Report and Recommendation of the President to the Board of Directors

Project Number: 50387-001
August 2019

Proposed Loan
Republican State Enterprise Kazvodkhoz Irrigation Rehabilitation Project
(Guaranteed by the Republic of Kazakhstan)

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 7 August 2019)

Currency unit	–	tenge (T)
T1.00	=	$0.002285
$1.00	=	T386.81

ABBREVIATIONS

ADB	–	Asian Development Bank
EIRR	–	economic internal rate of return
GDP	–	gross domestic product
ha	–	hectare
IEE	–	initial environmental examination
km	–	kilometer
KVK	–	Republican State Enterprise Kazvodkhoz
O&M	–	operation and maintenance
PAM	–	project administration manual
SCADA	–	supervisory control and data acquisition
TA	–	technical assistance

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

Vice-President	Shixin Chen, Operations 1
Director General	Werner Liepach, Central and West Asia Department (CWRD)
Director	Donneth Walton, Environment, Natural Resources and Agriculture Division, CWRD
Team leader	Yaozhou Zhou, Principal Water Resources Specialist, CWRD
Team members	Kenzhekhan Abuov, Project Officer, CWRD Elena Alano, Senior Project Officer, CWRD Giap Minh Bui, Principal Natural Resources and Agriculture Economist, CWRD Cindy Shayne Cabrales-Chiong, Associate Project Analyst, CWRD Michael De Los Reyes, Senior Treasury Specialist, Treasury Department Nurlan Djenchuraev, Senior Environment Specialist, CWRD Baurzhan Konysbayev, Principal Counsel, Office of the General Counsel Tal'at Nasirov, Senior Project Officer, CWRD Diep Pham, Senior Financial Management Specialist, CWRD Nathan Rive, Climate Change Specialist, CWRD Mary Alice Rosero, Social Development Specialist (Gender and Development), CWRD Aida Satylganova, Social Development Specialist (Safeguards), CWRD
Peer reviewer	Arnaud M. Cauchois, Principal Water Resources Specialist, South Asia Department

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PROJECT AT A GLANCE

1. Basic Data — **Project Number:** 50387-001

Project Name	Irrigation Rehabilitation Project	**Department /Division**	CWRD/CWER
Country	Kazakhstan	**Executing Agency**	RSE KazvodKhoz
Borrower	Republican State Enterprise (RSE) KazVodkhoz		

2. Sector

	Subsector(s)	ADB Financing ($ million)
✓ **Agriculture, natural resources and rural development**	Agricultural drainage	35.50
	Irrigation	189.30
	Rural water policy, institutional and capacity development	25.00
	Total	**249.80**

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)	Global and regional transboundary environmental concerns Natural resources conservation	**ADB Financing** Adaptation ($ million)	40.13

4. Drivers of Change

	Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Institutional development Organizational development	Effective gender mainstreaming (EGM)	✓
Knowledge solutions (KNS)	Application and use of new knowledge solutions in key operational areas		

5. Poverty and SDG Targeting

		Location Impact	
Geographic Targeting	No	Rural	High
Household Targeting	No	Urban	Low
General Intervention on Poverty	Yes		
SDG Targeting	Yes		
SDG Goals	SDG2, SDG5, SDG6, SDG10, SDG12, SDG13		

