



Report and Recommendation of the President to the Board of Directors

Project Number: 48098-002
August 2018

Proposed Loan and Administration of Grants and Technical Assistance Grant Islamic Republic of Pakistan: Balochistan Water Resources Development Sector Project

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Asian Development Bank

CURRENCY EQUIVALENTS

(as of 17 July 2018)

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

ABBREVIATIONS

ACD	–	Agriculture and Cooperatives Department
ADB	–	Asian Development Bank
EIA	–	environmental impact assessment
EIRR	–	economic internal rate of return
EMP	–	environmental management plan
GOB	–	Government of Balochistan
ha	–	hectare
IEE	–	initial environmental examination
IWRM	–	integrated water resources management
JFPR	–	Japan Fund for Poverty Reduction
m ³	–	cubic meter
O&M	–	operation and maintenance
PAM	–	project administration manual
TA	–	technical assistance
WRIS	–	water resources information system

NOTE

In this report, "\$" refers to United States dollars.

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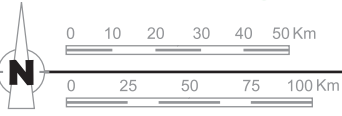
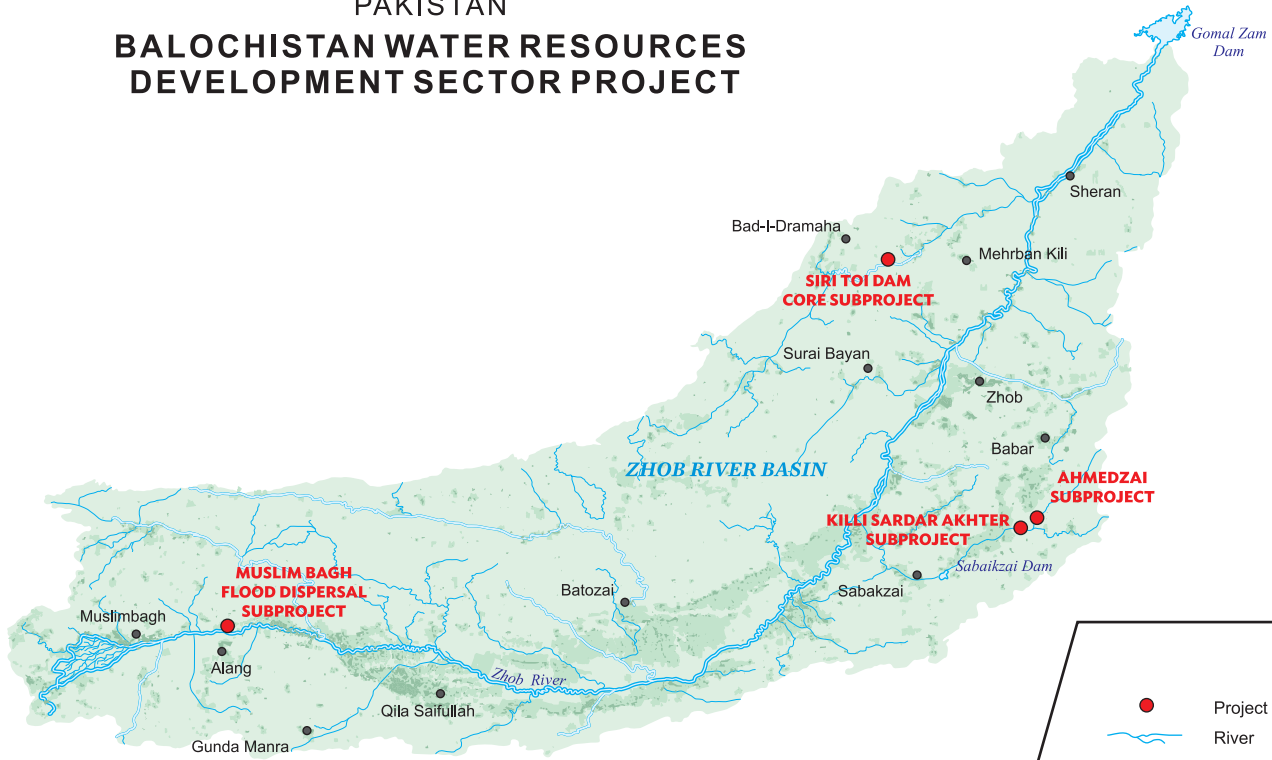
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PROJECT AT A GLANCE

1. Basic Data		Project Number: 48098-002	
Project Name	Balochistan Water Resources Development Sector Project	Department /Division	CWRD/CWER
Country	Pakistan	Executing Agency	Irrigation Department, Government of Balochistan
Borrower	Pakistan		
2. Sector	Subsector(s)	ADB Financing (\$ million)	
✓ Agriculture, natural resources and rural development	Irrigation		70.00
	Land-based natural resources management		10.00
	Rural flood protection		10.00
	Water-based natural resources management		10.00
	Total		100.00
3. Strategic Agenda	Subcomponents	Climate Change Information	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Climate Change impact on the Project	High
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns	ADB Financing	
	Natural resources conservation	Adaptation (\$ million)	2.53
4. Drivers of Change	Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Institutional development	Effective gender mainstreaming (EGM)	✓
Partnerships (PAR)	Civil society organizations Implementation		
5. Poverty and SDG Targeting		Location Impact	
Geographic Targeting	Yes	Rural	High
Household Targeting	No		
SDG Targeting	Yes		
SDG Goals	SDG6		
6. Risk Categorization:	Complex		
7. Safeguard Categorization	Environment: A Involuntary Resettlement: B Indigenous Peoples: C		
8. Financing			
Modality and Sources		Amount (\$ million)	
ADB		100.00	
Sovereign Project (Concessional Loan): Ordinary capital resources		100.00	
Cofinancing		5.00	
High Level Technology Fund - Project grant (Full ADB Administration)		2.00	
Japan Fund for Poverty Reduction - Project grant (Full ADB Administration)		3.00	
Counterpart		31.14	
Government		31.14	
Total		136.14	
Note: An attached technical assistance will be financed on a grant basis by the Japan Fund for Poverty Reduction in the amount of \$2,000,000.			

