



Report and Recommendation of the President to the Board of Directors

Project Number: 47181-003
Grant Number: 0498/9188-TAJ
May 2018

Proposed Grant and Administration of Grant for Additional Financing Republic of Tajikistan: Water Resources Management in the Pyanj River Basin Project

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Asian Development Bank

CURRENCY EQUIVALENTS

(as of 30 April 2018)

Currency unit – somoni (TJS)

TJS1.00 = \$0.1125

\$1.00 = TJS8.8884

ABBREVIATIONS

ADB	–	Asian Development Bank
ALRI	–	Agency for Land Reclamation and Irrigation
CIS	–	Chubek Irrigation System
GCF	–	Green Climate Fund
Hydromet	–	State Agency for Hydrometeorology of Tajikistan
MEWR	–	Ministry for Energy and Water Resources
O&M	–	operation and maintenance
PIC	–	project implementation consultant
PIG	–	project implementation group
PRB	–	Pyanj River Basin
SPS	–	Safeguard Policy Statement
WRM	–	water resources management

NOTE

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

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CONTENTS

	Page
PROJECT AT A GLANCE	
I. THE PROPOSAL	1
II. THE PROJECT	1
A. Rationale	1
B. Impact and Outcome	4
C. Outputs	4
D. Investment and Financing Plans	5
E. Implementation Arrangements	7
III. DUE DILIGENCE	8
A. Technical	8
B. Economic and Financial	8
C. Governance	8
D. Poverty and Social	9
E. Safeguards	9
F. Risks and Mitigating Measures	9
IV. ASSURANCES	10
V. RECOMMENDATION	10
APPENDIXES	
1. Revised Design and Monitoring Framework	11
2. List of Linked Documents	16

PROJECT AT A GLANCE

1. Basic Data		Project Number: 47181-003	
Project Name	Water Resources Management in the Pyanj River Basin Project (Additional Finance)	Department /Division	CWRD/CWER
Country Borrower	Tajikistan Ministry of Finance	Executing Agency	State Agency for Hydrometeorology (Hydromet)
2. Sector	Subsector(s)	ADB Financing (\$ million)	
✓ Agriculture, natural resources and rural development	Rural flood protection		1.30
	Rural water policy, institutional and capacity development		3.90
	Water-based natural resources management		1.30
		Total	6.50
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	Medium
Environmentally sustainable growth (ESG)	Disaster risk management Global and regional transboundary environmental concerns		
4. Drivers of Change	Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Institutional development	Effective gender mainstreaming (EGM)	✓
Knowledge solutions (KNS)	Knowledge sharing activities		
Partnerships (PAR)	Official cofinancing United Nations organization		
5. Poverty and SDG Targeting		Location Impact	
Geographic Targeting	Yes	Rural	High
Household Targeting	No	Urban	Low
SDG Targeting	Yes		
SDG Goals	SDG11, SDG13		
6. Risk Categorization:	Low		
7. Safeguard Categorization	Environment: B Involuntary Resettlement: C Indigenous Peoples: C		
8. Financing			
Modality and Sources		Amount (\$ million)	
ADB		6.50	
Sovereign Grant projects: Asian Development Fund		6.50	
Cofinancing		5.00	
Green Climate Fund - Grant projects (Full ADB Administration)		5.00	
Counterpart		1.29	
Government		1.29	
Total		12.79	

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed grant to the Republic of Tajikistan for the additional financing of the Water Resources Management in the Pyanj River Basin Project. The report also describes the proposed administration of a grant to be provided by the Green Climate Fund (GCF) for the additional financing of the Water Resources Management in the Pyanj River Basin Project, and if the Board approves the proposed grant, I, acting under the authority delegated to me by the Board, approve the administration of the grant.

2. The proposed additional financing will expand the scope of the current project to include capacity building and institutional development of the State Agency for Hydrometeorology of Tajikistan (Hydromet) to provide quality climate services for water resources management (WRM), agricultural production, and disaster risk reduction in the Pyanj River Basin (PRB) in southern Tajikistan.¹ The project will address Hydromet's key underlying institutional weaknesses and support its development to a sustainable and well-resourced national agency for meteorology and hydrology.

II. THE PROJECT

A. Rationale

3. Tajikistan is one of the most vulnerable countries in Central Asia to the adverse impacts of climate change, with the water resources and agriculture sectors most affected.² Over 70% of the population lives in rural areas, mostly relying on agriculture production for their livelihoods.³ Among these, the poor are generally most exposed to prevailing climatic conditions and natural hazards. In the period 1990–2016, the country experienced approximately 45 significant climate-related natural disasters, of which 60% were floods. These disasters caused about 500 deaths and \$1.5 billion in damages.⁴ Future climatic changes are expected to exacerbate such events and generate additional negative impacts. Annual and winter mean temperatures in Tajikistan are expected to increase by up to 2 degrees Celsius by 2050 from the 1971–2000 baseline.⁵ Increased temperatures and evapotranspiration may increase irrigation water demand and decrease agricultural yields (footnote 3). Accelerated glacier retreat may increase monthly river flow rates in the medium term, followed by declines in the longer term. Flood events may increase in magnitude and frequency.⁶

4. The Government of Tajikistan has recognized climate change as a key risk to its future development and has prioritized improving resilience and adapting to its adverse impacts. Tajikistan's Nationally Determined Contribution to the Paris Agreement of the United Nations Framework Convention on Climate Change prioritizes reducing the country's vulnerability to

¹ ADB. 2016. *Report and Recommendation of the President to the Board of Directors: Proposed Loan, Grant, and Administration of Grant and Technical Assistance Grant to the Republic of Tajikistan for the Water Resources Management in the Pyanj River Basin Project*. Manila. (L3434-TAJ).