6. Risk Categorization: Complex

7. Safeguard Categorization **Environment:** B **Involuntary Resettlement:** C **Indigenous Peoples:** C

8. Financing

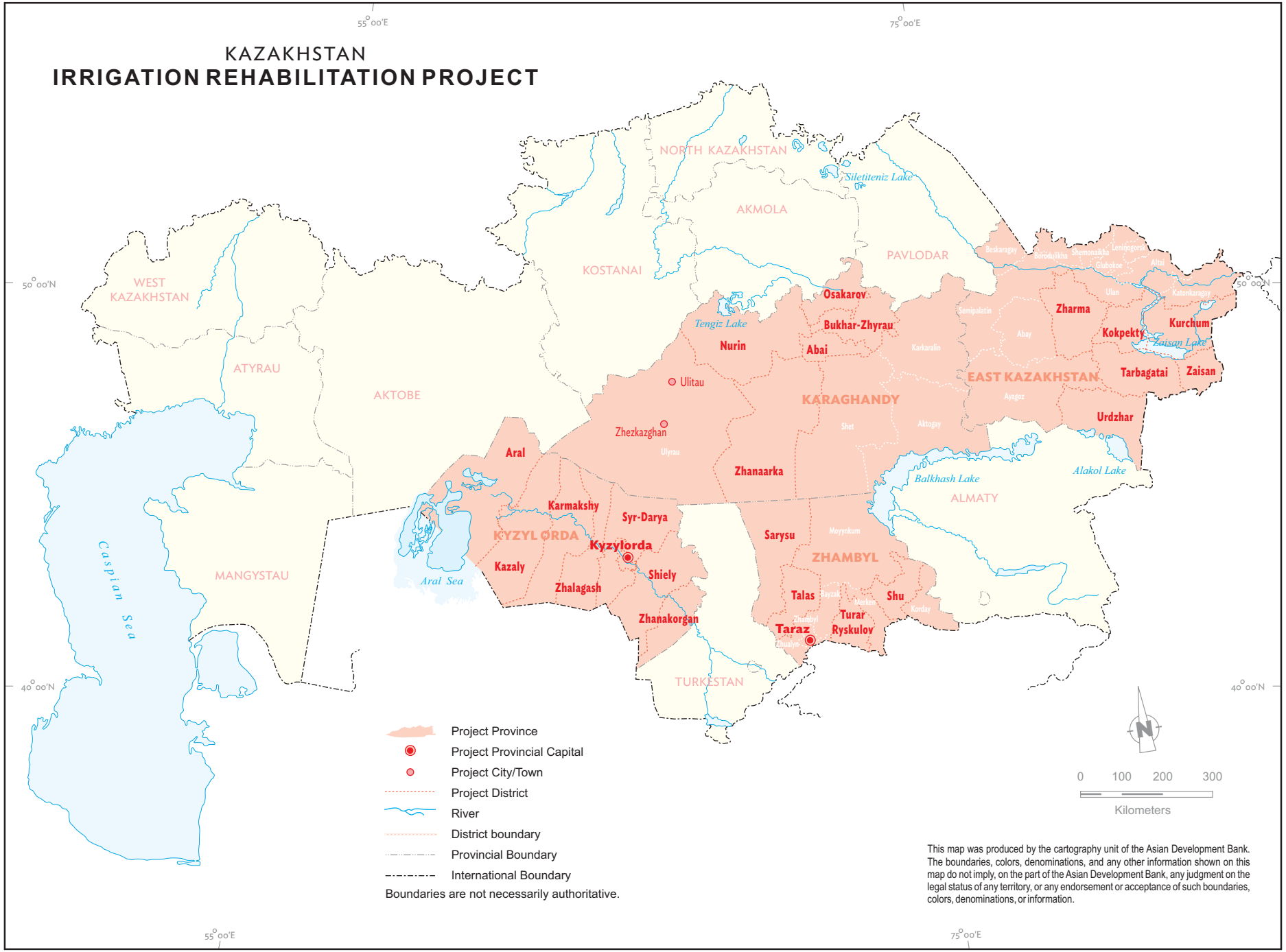
Modality and Sources	Amount ($ million)
ADB	**249.80**
Sovereign Project (Regular Loan): Ordinary capital resources	249.80
Cofinancing	**0.00**
None	0.00
Counterpart	**71.08**
Project Sponsor	71.08
Total	**320.88**

Currency of ADB Financing: KZT

Source: Asian Development Bank

KAZAKHSTAN

IRRIGATION REHABILITATION PROJECT



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I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the Republican State Enterprise Kazvodkhoz (KVK), to be guaranteed by the Republic of Kazakhstan, for the Irrigation Rehabilitation Project.[1]

2. The project will support the rehabilitation and improvement of irrigation networks serving about 171,100 hectares (ha) of land in Kazakhstan's East Kazakhstan, Karaghandy, Kyzylorda, and Zhambyl provinces. The project will promote the diversification from traditional low-yielding and low-value grain crops into high-value cash crops. It will also build the capacity of farmers and KVK for improved water and irrigation management.