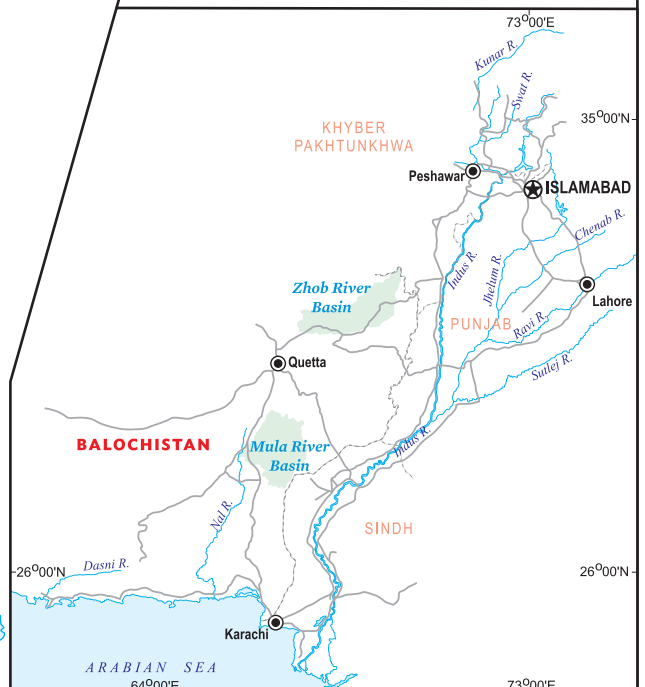
PAKISTAN BALOCHISTAN WATER RESOURCES DEVELOPMENT SECTOR PROJECT



● The project also includes two farmer-managed irrigation subprojects, which cannot be shown on the map because of their multiple locations

- Project Location
 - River
 - River Basin
 - Irrigation
 - Settlement
 - ★ National Capital
 - Provincial Capital
 - City/Town
 - National Highway
 - Provincial Boundary
- Boundaries are not necessarily authoritative.

This map was produced by the cartography unit of the Asian Development Bank. The boundaries, colors, denominations, and any other information shown on this map do not imply, on the part of the Asian Development Bank, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries, colors, denominations, or information.



I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the Islamic Republic of Pakistan for the Balochistan Water Resources Development Sector Project. The report also describes the proposed (i) administration of a grant to be provided by the Japan Fund for Poverty Reduction (JFPR) and administration of a grant to be provided by the High-Level Technology Fund,¹ both for the Balochistan Water Resources Development Sector Project; and (ii) administration of technical assistance (TA) to be provided by JFPR for Climate-Resilient Water Resources Management, and if the Board approves the proposed loan, I, acting under the authority delegated to me by the Board, approve the administration of the grants and the TA.

2. The proposed project will be implemented in the Zhob and Mula river basins in Balochistan Province. The project will improve (i) land and water resources management and agricultural productivity and farm income in Balochistan and (ii) the institutional capacity of the Government of Balochistan (GOB) to implement its integrated water resources management (IWRM) policy.²

II. THE PROJECT

A. Rationale

3. **Poverty.** Balochistan is Pakistan's largest province, with a land area of 347,190 square kilometers. It is also the poorest. A multidimensional index estimated Balochistan's poverty rate at about 71.2% during 2014–2015, compared with 38.8% for Pakistan as a whole.³ Poverty in Balochistan is a rural phenomenon. Limited water resources, lack of off-farm employment opportunities, extreme weather conditions, and inefficient and highly unequal use of land and water resources are the main factors contributing to high poverty levels in the province.

4. **Agriculture and water scarcity.** Agriculture is the backbone of Balochistan's economy. About 75% of the population lives in rural areas and depends mainly on agriculture. The agriculture sector accounts for about two-thirds of the gross provincial domestic product and about 60% of the labor force. Because of the province's arid climate and severe overgrazing, much of Balochistan's land is rugged desert or low-grade rangeland. Only about 2.5 million hectares (ha), or about 7.2% of the total land area, are under cultivation, with both *kharif* (spring) and *rabi* (winter) crops grown seasonally throughout the year. Balochistan is the least water-secure province in Pakistan and water, not land, is usually the main factor limiting agricultural productivity and farm income growth. Its water resources comprise groundwater (4%), water share from the Indus Basin (39%), and floodwater (57%). Agriculture accounts for 93% of total water use in Balochistan, where water availability per ha per year averages 560 cubic meters (m³), much lower than the 2,500 m³ average in Pakistan's three other provinces. In Balochistan, floodwater has greater development potential as only 40% is used for irrigation and the rest flows down to the sea.⁴

¹ Financing partner: the Government of Japan.

