operation and Maintenance Responsibility
		Beneficiary	Selection of Beneficiary	Procurement Method and by Whom			
		Department Contract with Beneficiary					
					development to PIO <ul style="list-style-type: none"> ▪ PIO contributes 100% to the Supplies and Services Company upon successful delivery, installation and testing of goods, works and services 		

ADB = Asian Development Bank, NCB = national competitive bidding, O&M = operation and maintenance, PIO = project implementation office, PMO = project management office, WUA = water users' association.

^a Farmers Organization are Community Irrigation Farmer Organization (CIFO) under the Government of Balochistan 2000.

^b Registered under Water Users' Association Ordinance of 1981 of Balochistan.

^c Khushkaba farming systems is largely dependent on incident rainfall and localized runoff generated from adjacent slopes.

TERMS OF REFERENCE

Consulting Services for Project Detailed Design, Construction Supervision, and Implementation Support

I. Introduction to the Project

A. Project Background

1. The project will support the implementation of the integrated water resources management policy of the Government of Balochistan (GOB). The policy provides a comprehensive framework for the province to address the issues of water management and development in the context of basin approach, with water harvesting and groundwater recharging as an integral part of watershed management.

2. During project preparation, two (Zhub and Mula) out of five river basins were selected and 11 candidate subprojects out of over 300 longlist in the two river basins have been selected for potential ADB financing based on a set of criteria such as water and land availability, economic viability, and a balanced approach to extending development support to geographically wider spread under the selected basins. A list of subprojects is in the Table 1 below.

Table 1 List of Candidate Subprojects

No.	Name Subprojects	Total Estimated Cost	Area under Subproject (hectares)					
		(Million \$)	New Irrigated Command Area	Improved Irrigated Command Area	Total Command Area	Watershed and Groundwater Recharge	Khushkaba Farming Area	Total
1	Ahmedzai PIS + FIS	2.16	180	427	607	52	200	859
2	Muslim Bagh Flood Dispersal	17.90	0	1,724	1,724			1,724
3	Siri Toi Dam	49.50	4,027	0	4,027	3,750	361	8,138
4	Killi Sardar Akhter PIS	0.90	0	230	230	22	0	252
5	Farmers Managed PIS/FIS Scheme Improvement	2.07	0	1,710	1,710	0	0	1,710
Subtotal Zhub River Basin		72.53	4,207	4,091	8,298	4,091	561	12,683
1	Churri Infiltration Gallery	2.91	685	115	800	8	350	1,158
2	Pashta Khan & Garambowad PIS	4.43	377	456	833	6	50	889
3	Karkh Valley Development Scheme	6.73	250	2,000	2,250	210	75	2,535
4	Kharzan Hatachi Infiltration Gallery	6.05	106	575	681	85	378	1,144
5	Manyalo, Raiko & Rind Ali PIS	6.28	364	314	678	13	425	1,116

No.	Name Subprojects	Total Estimated Cost	Area under Subproject (hectares)					
		(Million \$)	New Irrigated Command Area	Improved Irrigated Command Area	Total Command Area	Watershed and Groundwater Recharge	Khushkaba Farming Area	Total
6	Farmers Managed PIS/FIS Scheme Improvement	2.68	0	2,213	2,250	0	0	2,213
Subtotal Mula River Basin		29.08	1,782	5,673	7,492	321	1,278	9,054
Total		101.61	5,989	9,764	15,753	4,145	1,839	21,737

FIS = flood irrigation system, PIS = perennial irrigation system.

Note: Subprojects with yellow highlight are core-subprojects.

Source: Consultant's Report.

B. Project Impact, Outcome, and Outputs

3. The project is aligned with the following impacts: increased farm income in Balochistan and improved water resources management in Balochistan. The project outcome will be: agriculture production in the project area increased. The project has three outputs: (i) irrigation infrastructure constructed and/ improved; (ii) command area and watershed protection expanded and improved; and (iii) institutional capacity strengthened.

4. **Output 1: Irrigation infrastructure constructed and improved.** The output will construct, upgrade, or rehabilitate (i) Siri Toi Dam with storage of 30 million cubic meters including a spillway and a water intake; (ii) weirs and infiltration galleries; (iii) about 276 kilometers of irrigation network, including head works, offtakes, aqueducts, culverts, sluice gates, guide bunds, drop/fall facilities, transition chambers, and livestock drinking facilities; (iv) flood protection works to reduce flood risks to irrigation canals and command area; and (v) facilities for women to increase their access to water for domestic use such as washing pads and water collection points.

5. **Output 2: Command area and watershed protection established and/or rehabilitated.** This output will support (i) command area development of about 17,255 ha (including 2,189 ha Khushkaba farming) to maximize benefits from the irrigation investments (a) construction and rehabilitation of secondary and tertiary canals in schemes identified for improvement under Output 1; (b) construction of lined watercourses; (c) improvement on-farm water management and agronomic techniques, such as land leveling and irrigation scheduling; (c) Kacha track and access road; (d) rain water harvesting and storage facilities; (e) provision of farm machinery; and (f) farming training for sustainable farming; (ii) pilot of about 130 ha high value agriculture in the project area: (a) infrastructure, such as installation of about 160 cost-effective solar-powered drip irrigation systems, construction of two olive oil extraction plants and two processing plants for fruits and vegetables, and construction of at least 22 women-led small-scale income-generating agri-businesses for livestock, strengthening of high-value farming technology to contribute increasing agricultural production; (b) production: strengthening of high value farming technology to contribute increasing agricultural production through demonstration of technology on at least 130 ha in 160 farms will be brought under high-value farming of fruits and vegetables and guidelines on efficient use of water and agriculture inputs; (c) community capacity of high-value agriculture including provision of training for efficient use of water and value-added farming enhanced; (d) awareness programs on safe drinking water practices and food nutrition for women and girls; and (e) about 200 women and girls training in kitchen gardening

skills; and (iii) watershed rehabilitation and protection for about 4,495 ha: (a) rehabilitation of forests (trees and grasses) with ecosystem and livelihood linkages; and (b) land and water conservation activities, such as structure measures (small check dams), water harvesting for production of fuelwood and forages, and small storages ponds for plantation and/or groundwater recharge.