² University of Notre Dame. [Notre Dame Global Adaptation Initiative Country Index](#) (accessed 17 April 2018).

³ World Food Programme. 2017. *Climate Risks and Food Security in Tajikistan: A Review of Evidence and Priorities for Adaptation Strategies*. C-ADAPT Analyses. Rome.

⁴ Centre for Research on the Epidemiology of Disasters. [The International Disaster Database](#) (accessed 17 April 2018).

⁵ M. Punkari et al. 2014. *Climate Change and Sustainable Water Management in Central Asia*. ADB Central and West Asia Working Paper Series. No. 5. Manila: Asian Development Bank (ADB).

⁶ R. J. Murnane, et al. 2016. *Future scenarios for earthquake and flood risk in Eastern Europe and Central Asia*. *Earth's Future*. 5 (7). pp. 693–714; and M. Westphal. 2008. *Summary of Climate Science in the Europe and Central Asia Region: Historical Trends and Future Projections*. Washington, DC: World Bank.

climate change in key areas—agriculture, irrigation, and water resources—through the adoption of new methods and planning and improved hydrometeorological monitoring, among others.⁷ These priorities are also reflected in the forthcoming Tajikistan National Climate Change Adaptation Strategy⁸ and the National Development Strategy to 2030.⁹

5. The Asian Development Bank (ADB) has supported disaster and climate change resilience in water resources and agriculture in Tajikistan since 2006, with a focus on the PRB. The PRB is the Tajikistan's largest river basin. It is economically vital to the country as it includes the majority of Khatlon province, which is the country's most populated and agriculturally productive province. However, districts in the PRB are among the poorest in the country and most exposed and vulnerable to the adverse impacts of climate change.¹⁰ The Khatlon Province Flood Risk Management Project, completed in 2014, and the ongoing Building Climate Resilience in the Pyanj River Basin Project have supported disaster and climate resilience in water resources and agriculture through investments in infrastructure for the most vulnerable districts and capacity building on community disaster preparedness.¹¹

6. The current project continues ADB's support in the PRB by improving the government's WRM capacity and increasing agricultural productivity and water use efficiency in irrigated agriculture (footnote 1). The Ministry of Energy and Water Resources (MEWR) and the Agency for Land Reclamation and Irrigation (ALRI) are the project executing agencies.¹² Under the MEWR-led component, the project will establish river basin organizations and strengthen their capacity for river basin management, including improved monitoring of water use for irrigation. The project will also support Tajikistan's contribution to joint management of the PRB through a joint Afghanistan–Tajikistan Pyanj River Basin commission.¹³ Under the ALRI-led component, the Chubek Irrigation System will be modernized and climate-proofed, including the irrigation and drainage infrastructure and pumping stations. The project will also support capacity building of farmers and water user associations on water use efficiency and agricultural productivity.

7. Timely and accurate reporting, forecasting, and warning of weather, hydrometeorological, and climatic conditions are critical inputs to effective WRM, agricultural production, and disaster risk reduction. ALRI and MEWR's operations rely on the provision of these inputs by the national forecasting entity, Hydromet. The importance of such services will grow under future climatic changes. Market research has revealed interest and willingness to pay among key stakeholders for a broad array of new specialized information services from Hydromet. However, Hydromet is hindered by many of the weaknesses of post-Soviet institutions, including limited budget, decaying infrastructure, and poor staff retention. Consequently, it has insufficient capacity to provide quality services. Its monitoring network is sparse, it has limited forecasting and warning capabilities, and limited resources to improve or develop new outputs to meet users' needs.

⁷ Government of Tajikistan. 2015. Intended Nationally Determined Contribution towards the achievement of the global goal of the UN Framework Convention on Climate Change by the Republic of Tajikistan. Dushanbe.

⁸ ADB. 2017. *Draft National Climate Change Adaptation Strategy*. Consultant's report. Manila. (TA 8090-TAJ).

⁹ Government of Tajikistan. 2016. *National Development Strategy of the Republic of Tajikistan for the Period Up To 2030*. Dushanbe.

¹⁰ ADB. 2011. *Climate Resiliency for Natural Resources Investments*. Consultant's report. Manila. (TA 7599-TAJ).

¹¹ ADB. 2007. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Republic of Tajikistan for the Khatlon Province Flood Risk Management Project*. Manila; and ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Administration of Grant to the Republic of Tajikistan for Building Climate Resilience in the Pyanj River Basin Project*. Manila.

¹² MEWR is responsible for policy and regulations on WRM and ALRI is responsible for WRM infrastructure.

¹³ In parallel, Afghanistan's contribution is supported through the following project: ADB. 2016. *Report and Recommendation of the President to the Board of Directors: Proposed Grant and Administration of Grant to the Islamic Republic of Afghanistan for the Panj–Amu River Basin Sector Project*. Manila. (G0506-AFG)

8. Strengthening the institutional and technical capacity of Hydromet is critical to the country's climate resilience and adaptation efforts. Several externally supported projects have sought to improve Hydromet's capacity in data collection, analysis, and forecasting through investments in training and equipment. The ongoing World Bank Central Asia Hydromet Modernization Project has invested in the monitoring network and short-term weather forecasting.¹⁴ ADB technical assistance for Building Capacity for Climate Resilience is investing in long-term climate change modeling.¹⁵ However, Hydromet still has limited capacity for hydrometeorological monitoring, hydrological modelling, and flood forecasting. In addition, no externally financed projects to date have focused on Hydromet's key underlying institutional weaknesses, which are the source of its problems. Unless these weaknesses are addressed, the sustainability and effectiveness of any capacity-building interventions are likely to be low.