² GOB, Department of Irrigation and Power. 2006. *Integrated Water Resources Management Policy Balochistan: Approved Policy Document*. Quetta. The policy was prepared under TA for Supporting Public Resource Management Reforms in Balochistan financed by the Asian Development Bank (ADB) (ADB. 2004. *Report and Recommendation of the President to the Board of Directors: Proposed Loans and Technical Assistance Grants to the Islamic Republic of Pakistan for the Balochistan Resource Management Program*. Appendix 8. Manila).

³ Government of Pakistan, Planning Commission. 2016. *Multidimensional Poverty in Pakistan*. Islamabad.

⁴ R. Benmessaoud. 2013. *Islamic Republic of Pakistan—Balochistan: Development Issues and Prospects, Part II – Water and Agriculture*. Washington, DC: World Bank. Floodwater mainly includes *sailaba* (spate irrigation) and *khushkaba* (rainwater harvesting).

5. **Irrigation.** Irrigation plays a vital role in Balochistan's agriculture. The uncertain and erratic nature of rainfall within a year, and the variations from year to year, cause difficulties in predicting rainfall quantity and scheduling irrigation. The perennial irrigation infrastructure has deteriorated and requires rehabilitation. The province has an irrigated area of about 1.09 million ha, about 3.2% of its total land area, of which about half is irrigated with perennial sources and the rest with groundwater.⁵ In addition, harvested rainfall, runoff, and floodwater diversion techniques are used to cultivate land, but they are poorly managed, inefficient, and unproductive. These structures cannot manage large flood flows. Permanent headworks that can effectively regulate high flood flows or dams that can store and enable the timely release of water for downstream agricultural purposes can significantly improve agricultural productivity, enhance rural livelihoods, and improve food security.

6. **Watershed management.** Balochistan's watershed resources have come under rising pressure from anthropogenic stresses such as uncontrolled grazing and excessive clearing of land for cultivation. The rapid proliferation of tube wells is lowering the water table in some districts as well. This worsening situation is affecting not only the overall sustainability of watershed resources, but also the poor who depend heavily on the resource base for their livelihoods.

7. **Climate change.** Future climate change scenarios project annual mean temperatures to increase by about 4°C and annual mean precipitation to increase slightly toward the end of the century in Pakistan, causing more frequent and severe flood and drought events. These changes are expected to increase water demand and worsen water security in the province. Pakistan's capacity to store freshwater is among the lowest in the region, worsening climate change risks to the agricultural economy. The country's dam storage as a percentage of total renewable water resources is 11.3%, slightly lower than India's (11.7%), but significantly lower than in many other countries such as the People's Republic of China (29.2%) and the United States (24.0%).⁶ Measures to adapt to potential climate changes include the modernization of irrigation infrastructure, expansion of water storage, introduction of water-saving technologies, improvement of watersheds, and introduction of drought-resilient crops.⁷

8. **Institution.** Since the approval of the IWRM policy (footnote 2) in 2006, Balochistan has made progress toward effective water resources management, but remains constrained by the lack of appropriate national and provincial institutional frameworks, coordination between provincial institutions, and sharing of responsibilities in the field. Lack of technical and policy capacity within government agencies is also a major concern in IWRM policy implementation.

9. **Strategic fit.** The project aligns with the national government's Vision 2025, which aims to accelerate and sustain economic growth with a focus on improving productivity, to which agriculture is a key contributor.⁸ The project conforms to the country partnership strategy, 2015–2019 of the Asian Development Bank (ADB) for Pakistan, which prioritizes the promotion of better water resource management and irrigation to improve agricultural productivity, increase farm incomes, and ensure food security.⁹ It also conforms to ADB's Water Operational Plan, 2011–2020, which aims to increase water use efficiency and promote IWRM.¹⁰

⁵ GOB, Bureau of Statistics. 2015. Agriculture Sector. *Development Statistics of Balochistan, 2014–15*. Quetta.

⁶ ADB. 2017. *A Region at Risk: The Human Dimensions of Climate Change in Asia and Pacific*. Manila.

⁷ ADB. 2017. *Climate Change Profile of Pakistan*. Manila.

⁸ Government of Pakistan. Planning Commission. 2014. *Pakistan 2025: One Nation, One Vision*. Islamabad.

⁹ ADB. 2015. *Country Partnership Strategy: Pakistan, 2015–2019*. Manila.

¹⁰ ADB. 2012. *Water Operational Plan, 2011–2020*. Manila.

10. **Lessons learned.** ADB, Japan International Cooperation Agency, and the World Bank are Pakistan's major development partners in agriculture and natural resources. The project design has incorporated these partners' experiences and lessons in Balochistan and elsewhere in Pakistan. A key lesson is to support irrigation command area development along with investments in water infrastructure to ensure that economic benefits reach farmers and to motivate beneficiaries to take on operational responsibility. Other key lessons include the need for (i) resource provision so that the participatory approach, including extensive community mobilization and preparation, can develop strong beneficiary ownership; (ii) up-front capacity building and institutional strengthening of government agencies; and (iii) simplicity in project design and implementation.