6. **Output 3: Institutional capacity strengthened.** This output will support (i) consulting services for detailed engineering design, construction supervision, and implementation support; (ii) training for the executing and implementing agencies on project management, financial management, procurement, disbursement, gender, and social and environmental safeguards; (iii) procurement of hydro-meteorological equipment to strengthen information collection and water use monitoring; and (iv) building infrastructure for improved project management and training.

C. The Project Cost and Financing Plan

7. The project is estimated to cost \$141.14 million (Table 2).

Table 2: Summary Cost Estimates
(\$ million)

Item	Amount
A. Base Cost	
1. Irrigation infrastructure and watershed protection constructed and/or rehabilitated	90.74
2. Command area established and/or improved	17.16
3. Institutional capacity strengthened	12.55
Subtotal (A)	120.45
B. Contingencies	17.47
C. Financial Charges During Implementation	3.22
Total (A+B+C)	141.14

Source: Asian Development Bank estimates.

8. The summary financing plan is in Table 3. ADB will finance the expenditures in relation to civil works, goods, consulting services, and financial charges during implementation. The GOB will finance taxes and duties, resettlement, staff salary for project management and implementation, and contingencies. The GOB shall ensure that counterpart funding is provided in a timely manner to satisfy their liabilities arising from any works, goods and/or consulting services contract, including any additional counterpart funding required for any shortfall of funds or cost overruns.

Table 3: Summary Financing Plan

Source	Amount (\$ million)	Share of Total (%)
Asian Development Bank		
Ordinary capital resources (regular loan)	100.00	76.1
Japan Fund for Poverty Reduction	3.00	2.3
High-level Technology Fund	2.00	1.5
Government	36.14	20.1
Total	141.14	100.0

Sources: Asian Development Bank estimates.

D. Project Implementation Arrangements

9. The GOB, through the Irrigation Department, will be the executing agency of the project. The Agriculture and Cooperatives Department (ACD) will be the implementing agency with active support from relevant departments (Forestry and Wild Life, and Livestock and Dairy). A project steering committee will be set up to guide and direct project implementation. A working committee will be set up for intra-department coordination and project operational oversight. A project management office (PMO) will be established in Quetta for overall project implementation and coordination. The PMO, led by a Project Director, will have direct responsibility for Output 1, Output 2 (iii), and Output 3. A project implementation office (PIO) will be established in the ACD to implement Output 2 (i) and (ii). For Output 1, the PMO will be supported by the Deputy Director Irrigation in Districts Zhob and Khuzdar. For Output 2 (iii), the PMO will be supported by District Forest Officers and their staff in Districts Zhob and Khuzdar. For Output 2 (i) and (ii), the PMO will be supported by the Deputy Directors, OFWM and their staff in Districts Zhob and Khuzdar. Output 3 will be solely implemented by the PMO with support provided to the PIO. Detailed project management structure is included in the PAM.

10. During project preparation, pre-feasibility for 11 candidate subprojects were prepared. Three core-subprojects were selected for detailed assessment of their environmental, social, economic and financial, and technical viabilities.¹ Feasibility study reports for these three core-subprojects were prepared with necessary topographic survey and geotechnical investigation done.

II. Consulting Services for Detailed Engineering Design, Construction Supervision, and Implementation Support

A. Objectives of the Consulting Services

11. The main objective of consulting services for the Detailed Engineering Design, Construction Supervision, and Implementation Support is to help the PMO and the PIO to design, manage, and implement the project to fulfill the overall requirements of the project as approved and agreed between ADB and the Government of Pakistan. The consultants will ensure achieving the project intended results within the approved implementation period and cost through supporting the PMO and the PIO in (i) preparing detailed engineering design which should be technically viable, economically feasible, environmentally and operationally sustainable, and socially acceptable; including detailed engineering surveys and investigations, designs, drawings, specifications, cost estimates, economic and financial analyses, and social and environmental safeguards assessments; as well as design and support procurement of the project's works including bidding documents and the procurement process; (ii) provide necessary support to the PMO and the PIO for the implementation of the project, including project progress monitoring and reporting and staff capacity development; and (iii) construction supervision and matters assigned to consultants related to implementation of the works to ensure construction quality.

B. Scope of Services

12. The overall duration of services is about 5.5 years, expected to commence in July 2018 and conclude in December 2023. The services include three aspects (i) detailed engineering design, construction drawings, and bidding documents preparation; (ii) project implementation

¹ Includes Siri Toi Dam in Zhob River Basin, and Karkh River Development Scheme and Kharzan Hatachi Infiltration Gallery in Mula River Basin.

support to the PMO and the PIO; and (iii) project construction supervision. The survey, investigation, and detail engineering design are expected to commence after mobilization of consultants and completed within 12 months. The first subproject will be Siri Toi Dam and the detailed engineering design and bidding documents are required to be completed within 6 months of consultants' mobilization. For ready subprojects, bids will be invited, construction supervision team will be mobilized, and works will be awarded. Consultants for the PMO and the PIO's implementation support will be required from commencement to project completion.