9. The additional financing is needed to expand the scope of the current project to include capacity building and institutional development of Hydromet. The report and recommendation of the President of the current project raised the prospect of additional financing for hydrometeorological monitoring and forecasting (footnote 1). By improving the quality of Hydromet's services to ALRI, MEWR, and other key stakeholders in the PRB, the additional financing will directly support and enhance the outputs of the current project. Improved information delivery, forecasting, and warning by Hydromet will (i) support efficient WRM and agricultural productivity among river basin organizations, water user organizations, and farmers; and (ii) reduce disaster impacts to settlements, water resources infrastructure, and irrigation infrastructure.¹⁶ Engagement between Hydromet and its key users will be strengthened, thereby improving the relevance and utility of its services.

10. Following approval by the ADB Board of Directors on 28 September 2016, the current project was made effective on 8 August 2017 and is performing well based on the following assessment:¹⁷

- (i) **Delivery of expected outputs.** The current project is on track to meet its intended outputs: (a) water resources in the PRB better managed; (b) modernized and climate-proofed Chubek Irrigation System WRM infrastructure fully operational; and (c) farm management capacity and water use skill improved.
- (ii) **Implementation progress.** Following delayed project effectiveness caused by slower than expected internal government approvals, the project is now back on schedule. As of April 2018, cumulative contract awards were \$3.2 million (12% of total) and disbursement was \$1.1 million (4% of total) against 15% elapsed time. Three project implementation consultant (PIC) teams, one for each output, have been recruited and mobilized as of November 2017. Bidding for the major civil works and supply contracts will commence in the second quarter of 2018, with contract award targeted in the fourth quarter of 2018. The project closing date is 30 June 2022.
- (iii) **Safeguard compliance.** The current project is category B for environment and C for involuntary resettlement and indigenous peoples. No significant adverse social or environmental impacts are expected as physical activities are primarily conducted on existing irrigation systems. The project complies with ADB's

¹⁴ World Bank. 2011. *Central Asia Hydromet Modernization Project*. Project appraisal document. Washington, DC.

¹⁵ ADB. 2012. *Technical Assistance to the Republic of Tajikistan for Building Capacity for Climate Resilience*. Manila. (TA8090-TAJ).

¹⁶ Similarly, the additional financing activities could also support the benefits and sustainability of earlier investments in the area (para. 5) and link to future ADB support.

¹⁷ Summary of Project Performance (accessible from the list of linked documents in Appendix 2).

Safeguard Policy Statement (2009, SPS). To date, no physical works have started, and safeguard implementation is on track with no outstanding corrective actions.

- (iv) **Management of risks.** The project has measures to manage risks. The project implementation groups (PIGs) of ALRI and MEWR implement the project activities. The PICs, led by international specialists, support the PIGs in project implementation, including managing technical, financial, and procurement risks.
- (v) **Project performance rating.** The current project performance rating has been *on track* since effectiveness to date.¹⁸

11. Overall, the project is eligible for additional financing. The current project remains technically feasible and is expected to be economically viable and financially sound. Investments in the climate resilience of WRM are a high government priority, in line with climate change adaptation and national development strategies. The current project and proposed additional financing are consistent with the current country partnership strategy.¹⁹

B. Impact and Outcome

12. The impacts of the overall project will be (i) irrigated land in good condition and food security increased (unchanged),²⁰ (ii) the efficiency of water resource use increased (unchanged),²¹ and (iii) climate resilience of agriculture and WRM improved (added).²² The outcome of the overall project will be agricultural productivity and relevance of forecasting services increased in the PRB (changed).²³

C. Outputs

13. The additional financing will expand the scope of the current project output 1 and 3 as follows. The additional financing will not directly contribute to output 2 (Appendix 1).

a. Output 1: Water Resources in Pyanj River Basin Better Managed (unchanged)

14. **Improve forecasting and warning of extreme weather events.** The project will build Hydromet's capacity for flood forecasting and warning in the PRB area. It will install monitoring devices (e.g., river gauges and weather stations) and warning systems, and develop a flood forecasting model for selected pilot areas. Target communities will be consulted and trained in the flood warnings and disaster preparedness. Hydromet staff will be trained in the operation and maintenance (O&M) of the flood forecasting and warning systems.

15. **Modernize Hydromet's operations center.** The project will relocate Hydromet's central operations in Dushanbe from its current dilapidated campus to a new compound in the capital previously allocated to Hydromet. The project will complete the half-finished office building in the compound and install a core information technology system for processing, networking, and data storage. The project will also construct adjacent ancillary buildings including a warehouse,

¹⁸ The project was erroneously rated *potential problem* in eOps in the fourth quarter of 2017 because of a system error.

¹⁹ ADB. 2016. *Country Partnership Strategy: Tajikistan, 2016–2020*. Manila.

²⁰ Aligned with Government of Tajikistan, ALRI. 2016. *Land Reclamation and Irrigation Development Strategy*. Dushanbe.

²¹ Aligned with Government of Tajikistan, MEWR. 2015. *Water Sector Reform Programme for 2016–2025*. Dushanbe.

²² Aligned with Government of Tajikistan. 2015. *Intended Nationally Determined Contribution towards the achievement of the global goal of the UN Framework Convention on Climate Change by the Republic of Tajikistan*. Dushanbe.

²³ The design and monitoring framework is in Appendix 1.

conference facilities, visitor center, archive, and laboratory to enhance Hydromet's functions. Two mixed-use buildings will be constructed on the compound to provide affordable housing for core Hydromet employees, to ensure staff can remain nearby during critical weather events, and to provide an in-kind salary benefit.