11. **Value added by ADB assistance.** The project will support IWRM policy implementation and will support and strengthen the principles of ADB's Water Policy,¹¹ including (i) improving water use and delivery efficiency; (ii) fostering water conservation and the sustainability of infrastructure; and (iii) improving governance through beneficiary participation and capacity building. The project will help (i) establish a water resources information system (WRIS) to improve water resources management and monitoring using high-level technology, such as remote sensing and satellite, for river basin modeling and the identification of degraded lands for rehabilitation; and (ii) address watershed degradation by undertaking structural and nonstructural interventions to reduce soil erosion in critical areas through integrated and participatory water management approaches. The project will support high-value agriculture, which is essential to improving farmers' income in Balochistan. These aspects are an integral part of the project design and will help achieve benefits that would not be possible through infrastructure investments alone.

12. The project design explicitly recognizes the institutional, social, and cultural barriers to women's empowerment and their possible impact on women's access to and participation in water resources development activities; and has incorporated gender-specific interventions. The project will mobilize female social organizers at its field offices to implement the interventions and assess the interventions' effects on women.

13. **Sector lending.** The project will use the sector lending modality to provide flexibility to reprioritize and expand interventions during implementation. The GOB's IWRM policy provides a comprehensive framework for the province to address water management and development, including irrigation. The project will finance irrigation development and rehabilitation schemes in line with the GOB's IWRM policy and irrigation sector development plan. It will include development measures to strengthen the GOB's irrigation and agriculture departments' capacity to implement the IWRM policy and sector development plan.

14. During project preparation, the project preparation consultants and the GOB first selected the Zhob and Mula river basins based on the GOB's priority and water and land availability; and then chose 11 out of more than 300 long-listed subprojects in the two river basins as candidate subprojects for possible ADB financing under the project based on criteria such as water and land availability, economic viability, and a balanced approach to extending development support to a geographically wider spread in the selected basins.¹²

¹¹ ADB. 2003. *Water for All: The Water Policy of the Asian Development Bank*. Manila.

¹² ADB provided project preparatory TA for Balochistan Water Resources Development (TA 8800), which assessed the project's environmental, social, economic and financial, and technical viabilities.

B. Impacts and Outcome

15. The project is aligned with the following impacts: farm income increased and water resources management improved in Balochistan.¹³ The project will have the following outcome: agricultural productivity in the project area increased.¹⁴

C. Outputs

16. **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 36 million m³, including a spillway and a water intake;¹⁵ (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.

17. **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.

18. 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 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.

19. **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.

¹³ GOB, Chief Minister's Policy Reform Unit. 2014. *Proposed Balochistan Development Vision and Strategy: Concept Note*. Quetta; and GOB, Department of Irrigation and Power. 2006. *Integrated Water Resources Management Policy Balochistan: Approved Policy Document*. Quetta.

¹⁴ The design and monitoring framework is in Appendix 1.

¹⁵ Siri Toi is also spelled as Sri Toi locally.

D. Summary Cost Estimates and Financing Plan

20. The project is estimated to cost \$136.14 million (Table 1). Detailed cost estimates by expenditure category and by financier are included in the project administration manual (PAM).¹⁶

21. The government has requested a concessional loan of \$100 million from ADB's ordinary capital resources to help finance the project. The loan will have a 25-year term, including a grace period of 5 years; an interest rate of 2% per year during the grace period and thereafter; and such other terms and conditions set forth in the draft loan and project agreements.

Table 1: Summary Cost Estimates
(\$ million)

Item	Amount ^a
A. Base Cost^b	
1. Irrigation infrastructure and watershed protection constructed and/or rehabilitated	89.29
2. Command area established and/or improved	15.26
3. Institutional capacity strengthened	10.75
Subtotal (A)	115.30
B. Contingencies^c	15.42
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 works, goods, and services. Price contingencies computed at 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% per year during implementation.

Source: Asian Development Bank estimates.

22. The summary financing plan is in Table 2. ADB will finance the expenditures in relation to civil works, goods, consulting services, recurrent project management costs, and financial charges during implementation. The JFPR will provide contractual parallel grant cofinancing equivalent to \$3 million, and the High-Level Technology Fund will provide contractual parallel grant cofinancing equivalent to \$2 million, both to be fully administered by ADB.¹⁷ The GOB will finance taxes and duties, resettlement, staff salary for project management and implementation, and contingencies. The GOB will provide counterpart funding in a timely manner to satisfy its liabilities arising from any work, goods, and/or consulting service contract, including any additional counterpart funding required for any shortfall of funds or cost overruns.

23. Climate adaptation is estimated to cost \$2.53 million. ADB and ADB-administered fund will finance 100% of the adaptation costs.¹⁸ The climate adaptation measures include additional freeboards for weirs and Siri Toi Dam, increased water storage to use flood water, and improved watershed management such as check dams and tree plantation.

¹⁶ Project Administration Manual (accessible from the list of linked documents in Appendix 2).

¹⁷ The JFPR will finance the pilot testing of a drip irrigation system in about 130 ha of high-value agriculture land under output 2 (para. 18). The High-Level Technology Fund will finance the use of hydrometeorological equipment to monitor water resources under output 3 (para. 19).

¹⁸ Climate Change Assessment (accessible from the list of linked documents in Appendix 2).

Table 2: 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 ^b	3.00	2.2
High-Level Technology Fund ^c	2.00	1.5
Government	31.14	22.9
Total	136.14	100.0

^a The farmer beneficiaries will contribute about \$0.36 million to the pilot test of high-value agriculture under output 2.

^b Administered by the Asian Development Bank.

^c Financing partner: the Government of Japan. Administered by the Asian Development Bank.

Source: Asian Development Bank estimates.