B1. Detailed Engineering Design Services

13. The scope of the detailed engineering design services includes the following but not limited to:

- (i) define the hydrological, hydraulic, structural, electro-mechanical, geological, and geotechnical design criteria; collect information; carry out surveys and investigations, and all other activities for completing the detailed engineering design of all the subprojects;
- (ii) update and validate the feasibility studies of the three core-subprojects, recommend and conduct additional surveys, investigations and studies and other such activities to complete the detailed engineering design; and prepare bidding documents leading to award of the contracts;
- (iii) for the remaining 8 subprojects, carry out surveys, investigations, analysis, reports, and other such activities, and prepare detailed engineering design;
- (iv) organization of available meteorological and hydrological data in the catchment area upstream of the subprojects sites; review the necessary available studies and data, and conduct meteorological and hydrological analysis and investigations on temperature, rain/snow fall, discharge, water quality, humidity, sedimentation, evaporation, groundwater, etc.;
- (v) extension and generation of meteorological and hydrological data, and preparation of hydrological inputs for reservoir simulation studies; assessment of historic flows at identified locations; studies of construction diversion flows, flows for various return periods, accompanied by the respective hydrographs;
- (vi) estimate of floods with different return periods accompanied by their respective hydrographs, data and methodology used; studies of sediment discharge and volume;
- (vii) provide the model, methodology, criteria, and calibration used in the flood routing and the spillway capacity; reservoir sedimentation analysis including sediment accumulation and determination of reduction of the dead and useful reservoir/live storage/volume as a function of time after commencing the operation of the reservoir;
- (viii) establish the engineering geological conditions of the subproject areas; compilation of geological maps and reports of the subproject area, and sites based on the available data, maps, and aerial surveys such as regional geological maps, regional geological cross sections and seismic-tectonic maps;

- (ix) geological, geophysical, and geotechnical investigations shall be integrated to the topographic maps; the geotechnical investigations shall include boring in soil, drilling/coring in rock, test pits, trenches, sampling, in-site tests, site tests, laboratory test and reports, and shall establish the soil and rock strata along with their properties. Boreholes shall be drilled at each major structure location, in addition test pits shall also be conducted along the alignment of pressure pipes and canals. Sources of borrow material shall also be identified and tested.
- (x) carry out structural design of structures also keeping in view of the evaluation of available seismological studies in the region, description of seismicity of the region, evaluation of the seismic hazard, findings of the results in the subproject design, review the existing seismic network in the region/zone/project area and propose means to improve it to closely monitor the seismic activity in the region/zone/project area;
- (xi) undertake design of reservoir area and volume curves versus water reservoir elevation; design the distribution system including the control and drainage, on-farm water management and all associated works will be designed in accordance with accepted fundamental of irrigation science, hydraulics, soil mechanics and structural engineering; identify various structures for efficient diversion, storage, and conveyance of irrigation water; prepare layouts of the irrigation system for the command area;
- (xii) prepare topographical maps at the appropriate scales and contour curves for the subprojects area such as reservoir area, watershed area, command area; reservoir and capacity data/curves versus elevation, cross sections; using satellite remote sensing link with the GIS models and integrate with on-site topographic surveys and investigations;
- (xiii) prepare recommendations of water allowance, irrigation intensity, and cropping pattern; prepare capacity and command statements for the watercourses, channels, dams, and weirs; identification of crops suitable for command area; recommend efficient irrigation system models; prepare water balance; collection of agricultural data from primary and secondary resources, and estimation of present agriculture situation in the command area and in the adjacent irrigated areas; formulation of agriculture parameters including land-use, cropping pattern, season of crops, quantity of inputs, cultural operations and production of outputs;
- (xiv) incorporate the climate change risk assessment and incorporate its impact in the design based on findings made available through Climate Risk and Vulnerability Assessment; environmental examination, and subsequent mitigation and monitoring plan;
- (xv) conduct all additional related analyses and other such activities where necessary to provide a basis for design of all pressure pipes, canals, and hydraulic structures;
- (xvi) prepare hydraulic, structural, electro-mechanical and geotechnical design criteria; identify various hydraulic structures for efficient conveyance of irrigation flows;
- (xvii) undertake detailed design of all proposed project works with complete drawings for irrigation system, on-farm water management works (including watercourses). The

irrigation conveyance distribution system will include the canals, pressure pipes, control structures, bridges, falls, outlets, and all associated cross drainage works including electro-mechanical works will be designed in strict accordance with accepted state of the art methods of irrigation science, hydraulics, soil mechanics, and structural engineering;

- (xviii) ensure that teams involved in the design of the distributary and minor canals participate in the walk-through pre-design exercise for community consultation to address their grievances regarding resettlement and environmental issues;
- (xix) prepare bidding documents, and assist the PMO and the PIO in bid evaluation reports, propose the project works into suitable number of contract packages (if changed from the approved procurement plan, provide a justification);
- (xx) advise the PMO/PIO on mode of procurement conducive for attracting local bidders; prepare the bidding documents; assist the PMO in pre-qualification or post-qualification, bid evaluation, and its reports;
- (xxi) assist the PMO/PIO to establish a procurement monitoring system, to allow collection and recording of procurement data for: (a) timely information flow, submission and approval of terms of reference, shortlists, and other requirements; (b) tracking all necessary and critical procurement actions and activities; (c) prompt reporting of contract award information to ADB; (d) preparation of quarterly reports to ADB; and (e) revision of timing of procurement actions including advertising, bidding, contract award, and completion time for individual contracts;
- (xxii) assist the PMO/PIO to develop a contract management system to ensure that records and data are stored systematically and cross-referenced with the financial accounts of the project. The system must allow safekeeping of procurement documentation for easy retrieval and referencing, with adequate paper trails in accordance with generally accepted standards. The contract management system must also be designed to support loan disbursement, reporting, and accounting requirements of the project;
- (xxiii) provide technical support in specifications, procurement, installation, testing, and commissioning of rain and stream gauges;
- (xxiv) conduct economic and financial analysis;
- (xxv) screen or re-screen, update or prepare social and gender, resettlement, environmental, and socio-economic studies and safeguards documents following ADB's Safeguards Policy Statement (2009) and other relevant instructions and guidelines, including update of environmental impact assessment for Siri Toi Dam, land acquisition and resettlement plan for Siri Toi Dam; preparation of environmental impact assessment for Environmental Category A subprojects or initial environmental examination reports for Environmental Category B subprojects, and/or land acquisition and resettlement plan for Resettlement A or B subprojects;
- (xxvi) ensure that teams involved in the design participate in the walk-through pre-design exercise for (a) community consultation to address their grievances regarding

resettlement, water use, social, and environmental issues and; (b) the PMO and the PIO agreement on design;