16. **Legal and organizational transformation of Hydromet.** The legal status of Hydromet will be updated to that of a state entity with increased management and financial autonomy. Hydromet will remain a public service entity, primarily funded by the government budget, providing forecasts and public information (including critical alerts) free of charge. However, the legal change will allow Hydromet to seek, retain, and use additional commercial revenue to supplement its government budgetary support. Additional revenue sources are expected to include (i) the sale of specialty fee-based information products such as data, and customized forecasts and alerts; (ii) rental of facilities such as office and conference space on commercial terms; and (iii) consulting and other technical advisory services. The project will provide capacity building to Hydromet staff on strategy, management, administration, and control in line with its updated legal framework. The project will develop a strategic O&M plan, including annually updated budget forecasts. The project will support knowledge sharing events between Hydromet with other national hydrometeorological (or related) agencies in the region.

b. Output 3: Farm Management Capacity and Water Use Skill Improved (unchanged)

17. **Fee-based information services.** The project will support the provision of additional specialty fee-based information products to supplement Hydromet's free-of-charge core public service outputs. Such products may include historical datasets, focused daily or weekly forecasts, and location- or sector-specific weather alerts, on a one-time or subscription basis. Such information services could offer significant value to clients' planning and O&M decisions, e.g., irrigation, planting, and harvesting scheduling by farmers. Pricing will be tailored to the target market, taking into account affordability. An information technology platform will be developed to allow the provision of such services through widely available communication media such as email, web, short messaging service, and apps. The project will support the development of a marketing strategy and implementation plan, including pricing schedule and product development. Information products will be developed through consultation with key stakeholders, farmers, and communities in the PRB, and made available through the platform. Hydromet staff will be trained in the O&M of the subscription platform and product development.

D. Investment and Financing Plans

18. The overall project is estimated to cost \$44.40 million. The additional financing is estimated to cost \$12.79 million (Table 1).

Table 1: Project Investment Plan
(\$ million)

Item	Current Amount ^a	Additional Financing ^b	Total
A. Base Cost^c			
1. Output 1: Water resources in PRB better managed	0.00 ^d	10.45	10.45
2. Output 2: CIS WRM modernized and climate-proofed	25.49	0.00	25.49
3. Output 3: Farm management and water use improved	3.05	1.35	4.40
Subtotal (A)	28.54	11.80	40.34
B. Contingencies	2.37^e	0.99^f	3.36
C. Financing Charges During Implementation	0.70^g	0.00	0.70
Total (A+B+C)	31.61	12.79	44.40

CIS = Chubek Irrigation System, PRB = Pyanj River Basin, WRM = water resources management.

^a Refers to the original amount. Includes taxes and duties of \$3.61 million financed from government resources.

^b Includes taxes and duties of \$1.29 million to be financed from government resources.

^c In mid-2015 prices for current project and mid-2017 prices for the additional financing.

^d Output 1 of the current project is implemented by attached technical assistance (TA 9183-TAJ) totaling \$2.21 million.

^e Physical contingencies for the current project computed at 5% for all expenditure accounts. Price contingencies computed at 1.1% on foreign exchange costs and 5.0% on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

^f Physical contingencies for the additional financing computed at 3% for consulting services and 5% for remaining expenditure items. Price contingencies on foreign exchange costs computed at 1.5% for 2019, 3.0% for 2020, 4.6% for 2021, 6.3% for 2022, and 8.0% for 2023; and on local currency costs at 7.3% for 2019, 15% for 2020, 23% for 2021, 31% for 2022, and 41% for 2023 of base cost expenditures plus physical contingencies. Exchange rate movements are assumed to be determined entirely by purchasing power parity theory.

^g Includes interest during construction. Interest during construction for the Asian Development Bank loan has been computed at 1% per annum.

Source: Asian Development Bank estimates.

19. The government has requested (i) a grant not exceeding \$6.5 million from ADB's Special Funds resources (Asian Development Fund), and (ii) a grant not exceeding \$5.0 million from the GCF to help finance the project. The government contribution is estimated at \$1.3 million, comprising taxes and duties.²⁴ The financing plan is in Table 2.

Table 2: Financing Plan

Source	Current ^a		Additional Financing		Total	
	Amount (\$ million)	Share of Total (%)	Amount (\$ million)	Share of Total (%)	Amount (\$ million)	Share of Total (%)
Asian Development Bank						
Special Funds resources (loan)	19.15	61	0.00	0	19.15	43
Special Funds resources (grant)	5.85	19	6.50	51	12.35	28
Japan Fund for Poverty Reduction (grant) ^b	3.00	9	0.00	0	3.00	7
Green Climate Fund (grant)	0.00	0	5.00	39	5.00	11
Government	3.61	11	1.29	10	4.90	11
Total	31.61	100	12.79	100	44.40	100

^a Refers to the original amount.

^b Administered by the Asian Development Bank.

Sources: Asian Development Bank estimates.

²⁴ The government contribution will not include income tax and social tax of Hydromet PIG staff (para. 20) and national and international consultants. The ADB grant will finance income tax and social taxes of the Hydromet PIG. The ADB grant and GCF grant will jointly finance income and other unidentifiable taxes of consultants in accordance with Appendix 4C (p. 3, para. [ii]) of ADB's *Loan Disbursement Handbook* (2017, as amended from time to time).

E. Implementation Arrangements

20. Hydromet will be added as a third executing agency under the project, responsible for implementing the additional financing activities.²⁵ A new PIG will be established within Hydromet to execute the additional financing. A PIC led by an international team leader will be recruited to support project implementation. To expedite project readiness, Hydromet will aim to issue the requests for proposals to the consulting firms before Board approval. The implementation arrangements are summarized in Table 3 and described in detail in the project administration manual.²⁶ For the additional financing project, universal procurement will apply, as ADB and GCF's resources will jointly finance individual procurement packages.