E. Implementation Arrangements

24. The implementation arrangements are summarized in Table 3 and described in detail in the PAM (footnote 16). The GOB, through its Irrigation Department, will be the executing agency of the project. The Agriculture and Cooperatives Department (ACD) will be the implementing agency. The GOB will set up a project steering committee to guide and direct project implementation. The GOB will establish a project management office at the Irrigation Department and a project implementation office at the ACD for day-to-day project management and implementation.

25. Given the Irrigation Department's unfamiliarity with ADB's project consultant selection methods, at the government's request, ADB will recruit the project design, supervision, and implementation support consultants on behalf of the Irrigation Department. The Irrigation Department will retain responsibility for negotiating and signing the contract with the consultants and supervising the consultants' services.

Table 3: Implementation Arrangements

Aspects	Arrangements		
Implementation period	January 2019–December 2023		
Estimated completion date	31 December 2023		
Estimated loan closing date	30 June 2024		
Management			
(i) Oversight body	Project steering committee Additional chief secretary, Planning and Development Department (chair) Secretaries of the departments of finance, planning and development, irrigation, agriculture and cooperatives, livestock and dairy, and forestry and wildlife (members)		
(ii) Executing agency	Government of Balochistan, through the Irrigation Department		
(iii) Key implementing agencies	Agriculture and Cooperatives Department		
(iv) Implementation unit	Project management office, project implementation office, and their relevant field offices		
Procurement ^a	International competitive bidding	2 contracts	\$46.58 million
	National competitive bidding	18 contracts	\$39.84 million
	Shopping	9 contracts	\$0.88 million
	Community participation in procurement	multiple contracts	\$12.09 million
Consulting services ^a	Quality- and cost-based selection (90:10)	About 1,470 person-months	\$6.00 million
	Individual consultant selection	9 person-months	\$0.10 million
Retroactive financing and/or advance contracting	Advance contracting and retroactive financing will be used for (i) project detailed design, construction supervision, and implementation support consulting services; (ii) goods and works; and (iii) provision of training; but not earlier than 12 months		

Aspects	Arrangements
	before the signing of the loan agreement, subject to a maximum amount equivalent to 20% of the loan amount.
Disbursement	The loan and grant proceeds will be disbursed following the Asian Development Bank (ADB) <i>Loan Disbursement Handbook</i> (2017, as amended from time to time) and detailed arrangements agreed between the government and ADB.

^a Universal procurement will apply to the civil works, goods, and consulting services to be financed by ADB and the High-Level Technology Fund. Universal procurement will not apply to the civil works, goods, and consulting services to be financed by JFPR, following Japan's notification to ADB that ADB's member country procurement eligibility restrictions should continue to apply.

Source: Asian Development Bank.

III. ATTACHED TECHNICAL ASSISTANCE

26. Balochistan is highly vulnerable to climate change impacts. The attached TA will help the GOB strengthen the province's institutional capacity to address exposed climate change impacts and risks and to build a climate-resilient and sustainable water resources management mechanism. The TA will have the following outputs: (i) enhanced knowledge and updated policy and regulatory frameworks for improved climate-resilient water resources management; (ii) improved design and functional infrastructure of a WRIS applying satellite remote-sensing technology; and (iii) increased institutional capacity and skills on the efficient use of water for climate-resilient water resources management. ADB will administer the TA and will select, supervise, and evaluate the consultants. The Irrigation Department will be the executing agency for the TA.¹⁹

27. The TA is estimated to cost \$2,350,000, of which \$2,000,000 will be financed on a grant basis by JFPR and administered by ADB. The government will provide counterpart support in the form of counterpart staff, office space, and other in-kind contributions.

IV. DUE DILIGENCE

A. Technical

28. The GOB, with the assistance of the project preparation consultants, selected the candidate subprojects based on a river basins assessment and initial screening. The pre-feasibility studies for all subprojects and feasibility studies for the core subprojects were then conducted, and detailed design will be carried by project design consultants during project implementation. The technical feasibility of the project was confirmed to be adequate after detailed examination of local conditions, including current and projected climate variables, availability of water sources, and land available for project facilities. Based on a climate change risk simulation using the result of global circulation models, the climate risk and vulnerability assessment found the project to be highly at risk from the impact of climate change. The project design incorporated adaptation measures to reduce the risks resulting from increased flood events.

B. Economic and Financial

29. The project will bring three major benefits to a rural population of about 42,900 people. First, farm household income is expected to increase because of increased cropping intensities, higher crop yields, and crop diversification. The analysis of three representative subprojects indicates that incremental household incomes will be \$392–\$3,088 per year depending on the

¹⁹ Attached Technical Assistance Report (accessible from the list of linked documents in Appendix 2).

farm's location in the command area and its current irrigation water supply. Second, incremental crop labor will create full-time rural jobs, most of which will go to local workers from poor households. Third, the project will create more economic opportunities for input suppliers and processors of and market intermediaries for agricultural products in the agricultural supply chain.

30. The economic internal rates of return (EIRRs) for all three core subprojects are greater than the opportunity cost of capital of 9.0%. The EIRRs are 13.9% for the Siri Toi Dam subproject, 14.3% for the Kharzan Hatachi subproject, and 24.4% for the Karkh subproject. Economic viability will be one of the criteria for selecting additional subprojects for financing under the loan. These representative EIRRs suggest that, overall, the project is economically viable. However, EIRRs are highly sensitive to a decrease in and a delay of project benefits. Therefore, it is important that (i) overall project and subproject implementation should be undertaken as scheduled; and (ii) extension service support for command area development, watershed management, and *khushkaba* farming (using localized runoff for irrigation) should be provided by the project in parallel with the civil works to generate benefits without delay.