- (xxvii) prepare an indicative implementation schedule for each subproject, the preconstruction activities, including access and transportation route and method, location of borrow areas for construction materials, construction methodologies, construction equipment, construction labor force requirements, construction camp and site infrastructure, and office facilities, environmental requirements and population resettlement activities; the critical activities and the critical path of activities in the schedule shall be illustrated in the schedule;
- (xxviii) prepare operational and maintenance (O&M) manuals for all the major structures; provide training during design and implementation;
- (xxix) identify risks associated with design assumption and approach, proposed construction methodology and sequencing, construction activities, and recommend risk sharing and mitigation measures;
- (xxx) attend project level and Steering Committee meetings; support the PMO/PIO and ADB missions, as needed;
- (xxxi) rectify, modify, and improve the documents as required after review by the Irrigation Department, allied sister departments of the GOB and ADB.

B2. Construction Supervision Services

14. The scope of contract and construction supervision services will include but not be limited to the following:

- (i) check and ensure the adequacy of the designs and making modifications, where necessary;
- (ii) plan and execute additional surveys, geotechnical investigations and other such activities where necessary to provide a basis for both design modifications and subsequent preparation of construction drawings;
- (iii) check and ensure the adequacy of the hydraulic/structural and geotechnical design criteria for pipe lines, canals, and structures and making modifications where necessary;
- (iv) prepare all required construction (working) drawings, for all aspects of construction works. The consultants shall amplify where necessary the contract drawings and specifications by preparing working drawings, which shall be in sufficient detail to enable the appointed contractor to construct the civil and, mechanical works. Working drawings shall be prepared to normal international standards and completed and issued to the contractors in accordance with the agreed program. The consultants shall also check and approve all designs and working drawings prepared by the contractors;
- (v) undertake full administration of the construction contract acting as the Engineer for the PMO/PIO on-site supervision of the contractors' works for compliance with the

specifications, drawings, bill of quantities and other conditions of contracts. This shall include on-site supervision of the contractors' work for compliance with the specifications, review of the contractor's submissions, verification of progress, the preparation of payment requests; certificates and checking and approving the quality assurance procedures produced by the contractors;

- (vi) put in place a comprehensive quality control program including detailed methodology for inspection, sampling, and testing and confirm its adequacy in the field and laboratory, ensuring satisfactory employment at site;
- (vii) review of contractor's submissions, verification of progress, preparation of interim payment requests, certification, checking and approving the quality assurance procedures produced by the contractors; prepare detailed implementation plans preferably using modern software for monitoring project activities;
- (viii) review and up-date the contractor's program for implementation of various phases of the subprojects and revise critical path analysis;
- (ix) review, confirm, and/or recommend appropriate changes to the contractors and the PMO's proposals during implementation; prepare all supporting documents and provide legal and contract-related support to the PMO and the PIO for contractual disputes and legal actions, adjudication or arbitration between the employer and the contractor;
- (x) inspect and witness tests when necessary during manufacture of electrical and mechanical materials and machinery for compliance with specifications. The cost of such tests shall be recoverable through the procurement contracts;
- (xi) witness any acceptance test and advise the employer whether the works or any part thereof have been completed as per specifications and certify outcome of acceptance test in support of provisional acceptance certificate of completion;
- (xii) carry out measurement of works and agreement of quantities with the contractor(s) and give recommendations, prepare instructions of permissible variations to the works for approval by the employer;
- (xiii) be responsible for verification and certification of all payment certificates including interim payment certificates and final payment certificates;
- (xiv) deal with the claims of the contractors for additional payment, as per procedures described in the conditions of contract;
- (xv) facilitate the formation of the Dispute Board under contract for constructions;
- (xvi) in the event of contractual dispute which may result in legal action, adjudication or arbitration between the contractor and the employer, on the instruction from the employer, the consultants will collate and prepare factual documentation which describes the circumstances of the dispute. If required, the consultants will attend hearings and provide all legal and other support to the employer;

- (xvii) assist the employer in taking over the contract works and prepare list of items of work to be completed by the contractor during defects notification period; also prepare inventory of buildings installation and plants etc.;
- (xviii) supervise the repairs, replacement and installation of mechanical and electrical equipment in a satisfactory and safe manner in accordance with the specifications and contract requirements;
- (xix) prepare responses to audit observations and paras. in respect of the payments made to consultants and assist the employer in getting them resolved;
- (xx) prepare all the supporting documents and provide support to the employer in legal proceedings and attend court /hearing(s) if required;
- (xxi) prepare Environmental Management Plan (EMP) in the bidding documents, review, and supervise implementation of the environmental mitigation measures and monitoring plan in line with ADB's Safeguard Policy Statement (2009); update the gender action plan and resettlement plans for all locations where project civil works may involve changes in land acquisition and/or livelihood disruption;
- (xxii) prepare monthly and quarterly progress reports from quality control, quantity survey, and field measurements using the latest software or customized program acceptable to the PMO and the PIO;
- (xxiii) prepare a comprehensive construction completion report on completion of the contract, inclusive of as-built drawings based on the "as constructed" drawings, prepared by the contractors, as appropriate; assist the employer in taking over the works and prepare list of items of works to be completed by the contractors during defects notification period;
- (xxiv) attend project level meetings, all Steering Committee meetings and meetings with ADB missions as required; assist the PMO and the PIO in updating the Engineer's Estimate and PC-1 as, and when, required;
- (xxv) prepare a Manual for Operation and Maintenance of the project after completion;
- (xxvi) plan and execute additional surveys, investigations, reports, drawings, and other such activities where necessary to provide a basis for contract or design modifications and any change arises during implementation;
- (xxvii) respond to any query, complaints and observations relating to quality, quantity, and specifications to monitoring and investigating agencies; and
- (xxviii) assist the PMO/PIO and ADB review missions as needed;