II. THE PROJECT

A. Rationale

3. Kazakhstan is a sparsely populated country with significant mineral wealth and vast amounts of agricultural land. Since gaining independence in 1991, it has evolved from a command economy to a market-based economy. While the country achieved middle-income status in 2006 mainly thanks to a surge in oil and gas exports, the downturn of oil and other commodity prices in 2014 exposed its vulnerability to external shocks. Kazakhstan continues to struggle to diversify its economy, strengthen its institutions, and balance regional disparities between its few economic centers and a vast periphery, where public services remain scarce and of poor quality.

4. Agriculture is an important but neglected sector in the national economy, employing 18.0% of the labor force and contributing 4.4% of gross domestic product (GDP) in 2017. Despite its economic potential, the sector's contribution to GDP has been decreasing.[2] Moreover, about 42% of the country's population is in rural areas where living standards depend heavily on income generated from agricultural production. Women make up 29% of the workforce in agriculture, and 64% of rural women are self-employed, mostly in activities directly related to agriculture. Kazakhstan has enormous underused agricultural potential that could help make economic growth more diverse and inclusive. By the end of 2018, its agricultural area totaled 221.4 million ha, of which 25.8 million ha or 12% was classified as arable land and 186.2 million ha or 84% as pasture land.[3] Kazakhstan's per capita arable land of about 1.65 ha is the second highest after Australia.[4]

5. During the country's transition in the 1990s and the uncertainties that accompanied it, agricultural production ceased on large areas of land. The situation began to improve at the start of the new millennium, but the total agricultural area in 2015 was still 40% lower than in 1990, and the value of agricultural output only recently reached pre-independence levels. Major agricultural products include grains (wheat, barley, maize, buckwheat, and rice); cotton; potatoes; vegetables; melons; sugar beets; sunflowers; and livestock. Despite Kazakhstan's historical role as an agricultural exporter, the sector's trade performance remains poor. Low agricultural productivity

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[1] KVK is a state-owned enterprise whose mandate is to rehabilitate, operate, and maintain water facilities (reservoirs, canals, pumping stations, and other facilities); and to supply irrigation and drinking water to users.

[2] The Statistics Portal. Kazakhstan: Share of Economic Sectors in the Gross Domestic Product (GDP) from 2007 to 2017; and The Statistics Portal. Kazakhstan: Distribution of Employment by Economic Sector from 2007 to 2018 (accessed 8 April 2019).

[3] Government of Kazakhstan, Ministry of Agriculture. Land Resources of the Republic of Kazakhstan (document is in Russian).

[4] World Bank Open Data. Arable Land (Hectares per Person) (accessed 8 April 2019).

and poor sector governance limit income opportunities in rural areas and undermine the government's overall goal of inclusive economic growth.

6. In the early 1990s, the government embarked on several important policy and legal reforms in agriculture, including land reforms. The reforms initially focused on dismantling the state ownership of land and agricultural production and establishing the legal and institutional basis for private and market-based agriculture. It was a massive task to restructure a system of giant state farms under a command economy to a system of privately run, profitable farm units. While all land remained in state ownership in the 1990s, a new land code was adopted in 2003 and came into force in 2005, allowing private ownership of agricultural land with all property rights. Kazakhstan's accession to the World Trade Organization in 2015 increased its access to external markets and boosted competition and vertical integration, which should have led to higher productivity in the sector. The Asian Development Bank (ADB) provided a loan to support the government's agriculture reform in three policy areas: creating markets, promoting market competitiveness, and strengthening social and environmental protection in 1995.[5]

7. Before the breakup of the Soviet Union, Kazakhstan witnessed the construction of extensive, centrally planned irrigation systems that were managed and operated by the provincial administrations. After the breakup, between 1991 and 1999, 20.6 million ha of cropland were abandoned, according to an ADB diagnostic study.[6] The irrigated area was estimated at 2.3 million ha in 1991, but by 2018 it had dwindled to about 1.4 million ha.[7] The study identified the key challenges for the sector: (i) restructuring massive Soviet state farms into smaller, more efficient farms; (ii) enabling crop intensification to better match highly variable growing conditions; (iii) pricing water appropriately to manage its scarcity more effectively; (iv) improving public infrastructure for agriculture development; and (v) reducing value-chain fragmentation (footnote 6).