31. The financial sustainability assessment focused on the operation and maintenance (O&M) requirements. The annual incremental O&M cost in financial terms for the irrigation systems is estimated at PRs118.87 million. To ensure sustainable O&M, the GOB will develop an O&M plan for the irrigation infrastructure and WRIS established under the project. The GOB will be responsible for the O&M of key irrigation infrastructure and the WRIS. Farmer organizations will receive training and O&M manuals to help empower them to take over the O&M of on-farm irrigation structures, mainly by contributing their labor. Policy dialogues with the GOB on conducting irrigation tariff reforms in Balochistan will be continued through the TA (para. 27). During the development of the O&M plan, the Irrigation Department and ADB will reassess and reconfirm the adequacy of the O&M requirements.

C. Governance

32. A financial management assessment and a procurement risk assessment were conducted for the Irrigation Department as the executing agency and the ACD as the implementing agency of the project and the grants. The financial management assessment concluded that the pre-mitigation risk is *substantial*. Key risks include: (i) financial management staff are not familiar with ADB's financial management requirements and procedures; (ii) expenditure incurred will not follow the applicable legal framework; and (iii) information systems are lacking, which may result in inaccurate and delayed reporting. An action plan was agreed with the Irrigation Department and the ACD to address the deficiencies and enhance their financial management.

33. The procurement risk assessment concluded that the general environment for procurement is satisfactory, but the main weaknesses include Irrigation Department and ACD's (i) inadequate experience with externally financed projects, and (ii) unfamiliarity with ADB procurement procedures and requirements. The GOB and ADB have prepared a capacity development plan, including training and consulting services, for the Irrigation Department and the ACD for improved financial management, procurement, implementation capacity, and institutional reforms.

34. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the Government of Pakistan and the GOB. The specific policy requirements and supplementary measures are described in the PAM.

D. Poverty, Social, and Gender

35. A poverty, social, and gender assessment was conducted by the project preparation consultants during project preparation and the project has built several measures for social inclusion and rural residents' improved living standards, including (i) establishing a command area for rural villages and the poor; (ii) involving local communities in project design and implementation; and (iii) providing targeted training for local people, especially for the poor and women.

36. Extensive consultations with local communities were conducted during project preparation and incorporated their feedback in the project design. Further consultations will be undertaken by ADB and GOB during detailed design and implementation to ensure that local people can participate in and benefit from relevant project activities.

37. The project is classified *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 include: (i) 30% of the consultations during subproject design and construction are with women's groups; (ii) 30% of the subprojects have facilities for women's increased access to water for domestic use, such as washing facilities and water collection points; (iii) awareness sessions are conducted on safe drinking water practices, nutritional value of food, and waterborne diseases for women and girls; (iv) 200 women and girls are trained in kitchen gardening skills; (v) at least 250 women are trained in income-generating high-value agribusinesses; (vi) at least 22 women-led small-scale income-generating agribusinesses are launched; and (vii) a social and gender officer is hired at the project management office.

E. Safeguards

38. In compliance with ADB's Safeguard Policy Statement (2009), the project's safeguard categories are as follows.²⁰

39. **Environment (category A).** A draft environmental impact assessment (EIA) for the Siri Toi Dam subproject and a draft consolidated initial environmental examination (IEE) report, including environmental management plans (EMPs), for the Karkh River Development Schemes and the Kharzan Hatachi Infiltration Gallery subprojects were prepared following ADB's Safeguard Policy Statement. An environmental assessment and review framework was prepared to provide guidance for screening and preparing EIAs or IEEs and EMPs for noncore subprojects during project implementation, to ensure compliance with ADB policies and Pakistan's laws and regulations. Stakeholder consultations for the Siri Toi Dam, Karkh River Development Schemes, and Kharzan Hatachi Infiltration Gallery subprojects were carried out in May 2017. ADB disclosed the EIA on ADB's website on 2 February 2018, the IEE on 13 February 2018, and the environmental assessment and review framework on 7 March 2018. The EIA for the Siri Toi Dam subproject concluded that it will bring mostly positive changes in the physical, biological, and socioeconomic environments. However, cut-and-fill operations during construction can cause soil erosion and surface water and air pollution, and the use of fertilizers and pesticides during operations can contaminate the groundwater. There is also a risk of breaching of the dam because of natural hazards. These risks have been considered and will address them in the detailed project designs, which independent consultants will review before construction. The Irrigation Department, with the help of the consultants, will also prepare an emergency response plan for

²⁰ ADB. Safeguard Categories. <https://www.adb.org/site/safeguards/safeguard-categories>.

potential dam failure. Adequate mitigation measures are included in, and will be implemented through, the EMPs. The executing agency, the design and supervision consultants, and the construction contractors will hire dedicated environmental staff during various project phases to ensure effective implementation of the EMP and other environmental requirements. The Irrigation Department will also hire a third-party environmental monitoring consultant during the construction stage of the Siri Toi Dam subproject to carry out external monitoring of EMP implementation. ADB, through the environmental staff and consultants, will also provide training to the project environmental staff on overcoming any deficiency in the effective implementation of the EMP and other environmental requirements.