B3. Implementation Support Services

15. The scope of implementation support will include but not be limited to the following:

General project, procurement, and financial management:

- (i) assist the PMO and the PIO in coordinating all matters related to project implementation with relevant authorities of the GOB, the local administration, ADB, and other organizations related to project implementation;
- (ii) provide the PMO and the PIO with on-the-job training in implementing the ADB guidelines and procedures, efficient project management, and scheduling techniques;
- (iii) assist the PMO and the PIO in programming project activities, estimating the financial requirements for these activities and the release of funds on time;
- (iv) assist the PMO and the PIO in coordination with other agencies to ensure that the bidding procedures for procurement of works, services, equipment, and materials are in line with ADB procedures, and that all steps are taken expeditiously and in a transparent manner;
- (v) assist the PMO and the PIO to ensure that the accounting standards for the project meets ADB requirements and that the withdrawal applications sent to ADB are complete and are sent on a timely basis;
- (vi) assist the PMO and the PIO to ensure that all periodic reports are prepared systematically, submitted on time, and reflect the real picture of project implementation; that major issues relating to project implementation are brought to the attention of the concerned parties; and that necessary remedial measures are implemented;
- (vii) assist the PMO and the PIO in maintaining detailed financial accounts and other project records, and prepare other documentation as may be required by the Project Director or ADB;
- (viii) provide technical support to the PMO as required specially in submitting withdrawal application to ADB for direct payment of the contractors; and
- (ix) prepare responses to audit observations and paras. in respect of the payments certified by them and assist the employer in getting them resolved.

Social, Gender, Safeguards, Evaluation and Monitoring

- (i) assist the PMO and the PIO to develop a project monitoring and evaluation (M&E) system, including: (a) long-term environmental and social impact monitoring programs; and (b) quantifiable indicators to monitor and measure the performance, level of maintenance and efficiency of the rehabilitated system;
- (ii) assist the PMO and the PIO to ensure that environmental mitigation measures will be implemented in accordance with the EMP and reported in the quarterly progress reports and the bi-annual environmental monitoring report;
- (iii) assist the PMO and the PIO to ensure the implementation and reporting of measures specified in the land acquisition and resettlement framework and plan;
- (iv) assist in the implementation of the gender action plan and other social actions in

the project design, which includes, among other things, actions that promote women's involvement in the project implementation;

- (v) assist the PMO and the PIO in establishment, management, and reporting of an effective grievance redress mechanism, ensuring that any concerns and complaints are resolved in a timely and effective manner;
- (vi) assist the PMO and the PIO in following-up on actions needed to address issues and recommendations raised in the internal and external resettlement monitoring reports; and
- (vii) assist the PMO and the PIO to use the Socioeconomic Survey prepared during the project preparation to compile a benchmark database incorporating information on economic and social conditions including public health parameters in the project area to provide a comprehensive socio-economic profile of the beneficiary communities; and assist the PMO and the PIO to plan and conduct a midterm socioeconomic survey that updates the survey for the project area.

III. Reporting Requirements

A. Reports/Deliverables

16. The consultant will prepare and submit the following reports, designs, and drawings to the PMO, the PIO and ADB, including soft copies of the reports in word/pdf formats and copies of all drawings in Autocad will be provided.

- (i) **Inception Report:** It will cover review of existing information, data, reports, surveys, studies, investigations, design reports, and safeguards documents available from or through the PMO primarily including reports prepared during the project preparation stage. Based on the findings of the review and additional work done by the consultants, provide an inception report which will include detail of (a) additional field investigations, surveys, studies required for core-subprojects; (b) proposed field investigations, surveys, studies required for feasibility studies and detail design of non-core-subprojects; (c) mobilization of design experts (field and home office); (d) engineer's facilities; (e) detailed work program for the services and reports submission especially program of completion of subprojects-wise surveys, investigations, feasibility studies and detail design; (f) draft quality control plan/manual; and (g) findings and recommendations for review and appraisal by the PMO and the PIO.
- (ii) **Design Reports for Three Core-Subprojects:** The consultants shall prepare and finalize detailed engineering design, construction drawings, survey, investigation, studies, design reports, and cost estimates of all the three core-subprojects. The consultants will prepare construction schedule using critical path method analysis and schedules for annual construction expenditures, both for local and foreign currency components, throughout the construction period.
- (iii) **Feasibility Reports for Non-core-Subprojects:** The consultant shall submit the draft feasibility report of each of none core-subproject citing multiple various alternatives for review by the PMO and the PIO. The final report shall be submitted after incorporating comments of the PMO and the PIO. The reference to design

codes, parameters, standards, criteria, and calculation used will be referenced in the feasibility reports. Soft copy of the design calculations in excel file or any other software used will be submitted with the design reports.

- (iv) **Design Reports for Non-core-Subprojects:** The consultants shall prepare detailed engineering designs, construction drawings, survey and investigation reports, design reports, and cost estimates of all the subprojects reservoir, weirs, irrigation system, on-farm water management components, water shed management, and allied works. The consultants will prepare construction schedule using critical path method analysis and schedules for annual construction expenditures, both for local and foreign currency components, throughout the construction period. The reference to design codes, parameters, standards, criteria, and calculation used will be referenced in the feasibility reports. Soft copy of the design calculations in excel file or any other software used will be submitted with the design reports. The consultant shall first submit the draft Detailed Design Report for review by the PMO and the PIO. The final report shall be submitted after incorporating comments of the PMO and the PIO.