Table 3: Implementation Arrangements for Additional Financing

Aspects	Arrangements		
Implementation period	November 2018–June 2023		
Estimated completion date	30 June 2023		
Estimated grant closing date	31 December 2023		
Management			
(i) Oversight body	Project steering committee Deputy prime minister (chair) Director of the ALRI; chairs of the Committee on Environmental Protection, Committee for State Investment and State Property Management, and Committee for Women and Family Affairs; deputy ministers of the ministries of agriculture, economic development and trade, energy and water resources, foreign affairs, and finance (members)		
(ii) Executing agency	Hydromet		
(iii) Implementation unit	Dushanbe, expected 13 Hydromet PIG staff		
Procurement	International competitive bidding	3 contracts	\$4.8 million (estimate)
	National competitive bidding	5 contracts	\$2.0 million (estimate)
	Shopping	Multiple contracts	\$0.25 million (estimate)
Consulting services	Quality- and cost-based selection (90:10)	44 person-months international 158 person-months national (estimate)	\$1.9 million ^a (estimate)
Retroactive financing and/or advance contracting	Advanced contracting will be used to recruit the project implementation consultant.		
Disbursement	The grant proceeds will be disbursed in accordance with ADB's <i>Loan Disbursement Handbook</i> (2017, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.		

ADB = Asian Development Bank, ALRI = Agency for Land Reclamation and Irrigation, Hydromet = State Agency for Hydrometeorology of Tajikistan, PIG = project implementation group.

Note: Cost estimates exclude government contributions in the form of exemptions to taxes and duties.

^a Includes travel, workshops, studies, surveys and design, office administration and equipment, and contingencies.

Sources: Asian Development Bank estimates.

²⁵ The executing agencies for the current project are MEWR (output 1) and ALRI (output 2 and 3).

²⁶ Project Administration Manual (accessible from the list of linked documents in Appendix 2).

III. DUE DILIGENCE

A. Technical

21. The project was designed with a view to establish a sustainable and viable national institution, based on detailed studies on Hydromet's organizational and technical capacity and legal structure. The planned legal and organizational transformations, along with the modernization of the operations center, will help overcome key institutional weaknesses and barriers. This will provide a solid foundation upon which Hydromet may develop technical capacity for monitoring, forecasting, and informing the public.

B. Economic and Financial

22. The economic assessment confirmed the economic viability of the additional financing project. The calculated economic internal rate of return is 11% and the economic net present value is \$6.5 million at the discount rate of 6% for disaster risk reduction investments.²⁷ The project-quantified benefits are incremental avoided future impacts of flooding in the PRB area, arising from a strengthened Hydromet providing improved services. The economic results are robust to alternative cost and benefit scenarios. Nonquantifiable benefits include increased agricultural productivity and avoidance of damage, displacement, and deaths from climate-related disasters.

23. The project is also expected to provide significant financial benefits to Hydromet and contribute to its long-term viability. As with other national meteorological agencies, it is envisaged that Hydromet will remain funded primarily through the government budget during and after the project because of its public service mandate. The project will help Hydromet secure additional commercial revenues to support increased investment and O&M expenditures for improved sustainability. These revenues are expected to contribute about 10% of Hydromet's annual budget by project completion and 15% by 2030. In addition, effective annual salary packages for key Hydromet staff are expected to more than double by 2025 against the without-project case, as a result of improved funding from commercial revenues and housing benefits, and thereby help Hydromet attract and retain highly skilled staff.

C. Governance

24. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and Hydromet. The specific policy requirements and supplementary measures are described in the project administration manual (footnote 26).

25. The financial management assessment of Hydromet concluded that it represents a substantial risk because of less effective internal controls, accounting and financial reporting, and funds flow. Mitigation measures have been incorporated into the project design, including (i) recruiting experienced and qualified staff for the PIC; (ii) providing financial management support and training under the PIC; and (iii) providing training in ADB procedures related to audit, disbursement, and project management.

26. The procurement capacity assessment concluded that Hydromet represents a substantial risk because of (i) lack of qualified procurement staff; (ii) lack of experience and unfamiliarity with competitive procurement processes consistent with ADB's Procurement Guidelines (2015, as

²⁷ ADB. 2017. *Business Processes for Economic Analysis of Projects. Compendium of Staff Instructions*. Manila.

amended from time to time); (iii) insufficiently centralized record keeping; and (iv) inadequate integrity and anticorruption measures in place. Mitigation measures have been incorporated into the project design, including (i) recruiting experienced and qualified staff for the PIG; (ii) providing procurement support and training under the PIC; (iii) providing training in ADB procurement procedures, including ADB standard bidding documents; and (iv) use of prior review procedures.

D. Poverty and Social

27. **Poverty.** The poorest households in the PRB are generally the most vulnerable to the impacts of climate change. The project will improve the provision of climate services and warnings to stakeholder agencies, community groups, and individuals, including on damaging flood events in the PRB. Improved provision of information products marketed at farmers and local communities will support decision making in agriculture, WRM, and other climate-sensitive activities, thereby improving the livelihoods and income of the poor.

28. **Social and gender.** The additional financing project is categorized *effective gender mainstreaming*. The project will ensure consultations, training, and awareness campaigns for flood forecasting and fee-based information services are gender-sensitive, with significant female representation. The project will narrow gender gaps in Hydromet by increasing female representation in key positions and providing training in management, administration, and control.