40. **Involuntary resettlement (category B).** All 11 subprojects were preliminarily screened for involuntary resettlement at the project preparatory TA stage. Based on this preliminary screening, only the Siri Toi Dam subproject was assessed as having involuntary resettlement impacts. The proposed engineering works for the remaining subprojects involve the rehabilitation of existing irrigation infrastructure and are restricted to the existing available rights-of-way. The Irrigation Department prepared a resettlement plan for the Siri Toi Dam subproject with the assistance of consultants following ADB's Safeguard Policy Statement. About 311.15 ha of land will be permanently affected, of which 293.53 ha are unsettled land that is considered state land. About 17.44 ha are settled land belonging to 142 landowners. Land needed for tertiary canals and/or watercourses will be determined at a later stage as part of command area development; beneficiaries will provide the land for tertiary canals as their counterpart contribution to the subproject. The lands to be acquired are mostly barren and have no current economic activity. No impact on crops, trees, and structures have been identified. Affected entities include 142 households with plots on settled land and two clans (Ahmadkhel Karezai and Irabzai) with customary claim to land needed for the Siri Toi Dam and the irrigation canals. No household or person is expected to lose 10% or more of productive land or be physically displaced from housing. A resettlement framework was prepared to provide guidance for screening and preparing a resettlement plan for the noncore subprojects with resettlement impacts and unanticipated and emerging impacts during project implementation, to ensure compliance with ADB policies and Pakistan's laws and regulations. The project will strengthen the capacity of the Irrigation Department and the ACD to implement the resettlement plan in line with ADB's requirements. ADB disclosed the resettlement framework and the land acquisition and resettlement plan on ADB's website on 26 February 2018.

41. **Indigenous peoples (category C).** All 11 subprojects were preliminarily screened for indigenous peoples safeguards during project preparation. No indigenous peoples are present in the subproject areas, as defined by ADB's Safeguard Policy Statement. The project will not affect any indigenous communities, so no indigenous peoples planning document is required.

F. Summary of Risk Assessment and Risk Management Plan

42. Significant risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.²¹

²¹ Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigation Measures
Financial management staff is not familiar with the financial management requirements and procedures of the Asian Development Bank (ADB).	The project will provide training to relevant financial management staff. The project management office (PMO) and the project implementation office (PIO) will recruit financial management consultants to help improve their financial management.
Expenditure incurred does not comply with the applicable legal framework.	A comprehensive section in the financial management manual describes stepwise guidance on expenditure management, defining the service standards and prerequisite supporting documentation for payment processing.
Security situation in the project area deteriorates to a level that does not allow work on contracts.	The Government of Balochistan (GOB) and local governments will provide protection measures to ensure the security of project contractors and consultants during project implementation.
The PMO and the PIO are not familiar with ADB's procurement requirements and procedures.	The project will provide training to relevant staff and will recruit procurement consultants to assist the PMO and the PIO in conducting procurement and contract management.
Climate change may reduce water availability for agriculture.	The project design is geared toward climate resilience. Each component incorporates adaptation measures such as watershed protection, water storage structure, groundwater recharge, and use of water-saving irrigation technologies.
Unsustainable operation and maintenance (O&M) of infrastructure components may occur because of lack of capacity or budget.	The GOB is committed to developing an O&M plan and allocating an adequate budget for O&M, as covenanted in the loan and project agreements. The project will also help empower farmer communities, by providing training and O&M manuals, to take over the O&M of small irrigation facilities and on-farm irrigation management. Policy dialogues with the GOB will be continued for adopting irrigation tariff reforms.

Source: Asian Development Bank.

V. ASSURANCES

43. The Government of Pakistan and the GOB have assured ADB that implementation of the project shall conform to all applicable ADB policies, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the PAM and loan documents.

44. The Government of Pakistan and the GOB have agreed with ADB on certain covenants for the project, which are set forth in the draft loan agreement, grant agreements, and project agreement.

VI. RECOMMENDATION

45. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of \$100,000,000 to the Islamic Republic of Pakistan for the Balochistan Water Resources Development Sector Project, from ADB's ordinary capital resources, in concessional terms, with an interest charge at the rate of 2% per year during the grace period and thereafter; for a term of 25 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and project agreements presented to the Board.

Takehiko Nakao
President

2 August 2018

DESIGN AND MONITORING FRAMEWORK

Impacts 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 Mechanisms	Risks
Outcome Agricultural productivity in the project area increased	By 2024 a. In Zhob river basin, crop yield increased to 5,400 kg/ha for apricots, 2,500 kg/ha for wheat, 8,900 kg/ha for hybrid maize (corn), and 10,500 kg/ha for winter fodders (2014 baseline: 4,500 kg/ha for apricots, 2,031 kg/ha for wheat, 7,413 kg/ha for hybrid maize, and 8,500 kg/ha for winter fodders) b. In Mula river basin, crop yield increased to 3,750 kg/ha for citrus, 2,700 kg/ha for wheat, 1,800 kg/ha for cotton, and 11,000 kg/ha for winter fodders (2014 baseline: 3,000 kg/ha for citrus, 2,224 kg/ha for wheat, 1,277 kg/ha for cotton, and 9,000 kg/ha for winter fodders)	a–b. GOB's yearly agriculture survey 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 which 30% have facilities for women's increased access to water for domestic use (2017 baseline: 0) 1b. 276 km long 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. Groundwater table monitoring in the project area conducted and reported (2017 baseline: not applicable) 2a. About 11,603 ha of land improved and served by constructed or rehabilitated irrigation and <i>khushkaba</i> (rainwater harvesting) infrastructure (2017 baseline: 0) 2b. About 5,989 ha of land developed under new irrigation infrastructure (2017 baseline: 0) 2c. About 130 ha of high-value agriculture land pilot tested with drip irrigation system through the JFPR grant (2017 baseline: 0) 2d. At least 22 women-led small-scale agribusinesses launched (2017 baseline: 0)	1a–d. PMO's quarterly progress and completion reports, and ADB loan review missions 2a–d. PMO's quarterly progress and completion reports, and ADB loan review missions	Security situation in the project area deteriorates to a level that does not allow work on contracts.