- (v) **Drawings:** The consultants will prepare draft drawings for the basis of review of the PMO and the PIO. After finalization, the consultant will submit drawings for bidding which should be with sufficient detail and completeness to be used for bidding as well as construction. After award of the works, the construction drawings completeness will be jointly checked and confirmed by contractors and consultants through the agreed program of joint surveys which shall not take more than one month from award of contract. No significant variation or modification should arise as a result of joint surveys, confirming thereby the accuracy of surveys, design, and drawings prepared by the consultants. The consultants shall also check and approve all detail shop drawings prepared by the contractors before commencement of specific work. The consultants shall prepare the bidding documents in line with ADB's Guidelines and Procurement Plan. The bidding documents shall cover the civil/electro-mechanical works of the project and its components.

- (vi) **Engineer's Estimate:** The consultants shall prepare 'Engineer's Estimate' of the expected cost of construction immediately prior to the issuance of bid documents. This estimate shall be based on the most up-to-date assessment of construction rates prevailing at the time and shall include all items such as contractor's mobilization and insurance costs, allowance for all necessary provisional sums and estimated day works, and contingencies. One copy of the 'Engineer's Estimate' shall be issued to the PMO and the PIO and the contents therein shall be treated with utmost confidentiality. For the purpose of cost estimating:
 - (a) all unit prices for major quantities of work shall be established by the latest methods. These methods will simulate each construction activity in such a way as to fit it into the available time span in the proposed construction schedule. Construction equipment, crews, materials, and other resources would be adjusted to accomplish the work within the required time span. The computations of unit prices shall be supported by detailed sets of financial prices with source;
 - (b) indirect cost of construction for all major items, into which the construction work is subdivided for cost estimating purpose, should be established separately. Total cost of each construction item shall

- then be obtained by multiplying the direct cost of construction by a bid factor representing the influence of indirect cost;
- (c) preparation of cost estimates broken into local and foreign components. These shall include:
- reasonable breakdown by major items of electro-mechanical and civil works, irrigation system, on-farm water management, and water shed management works. Price for major civil works and permanent equipment shall be estimated keeping in view the procurement packaging, transportation cost, security cost allowance, complexity of works, and hard area factors;
 - environmental management plan cost estimation;
 - resettlement action plan cost estimation;
 - project engineering and management expenses and an adequate allowance of physical contingencies; and
 - import duties, taxes and interest during construction (to be assessed separately and not be included in the base cost estimate).
- (vii) **Bidding Documents:** The consultants will prepare bidding documents in line with the Procurement Plan or updated Procurement Plan using ADB's model or standard bidding documents and documents for express of interest and request for proposal.
- (viii) **Safeguards Reports:** The consultants shall update land acquisition and resettlement plan for Siri Toi Dam and prepare resettlement report for any subprojects with resettlement impact after screening in line with the land acquisition and resettlement framework. The consultant shall prepare the initial environmental examination (IEE) reports for non-core-subprojects and update the environmental impact assessment report for Siri Toi Dam subproject and IEE for the two core-subprojects if needed, including the amendment to the generic environmental management plan.
- (ix) **Quality Assurance Plan/Manual:** Quality Assurance Plan/Quality Control manual shall be presented which shall include comprehensive quality control program including detailed methodology for inspection, sampling, and testing and confirming its adequacy in the field.
- (x) **Midterm Report:** The midterm report will present the following studies and conclusions under:
- (a) additional field surveys/investigations to be conducted under the supervision of the consultants together with optimization study of each alternative will be carried out;
 - (b) project layouts for different infrastructures for implementation and operation stage of the project shall be developed;
 - (c) the population resettlement and environmental aspects of the project shall be reassessed at this stage of the study and quantified. The cost of resettlement and environmental aspects and proposed design shall be assessed for the economic and financial viability of the project;
 - (d) the consultants shall present their conclusions and recommendations to the above effects in the midterm report for review and concurrence by the PMO and the PIO.

- (xi) **Project Performance Reports:** The consultants will submit a monthly and quarterly progress reports on project and contract management, status of the program, the contractor's progress and performance, quality of work, the financial status and disbursements projections, and highlighting issues that are affecting the planned progress of the project and possible remedies.
- (xii) **Project Completion Report:** The consultant shall assist the PMO/PIO in preparing the Project Completion Report (PCR) following ADB's requirements regarding contents and format. The main objective of the PCR is to learn from the experiences of borrowers, the GOB, and ADB in implementing projects, and to use the lessons to improve the performance of ongoing and future ADB-financed projects. The PCR will also be used as a measure of ADB's development effectiveness and as an input to country strategy formulation. The report shall describe the civil works and operational procedures, highlighting any specific requirements, list any major problems encountered and detail what actions were taken, review the training needs for the operating staff and give appropriate recommendations and, summarize the final quantities and financial statement. The PCR shall include as-built drawings based on the "as constructed" drawings, prepared by the contractor. The draft PCR shall be submitted upon completion of each subproject. After review by the PMO and the PIO, the final report shall be submitted within one-month after receiving the PMO and the PIO comments or 60 days whichever is later.
- (xiii) **Operation and Maintenance Manuals:** The draft and final version of the O&M manual shall be prepared. The O&M manual shall give the nature of periodic inspections to be made, physical interventions to be made by way of preventive and curative maintenance to be carried out every year, data to be collected, and records maintained. The O&M procedures should be detailed and those should be doable to maintain integrity of the structures for their design life. As a result, yard sticks (both physical and financial) for the maintenance intervention works need to be prepared to facilitate planning of the O&M activities every year. The draft O&M manual shall be submitted within one year after the construction starts. The final O&M Manual will be submitted upon completion of each subproject one month after receipt of comments from the PMO/PIO and ADB.
- (xiv) **Other reporting requirements:** The consultant shall obtain the client's prior approval in writing before taking any of the following actions:
 - (a) any change or addition to the consulting services personnel;
 - (b) the consultants may subcontract work relating to the services to an extent and with such experts and entities as may be approved in advance by the client. Notwithstanding such approval, the consultant shall retain full responsibility for the services. In the event that any subconsultants are found by the client to be incompetent or incapable in discharging assigned duties, the client may request the consultant to provide a replacement, with qualifications and experience acceptable to the client, or to resume the performance of the services itself; and
 - (c) variations in works contract resulting in an increase of the accepted contract amount or extension of time.