E. Safeguards

29. In compliance with ADB's SPS, the project's safeguard categories are as follows.

30. **Environment (category B).** The project's residual adverse impacts are not expected to be significant, after the implementation of feasible environmental management measures. Expected construction-phase impacts are not significant or complex. The draft initial environmental examination was disclosed on ADB's website, following receipt of Hydromet's concurrence, in January 2018.²⁸ The Hydromet PIG will submit semiannual safeguard monitoring reports to ADB and establish and implement the grievance redress mechanism described in the initial environmental examination.

31. **Involuntary resettlement (category C).** No involuntary acquisition of land or involuntary restrictions on land use are expected, according to the SPS definition. The Hydromet PIG and PIC will confirm this during implementation. If any additional land requirements or involuntary resettlement impacts are identified, a resettlement plan will be prepared in accordance with ADB's SPS and approved by ADB before any related civil works contract is awarded.

32. **Indigenous peoples (category C).** No indigenous peoples are present in the project area, according to the SPS definition.

F. Risks and Mitigating Measures

33. Major risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.²⁹

²⁸ Government of Tajikistan, Agency for Hydrometeorology Committee of Environment Protection. 2017. *Initial Environmental Examination: Additional Financing for Water Resources Management in the Pyanj River Basin Project* (prepared for ADB).

²⁹ 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	Mitigating Measures
High demand for technically skilled staff in the labor market may compromise staff recruitment and retention and reduce the benefits of institutional development and capacity building.	The project will support the increase of Hydromet staff salary packages through (i) government commitment for adequate core budget for staff salaries during project implementation, (ii) facilitating Hydromet to support O&M budget with additional commercial revenues, and (iii) enabling Hydromet to provide housing benefits to key technical staff.
Delays in construction schedule	Using advance contracting, the consultant for detailed design, bid preparation, and construction supervision will be fielded from December 2018 or January 2019 to enable Hydromet to initiate the bid process for major contracts by mid-2019. The bidding document will include performance incentives and penalties to avoid delays in the construction schedule. ADB is improving its efficiency in project management and has shortened the disbursement time lag. A time monitoring sheet for each project implementation milestone will be available and updated by supervision consultants.
Insufficient core government funding may threaten sustainability of modernized operation center, equipment, and staff retention.	The government has agreed to contribute adequate O&M budget. A sustainable O&M plan, including annually updated budget projections, will be developed under the project, and the project will provide capacity building to senior staff on management and administration.
Supreme audit institution has not yet been established; external audit not yet in place	The project will be audited annually by independent private auditors in accordance with the International Standards on Auditing.

Hydromet = State Agency for Hydrometeorology of Tajikistan, O&M = operation and maintenance.
Source: Asian Development Bank.

IV. ASSURANCES

34. The government and Hydromet 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 project administration manual and grant documents. The government and Hydromet have agreed with ADB on certain covenants for the project, which are set forth in the project grant agreement.

V. RECOMMENDATION

35. I am satisfied that the proposed grant would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the grant not exceeding \$6,500,000 to the Republic of Tajikistan from ADB's Special Funds resources (Asian Development Fund) for the additional financing of the Water Resources Management in the Pyanj River Basin Project, on terms and conditions that are substantially in accordance with those set forth in the draft grant agreements presented to the Board.

Takehiko Nakao
President

28 May 2018

REVISED DESIGN AND MONITORING FRAMEWORK

Impacts the Project is Aligned with			
<p>Current project</p> <p>Irrigated land in good condition and food security increased^a The efficiency of water resource use increased^b</p> <p>Overall project</p> <p>Above impacts unchanged Climate resilience of agriculture and water resources management improved^c</p>			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
<p>Outcome</p> <p>Current project</p> <p>Increased agricultural production in CIS area of PRB</p> <p>Overall project</p> <p>Agricultural productivity and relevance of forecasting services increased in the PRB</p>	<p>Current project</p> <p>By December 2022,</p> <p>a. Cultivated irrigated areas served by CIS increased to originally designed 50,163 ha (2014 baseline: 43,210 ha)</p> <p>b. Cropping intensities increased by 10% for gravity irrigation and by 50% for pump irrigation (2014 baselines cropping intensities: 118% for gravity irrigation and 106% for pump irrigation)</p> <p>c. Crop yield increased by 8% (2014 baseline:^d)</p> <p>Overall project</p> <p>a–c. Unchanged</p> <p>By December 2024,</p> <p>d. Share of surveyed government and civil society stakeholders “satisfied” with Hydromet’s forecasting services increased to 30% (2017 baseline: 20%)</p> <p>e. Share of annual Hydromet budget contributed by income from sale of fee-based services increased to 1.5% (2017 baseline: 0%)</p>	<p>a. ALRI reports</p> <p>b–c. Provincial and district agricultural statistics, and NGOs’ report through ALRI</p> <p>a–c. Unchanged</p> <p>d. Hydromet market survey reports</p> <p>e. Hydromet annual reports</p>	<p>Extreme climate events hamper agricultural production.</p>
<p>Outputs</p> <p>Output 1</p> <p>Current project</p> <p>Water resources in PRB better managed</p>	<p>Current project</p> <p>1a. Joint Afghanistan–Tajikistan PRB committee commences monitoring the Pyanj River water by Q2 2018 (2014 baseline: none)</p> <p>1b. PRBMP, including drought management plan, submitted to PRB council by Q1 2019 (2014 baseline: none)</p>	<p>1a–e. MEWR reports</p>	<p>The formation of the PRB committee in Afghanistan is delayed or not implemented because of security issues.</p>