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
3. Institutional capacity strengthened	<p>3a. WRIS established and operational through technical assistance (2017 baseline: not applicable)</p> <p>3b. High-level technology hydrometeorological equipment used in the field validation of satellite-based WRIS data for monitoring of water resources in three river basins under the High-Level Technology Fund grant (2017 baseline: not applicable)</p> <p>3c. At least 40 trained staff from the Irrigation Department, the ACD, and the PMO and/or the PIO, of whom 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 in the efficient use of water and value-added farming; and at least 250 women trained in income-generating high-value agribusinesses (2017 baseline: not applicable)</p>	3a–d. PMO's quarterly progress and completion reports, and ADB 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 (Q3 2018–Q3 2019)
- 1.2 Complete resettlement plan update and land acquisition (Q3 2018–Q4 2019)
- 1.3 Advertise the Siri Toi Dam construction package through international competitive bidding (Q3 2019)
- 1.4 Conduct procurement of civil works and equipment (Q4 2018–Q1 2020)
- 1.5 Award contracts for irrigation infrastructure, including dams, canals, and other structures (Q4 2018–Q4 2019)
- 1.6 Complete civil works construction and equipment installation, including dams, canals, and other structures (Q4 2018–Q4 2023)
- 1.7 Complete watershed protection measures (Q4 2018–Q4 2023)

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 in the 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 fruit, vegetable, and olive oil processing units (Q4 2019–Q1 2022)
- 2.8 Establish 22 women-led small-scale agribusinesses (Q4 2019–Q1 2022)

3. Institutional capacity strengthened

- 3.1 Recruit consultants for detailed design, construction supervision, and implementation support (Q3 2018–Q1 2019), including advertising the package through advance action (Q2 2018)
- 3.2 Conduct training for the Irrigation Department, the ACD, the PMO, and the PIO on project management and implementation (Q3 2018–Q4 2023)
- 3.3 Conduct training for farmers on 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 consultants for the development of the WRIS, supported by technical assistance (Q4 2018–Q3 2020)
- 3.6 Develop the WRIS (Q3 2019–Q3 2022)
- 3.7 Conduct test and trial operation of the WRIS and provide necessary training to relevant staff (Q3 2022–Q4 2023)

<p>Project Management Activities Carry out key activities of the GAP and the social development action plan (Q1 2019–Q4 2023) Conduct and monitor activities of the resettlement plan, including land acquisition, and the 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)</p>
<p>Inputs ADB: \$100.00 million (concessional OCR loan) Government: \$31.14 million JFPR: \$3.00 million (grant) High-Level Technology Fund: \$2.00 million (grant)</p>
<p>Assumptions for Partner Financing Not applicable</p>

ACD = Agriculture and Cooperatives Department, ADB = Asian Development Bank, GAP = gender action plan, GOB = Government of Balochistan, ha = hectare, JFPR = Japan Fund for Poverty Reduction, kg = kilogram, km = kilometer, OCR = ordinary capital resources, PIO = project implementation office, PMO = project management office, Q = quarter, WRIS = water resources information system.

^a GOB, Chief Minister's Policy Reform Unit. 2014. *Proposed Balochistan Development Vision and Strategy: Concept Note*. Quetta.

^b GOB, Department of Irrigation and Power. 2006. *Integrated Water Resources Management Policy Balochistan: Approved Policy Document*. Quetta.

Source: Asian Development Bank estimates.

LIST OF LINKED DOCUMENTS

<http://www.adb.org/Documents/RRPs/?id=48098-002-3>

1. Loan Agreement
2. Grant Agreement: Japan Fund for Poverty Reduction
3. Grant Agreement: High-Level Technology Fund
4. Project Agreement
5. Sector Assessment (Summary): Agriculture, Natural Resources, and Rural Development
6. Project Administration Manual
7. Contribution to the ADB Results Framework
8. Development Coordination
9. Economic and Financial Analysis
10. Country Economic Indicators
11. Summary Poverty Reduction and Social Strategy
12. Risk Assessment and Risk Management Plan
13. Attached Technical Assistance Report
14. Japan Fund for Poverty Reduction Grant
15. Climate Change Assessment
16. Gender Action Plan
17. Environmental Impact Assessment: Siri Toi Dam Subproject
18. Initial Environmental Examination: Karkh River Development Schemes and Kharzan Hatachi Infiltration Gallery Subprojects
19. Environmental Assessment and Review Framework
20. Resettlement Plan: Siri Toi Dam Subproject
21. Resettlement Framework

Supplementary Documents

22. Procurement Risk Assessment
23. Financial Management Assessment
24. Detailed Economic and Financial Analysis
25. Climate Risk and Vulnerability Analysis Report