B. Time Schedule for Reports/Deliverables

17. The consultants will submit the reports in hard and soft copies within the time given in the following table:

Table 4: Timeline for Submission Reports

Reports	Copies	Submission dead lines
Inception Report	5	1 month after the effectiveness of Consulting Services Agreement
Design Reports for Three Core-subprojects	5	6 months after the effectiveness of Consulting Services Agreement
Feasibility Reports for Non-core-subprojects	5	Individual subproject reports will be submitted sequentially, submitted from 6 months to 10 months after the effectiveness of Consulting Services Agreement
Design Reports for Non-core-subprojects	5	Individual subproject reports will be submitted sequentially, submitted from 7 months to 12 months after the effectiveness of Consulting Services Agreement
Drawings	15	Bidding and Construction drawings within the design reports schedule given above
Engineer's Estimate	1	Draft submission within the feasibility reports schedule given above Final Submission within the design reports schedule as given above
Bidding Documents	15	2 weeks after submission of the design reports
Safeguards Reports	5	Submission within the feasibility reports schedule given above (In case of unanticipated land acquisition and resettlement, one month after detail assessment is completed)
Quality Assurance Plan/Manual	5	3 months after the effectiveness of Consulting Services Agreement
Midterm Report	10	24 months after the Effectiveness of Consulting Services Agreement
Project Performance Reports	5	Quarterly and yearly reports starting 6 months after the effectiveness of Consulting Services Agreement
Project Completion Report	10	Draft upon completion of each subproject Final report shall be submitted within one-month after receiving the project management office comments or 60 days whichever is later
Operation and Maintenance Manuals	5	Draft with midterm report Final upon completion of each subproject

Source: Asian Development Bank.

IV. Indicative Staffing Requirements and Their Qualification

18. The following is the estimation of the composition of the consultants' team for the project but the prospective consultants should propose their own breakdown of staffing and level of effort staff work based on their own evaluation of the proposed services. The consultants should propose a realistic deployment schedule for all positions depending on work requirements as all positions listed below would have inputs for different durations.

19. The consulting services will comprise the following teams:

- (i) **Project Management Team** will be located in Quetta with backstopping support

provided by the consulting firm/joint venture regional and/or head office, as and when required. The team will provide support in the overall project implementation and monitoring/reporting.

- (ii) **Design Team** will preferably be located in Quetta or work through regional/head office with experts travelling to Quetta and the proposed subprojects sites as required. This team will carry out feasibility studies, detailed engineering design of the subprojects, drawings, reports, studies, surveys, consultations, investigations, cost estimates, and bidding documents.
- (iii) **Supervision Team(s)** will be located in Quetta as its main office and in each subproject site as its field office/team. The field teams will be responsible for construction supervision. The field team will be headed by a Resident Engineer who will commute to report to Quetta-based Project Management Team when needed, depending on the supervision plan.

20. The consultants will establish their office at Quetta and field offices as discussed above, for detailed engineering design, construction supervision, and project implementation support. The consultants will evaluate their requirement of rental and maintenance of offices. The cost of renting, furnishing, equipping, and maintaining the offices shall be included in consultant financial proposal.

21. The consulting services will be required over a period of 60 months to provide 432 national person-months of key experts (including 300 person-months for implementation support to the PMO and the PIO) and 1,042 national person-months of non-key experts. The consulting firm will need to identify the needs for technical and administrative support staff and include their costs in the financial proposal. Detailed tasks for each of the experts and support staff will be assigned by the consulting firm in accordance with the overall terms of reference for the consulting services.

Table 5: Summary of Indicative Key and Non-key Expert Requirements

	Position	No. of Experts	Indicative Inputs (Person-Months)	Qualification Requirement	Specific Experience Requirement	Remarks
A. Implementation Support Team						
1	Procurement / Contract Specialist	1	60	Bachelor's degree in engineering, construction management or related field	10 years' experience in procurement and/or contract management and familiar with FIDIC terms. Experience with ADB or World Bank projects using ICB and NCD procedures will be preferred.	PMO
2	Hydraulic Design Expert	1	12	Bachelor's degree in hydraulic structure or related field	10 years' experience in hydraulic design and/or construction.	PMO
3	Dam Design Expert	1	12	Bachelor's degree in civil engineering, or related field	10 years' experience in dam design and/or construction. Experience in dam safety with ADB or World Bank projects will be preferred.	PMO
4	Financial	1	60	Bachelor's	10 years' experience in	PMO