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
<p>Overall project Unchanged</p> <p>Output 2 Current project CIS WRM modernized and climate-proofed</p>	<p>1c. Water discharge monitored at key sections of Pyanj River matches the actual diversions by Q2 2021 (2014 baseline: actual diversion to Chubek main canal is 63% of the monitored discharge)</p> <p>1d. PRBO and PRBC management structures each include at least one woman by Q4 2017 (2014 baseline: 0)</p> <p>1e. At least 30% of the participants in stakeholder meetings in PRB council are women by Q2 2018 (2014 baseline: 0)</p> <p>Overall project</p> <p>1a–e. Unchanged By June 2021,</p> <p>1f. Hydromet transformed to state entity with right to seek, retain, and use additional commercial income (2017 baseline: not applicable) By June 2023,</p> <p>1g. New Hydromet operation center modernized with gender-sensitive facilities (2017 baseline: not applicable)</p> <p>1h. Local flood forecasts issued for pilot PRB districts on Hydromet website at least 36 hours in advance with >40% probability of detection and <25% false alarm rate (2017 baseline: not applicable)</p> <p>1i. At least 500 individuals in the PRB (of which 30% are female) report increased knowledge on flood warnings and preparedness (2017 baseline: 0)</p> <p>Current project</p> <p>By June 2021,</p> <p>2a. Irrigation conveyance efficiency for on-farm canal in CIS increased to 66% for gravity-fed system and 82% for pump-fed system (2014 baseline: 60% for both systems)</p> <p>2b. Pump efficiency of target pump stations in CIS increased to 75% (2014 baseline: less than 50%)^e</p>	<p>1a–e. Unchanged</p> <p>1f. Government resolution or decision</p> <p>1g–i. Hydromet project reports</p> <p>2a–d. ALRI and consultant reports</p>	<p>Government does not effectively support national water sector reforms.</p> <p>Increased security concerns near Afghanistan border hamper engagement of competent contractors.</p> <p>Weak security hinders engagement of capable NGOs to provide services.</p> <p>High domestic demand for skilled scientific professionals leads to higher than expected staff turnover.</p> <p>Delays in construction schedule.</p> <p>Insufficient core government funding may threaten sustainability of modernized operation center, equipment, and staff retention.</p> <p>Supreme audit institution has not yet been established; external audit not yet in place.</p>

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
<p>Overall project Unchanged</p> <p>Output 3</p> <p>Current project Farm management capacity and water use skill improved</p> <p>Overall project Unchanged.</p>	<p>2c. Sediment entering CIS canal reduced to 112,500 m³/year (2014 baseline: 460,000 m³/year)</p> <p>2d. Access to water for household use provided by installation of 12 water points along main canal and three water points along each target inter-farm canal (2015 baseline: 0)</p> <p>Overall project Unchanged</p> <p>Current project By December 2021,</p> <p>3a. WUAs coverage of CIS area increased to 100% (2014 baseline: 83%)</p> <p>3b. Average collection rate (in value terms) of irrigation service fee among all WUAs increased to 80% (2014 baseline: 46%)</p> <p>3c. Women's membership in WUAs increased to 30% (2014 baseline: 13%)</p> <p>3d. Average water use ratio (i.e., field application efficiency) in CIS area increased to 60% (2014 baseline: 50%)</p> <p>3e. At least 30% of women lead demonstration plot activities (2014 baseline: 0)</p> <p>Overall project 3a–e. Unchanged By June 2023,</p> <p>3f. IT platform for sale of Hydromet information and forecasting products established, including government-approved pricing plan (2017 baseline: not applicable)</p> <p>3g. At least 500 individuals (of which 30% are female) report increased knowledge on receiving and using weather forecasting products in the PRB (2017 baseline: 0)</p>	<p>3a–c. NGO reports through ALRI</p> <p>3d. ALRI reports</p> <p>3e. NGOs reports through ALRI</p> <p>3a–e. Unchanged</p> <p>3f-g. Hydromet project reports</p>	

Key Activities with Milestones

Output 1: Water resources in PRB better managed

- 1.1 Facilities of PRB organization available and equipped by Q3 2018 (changed)
- 1.2 Establish PRB organization by Q3 2018 (changed)
- 1.3 Establish PRB council by Q4 2018 (changed)
- 1.4 PRB organization prepares PRBMP by Q4 2018 (unchanged)
- 1.5 PRB council reviews PRBMP by Q2 2019 (unchanged)
- 1.6 Establish joint PRB committee with Government of Afghanistan by Q3 2019 (changed)
- 1.7 Joint PRB committee prepares PRB WRM monitoring system by Q2 2020 (changed)
- 1.8 Joint PRB committee approves PRB WRM monitoring system by Q3 2020 (changed)
- 1.9 Training of local MEWR staff completed by Q2 2021 (unchanged)
- 1.10 Flood risk mapping of PRB prepared and pilot districts selected by Q3 2019 (added)
- 1.11 Detailed design, including IT system integration, prepared by Q4 2019 (added)
- 1.12 Hydromet relocated to modernized and fitted-out operation center by Q3 2020 (added)
- 1.13 Draft legal documents for Hydromet transformation submitted to government by Q4 2019 (added)
- 1.14 Capacity building in strategy, management, administration, and control by Q2 2020 (added)
- 1.15 User feedback and service performance M&E system established by Q2 2020 (added)
- 1.16 Prepare sustainable Hydromet O&M plan, including budget projections, by Q2 2021 (added)
- 1.17 Regional knowledge sharing event held by Q4 2021 (added)
- 1.18 Annual stakeholder surveys and workshops on Hydromet services undertaken by Q2 2023 (added)
- 1.19 Consultation and training in flood forecasting and warning undertaken by Q1 2022 (added)