	Management Specialist			degree in finance or accounting, or related field; certified accountant is required.	financial management, accounting, and audit. Working experience in ADB or World Bank projects will be preferred.	
5	Social Development and Gender Specialist	2	12	Bachelor's degree in sociology or related field	10 years' experience in social development, gender and resettlement in large water sector projects. Working experience in ADB or World Bank projects will be preferred.	PMO and PIO
6	Environmental Specialist	1	12	Bachelor's degree in environmental science/engineering, or related field	10 years' experience in conducting environmental impact assessment and/or management in large water sector projects. Working experience in ADB or World Bank projects will be preferred.	PMO and PIO
7	Monitoring and Evaluation Specialist	1	20	Bachelor's degree in project management, impact evaluation or related field	10 years' experience in project performance monitoring and evaluation of large water sector projects. Working experience in ADB or World Bank projects will be preferred.	PMO and PIO
8	On-farm Water Management Specialist	1	20	Bachelor's degree in water resources, irrigation or related field	10 years' experience in water resources and on-farm water management in particular.	PIO
9	High Efficiency Irrigation Expert	1	12	Bachelor's degree in irrigation and drainage, water resources, or related field	10 years' experience in irrigation design and management, including 5 years' experience in applying drip irrigation in the similar regions.	PIO
10	Financial Management Officer	1	48	Bachelor's degree in finance or accounting, or related field; certified accountant is required.	10 years' experience in financial management, accounting, and audit. Working experience in ADB or World Bank projects will be preferred.	PIO
11	Contract Engineer	1	32	Bachelor's degree in civil engineering, construction management, or related field	10 years' experience in contract management and familiar with FIDIC contract terms. Experience with ADB or World Bank projects using ICB and NCD procedures will be preferred.	PIO
Subtotal A			300			
B. Detailed Design and Construction Supervision Team						
B1. Key Experts						
1	Chief Construction Manager / Chief Resident Engineer	1	54	Bachelor's degree in civil engineering, construction management, or	15 years of in planning, designing or construction supervision of large water resources and irrigation projects. Five years'	Team Leader

				related field	specific experience in supervision of dam and irrigation projects in Pakistan in a senior supervisory position. Familiar with FIDIC conditions of contract for construction.	
2	Chief Design Engineer	1	18	Bachelor's degree in civil engineering, or related field	15 years of in planning, designing or construction of large dam/reservoir and irrigation projects. Five years' specific experience in designing dam and irrigation projects in Pakistan in a senior position.	Deputy Team Leader
3	Senior Hydraulic Engineer	1	12	Bachelor in Hydraulic structure or related field	10 years' experience in design and construction of large dam/reservoir and irrigation projects.	
4	Senior Geotechnical Expert	1	12	Bachelor's degree in civil engineering, geology or related field	10 years' experience in hydraulic design and/or construction of large dam/reservoir and irrigation projects.	
5	Senior Irrigation Engineer	1	12	Bachelor's degree in water resources, irrigation and drainage or related field	10 years' experience in design and/or construction of large dam/reservoir and irrigation projects.	
6	Senior Geologist	1	12	Bachelor's degree in geology or related field	10 years' experience in design and/or construction of large dam/reservoir and irrigation projects.	
7	Senior Hydrologist	1	12	Bachelor's degree in hydrology or related field	10 years' experience in conducting hydrological assessment and designing large dam/reservoir and irrigation projects.	
	Subtotal B1		132			
B2. Non-Key Experts						
1	Mechanical Engineer	1	12	Bachelor's degree in mechanical engineering or related field	10 years' experience in designing and installing of gates and hoisting arrangements for large hydraulic structure.	
2	Agricultural Specialist	1	8	Bachelor's degree in agriculture science or engineering, or related field	10 years' experience in agricultural research, extension services, and design of agriculture projects.	
3	Watershed Management Specialist	1	8	Bachelor's degree in water resources, environment, biology or related field	10 years' experience in watershed management, reforestation, soil and water conservation.	
4	Economist & Financial Specialist	1	8	Bachelor's degree in economics,	10 years' experience in conducting project economic and financial	

				finance, or related field	analysis. Working experience in ADB or World Bank projects will be preferred.	
5	Social and Community Development Specialist	1	24	Bachelor's degree in sociology or related field	10 years' experience in social and community development in irrigation projects in rural areas of Pakistan. Experience with ADB or World Bank projects will be preferred.	
6	Resettlement Specialist	1	12	Bachelor's degree in sociology or related field	10 years' experience in land acquisition and resettlement in large water sector projects. Working experience in ADB or World Bank projects will be preferred.	
7	Environmental Specialist	1	24	Bachelor's degree in environmental science/engineering, or related field	10 years' experience in conducting environmental impact assessment and management in large water sector projects. Working experience in ADB or World Bank projects will be preferred.	
8	Resident Engineers	several	240	Bachelor's degree in engineering or related field	10 years' experience in design and construction supervision of large dam/reservoir or irrigation projects.	
9	Design Engineers (Hydraulic/Irrigation / Geotechnical)	several	72	Bachelor's degree in civil engineering or related field	7 years' experience in design and construction of dam/reservoir and irrigation projects.	
10	Groundwater Specialist	1	12	Bachelor's degree in hydrology or related field	7 years' experience in groundwater monitoring and management.	
11	GIS Expert	1	12	Bachelor's degree in geography or related field	7 years' experience in the use of GIS programs and remote sensing including digitizing mapping and data preferably in management or a related field	
12	Site Supervision Engineers (civil. Mechanical, quality control, geotechnical)	various	300	Bachelor's degree in engineering or related field	7 years' experience in design and construction supervision of dam/reservoir and irrigation projects.	
13	Finance / Accounts Manager	several	60	Bachelor's degree in finance, accounting or related field	7 years' experience in financial management, accounting and/or audit.	
14	Material Engineer	several	36	Bachelor's degree in material science or related field	7 years' experience in managing and controlling construction material for large dam/reservoir and irrigation projects.	
15	Social/Community Organizers (male / female)	various	150	Bachelor's degree in sociology or	7 years' experience in mobilizing and organizing rural communities in similar	Also work for PMO and

				related field	cultural environment for the development and implementation of irrigation or agriculture projects.	PIO and their field offices
16	Operation and Maintenance Specialist	2	24	Bachelor's degree in civil engineering or related field	7 years' experience in cost recovery, operation and maintenance of irrigation systems in similar regions.	
17	Survey Engineers	several	40	Bachelor's degree in civil engineering or related field	7 years' experience in conducting topographic surveys and geotechnical investigations for large dam/reservoir and irrigation projects.	
	Subtotal B2		1,042			
	Subtotal (B1+B2)		1,174			
	Total (A+B)		1,474			