Output 2: Modernized and climate-proofed CIS WRM fully operational

- 2.1 Complete modernization of main and inter-farm irrigation structures by Q2 2021 (unchanged)
- 2.2 Complete modernization of pump stations by Q2 2021 (unchanged)
- 2.3 Complete construction of sediment, excluding basin, by Q3 2020 (unchanged)
- 2.4 Equipment of O&M of main CIS including sediment excluding basin available by Q3 2020 (unchanged)
- 2.5 SCADA system starts operation by Q3 2020 (unchanged)
- 2.6 Conduct capacity development program for ALRI staff and WUA support units by Q4 2020 (unchanged)
- 2.7 Complete deposited sediment cleaning work along CIS by ALRI by Q2 2021 (unchanged)
- 2.8 Adopt O&M plan and water management system of CIS by Q2 2020 (unchanged)
- 2.9 Complete feasibility study for alternate irrigation method for non-target pump-fed areas by Q2 2019 (unchanged).

Output 3: Farm management capacity and water use skill improved.

- 3.1 Engage NGOs to implement the output (completed)
- 3.2 Conduct capacity development program for improved farm management by Q4 2021 (unchanged)
- 3.3 Select demonstration plots by Q2 2020 (unchanged)
- 3.4 Conduct WUA training program by Q4 2021 (unchanged)
- 3.5 Clean up deposited sediments along CIS on-farm drains by WUAs and water users by Q4 2021 (changed)
- 3.6 Record and publish experience of women's full participation in water use trainings as example of best practices by Q2 2020 (unchanged)
- 3.7 Hold consultation and training on weather information services by Q1 2022 (added)
- 3.8 Undertake installation and system integration of IT systems, including update of Hydromet website, by Q2 2020 (added)
- 3.9 Market at least one new weather information product to customers in the PRB by Q4 2020 (added)

Project Management Activities

- ALRI Project Management Office's initiation of recruitment process of the consultant in each output (completed)
- Recruitment of consultants (completed)
- Initiation of the bid process of the major contract (i.e., pump stations and sediment-excluding basin) by Q2 2018 (changed)

Key Activities with Milestones

Initiation of the bid process of the heavy machinery equipment by Q1 2019 (changed)
 Contracts for the heavy machinery equipment awarded by Q2 2019 (changed)
 Contract for the major irrigation-related works awarded by Q4 2018 (changed)
 Hydromet PIG established and staffed by Q4 2018 (added)
 Project implementation consultants for Hydromet mobilized by Q4 2018 (added)
 Civil works contracts for additional financing awarded by Q2 2020 (added)
 Goods contracts for additional financing awarded by Q2 2020 (added)

Inputs**ADB**

Loan ^f	Grant ^h
\$19.15 million ^g (current)	\$5.85 million (current)
\$0 (additional)	\$6.50 million (additional)
\$19.15 million (overall)	\$12.35 million (overall)

JFPR

Grant	Technical Assistance Grant
\$3.0 million (current)	\$2.0 million (current)
\$0 (additional)	\$0 (additional)
\$3.0 million (overall)	\$2.0 million (overall)

GCF

Grant
\$0 (current)
\$5.0 million (additional)
\$5.0 million (overall)

Government

\$3.61 million (current)
\$1.29 million (additional)
\$4.90 million (overall)

Assumptions for Partner Financing**Current project**

Not applicable

Overall project

Unchanged

ADB = Asian Development Bank, ALRI = Agency for Land Reclamation and Irrigation, CIS = Chubek Irrigation System, GCF = Green Climate Fund, ha = hectare, Hydromet = State Agency for Hydrometeorology of Tajikistan, IT = information technology, JFPR = Japan Fund for Poverty Reduction, m³ = cubic meter, M&E = monitoring and evaluation, MEWR = Ministry of Energy and Water Resources, NGO = nongovernment organization, O&M = operation and maintenance, PIG = project implementation group, PMO = project management office, PRB = Pyanj River Basin, PRBC = Pyanj River Basin council, PRBMP = Pyanj River Basin Management Plan, PRBO = Pyanj River Basin organization, Q = quarter, SCADA = supervisory control and data acquisition, t/ha = tons per hectare, WRM = water resources management, WUA = water users association.

^a Government of Tajikistan, ALRI. 2016. *Land Reclamation and Irrigation Development Strategy*. Dushanbe.

^b Government of Tajikistan, MEWR. 2015. *Water Sector Reform Program for 2016–2025*. Dushanbe.

^c Government of Tajikistan. 2015. Intended Nationally Determined Contribution toward the achievement of the global goal of the UN Framework Convention on Climate Change by the Republic of Tajikistan. Dushanbe.

^d Wheat (2.96 t/ha), cotton (2.05 t/ha), vegetables (21.00 t/ha), orchard (8.93 t/ha), fodder maize (18.00 t/ha).

^e Pump efficiency is defined here as pumped water volume divided by consumed energy.

^f Ordinary capital resources (concessional loan).

^g Equivalent.

^h Asian Development Fund grant.

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

<http://www.adb.org/Documents/RRPs/?id=47181-003-2>

1. Grant Agreement: Special Operations
2. Grant Agreement: Externally Financed
3. Sector Assessment (Summary): Agriculture, Natural Resources, and Rural Development
4. Project Administration Manual
5. Summary of Project Performance
6. Contribution to the ADB Results Framework
7. Development Coordination
8. Financial Analysis
9. Economic Analysis
10. Country Economic Indicators
11. Summary Poverty Reduction and Social Strategy
12. Gender Action Plan
13. Initial Environmental Examination
14. Risk Assessment and Risk Management Plan

Supplementary Documents

15. Financial Management Assessment
16. Project Procurement Risk Assessment
17. Project Climate Risk Assessment and Management Reporting