8. The further development of the irrigation subsector is a key element of government efforts to diversify Kazakhstan's economy, promote food security, and reduce poverty. The rehabilitation of irrigation schemes and renewed cultivation of abandoned land could help increase agricultural productivity and rural incomes. Maximizing the opportunity will depend on agricultural enterprises and small farmers responding to market incentives to diversify from traditional low-value and low-productivity cereal crops to higher-value crops such as oilseeds, vegetables, and fruit. The government's recent irrigated agriculture development plan has set ambitious targets to meet the economic development agenda, including the rehabilitation of 600,000 ha of irrigation systems by 2028.[8] To achieve this, the Ministry of Agriculture initiated large irrigation investment projects for support from international financial institutions such as ADB, with the primary aim to rehabilitate those irrigation schemes that had been poorly maintained and were subsequently abandoned.

9. A major hurdle to overcome is the insufficient availability of water at farms because of underinvestment in water storage and control infrastructure, water losses during conveyance and distribution, and in some cases dysfunctional water distribution networks as a result of neglected operation and maintenance (O&M). Other hurdles are (i) obsolete agricultural practices and on-farm water management technologies; (ii) low water delivery tariffs that do not generate sufficient funds for proper O&M; (iii) inadequate incentives for saving water; (iv) threats from floods, soil

[5] Operations Evaluation Department. 2001. *Program Performance Audit Report on the Agriculture Sector Program in Kazakhstan.* Manila: ADB.
[6] K. Anderson et al, eds. 2018. *Kazakhstan: Accelerating Economic Diversification*. Manila: ADB.
[7] Government of Kazakhstan, Ministry of Agriculture. Diversification of Irrigated Lands (document is in Russian).
[8] Government of Kazakhstan, Ministry of Agriculture. 2018. *Irrigated Land Development Plan Until 2028*. Astana.

salinity, and erosion; and (v) inadequate institutional capacity to ensure O&M of the systems and quality irrigation services to the farmers.

10. KVK, established in 2011 by merging various state water enterprises, aims to improve the country's irrigation network performance, asset ownership, and operational responsibility. KVK is 100% owned by the Committee for Water Resources of the Ministry of Agriculture.[9] This structure is common among public sectors in Kazakhstan—semiautonomous entities with a more corporate structure than their parent committees and ministries, aiming to increase accountability and transparency in public financial management and reporting, and to operate infrastructure more sustainably. KVK is improving its governance and capacity by implementing projects financed by the European Bank for Reconstruction and Development and the Islamic Development Bank. KVK needs to further improve its internal governance in financial management, procurement, and information disclosure; extend its advisory services to farmers for better on-farm water management; and support the development of agricultural cooperatives.

11. Kazakhstan has become increasingly aware of the role that cooperatives can play in agriculture. As of 30 June 2018, it registered 2,872 agricultural cooperatives and 62,825 member-farmers. The extent to which farmers are involved in cooperatives remains limited, however the ratio of cooperative members to total farmholds stands at just 3.4%.[10] The capacity and the role of agricultural cooperatives need to be strengthened to improve their governance and the services to their members. Cooperatives can help small household farms diversify to high-value crops by overcoming challenges such as high transaction costs and access to market.

12. Climate observations from 1960s to early 2010s show an average annual temperature increase of about 0.3°C per decade, and a small decrease in annual precipitation in Kazakhstan. Those trends are forecast to continue, with temperatures expected to be 4.5°C higher by 2050, winter precipitation expected to increase, and summer rains to decrease.[11] Water availability in the basins will diminish because of the increasing evapotranspiration of the natural vegetation, and a seasonal shift can be expected where peak flows will be 2–4 weeks earlier because of earlier snow melt. The demand for irrigation water will also increase slightly because of higher temperatures. While severe water shortages are not expected, demand might not be met in some years during the dry months.

13. **Strategic fit**. The project is aligned with Kazakhstan's long-term development strategy of improving the quality of life of its people and becoming one of the world's 30 most developed countries by 2050.[12] It will support the government's agriculture development strategy and irrigation development plan, including the State Program for the Development of the Agro-Industrial Complex, 2017–2021, which recognizes high losses in water conveyance from the low efficiency of the irrigation system.[13]

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[9] The Committee for Water Resources is now under the Ministry of Ecology, Geology and Natural Resources newly established in June 2019.

[10] Organisation for Economic Co-operation and Development (OECD). 2019. *Monitoring the Development of Agricultural Co-operatives in Kazakhstan*. Paris: OECD Publishing.

[11] 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: ADB.

[12] Official Site of the President of the Republic of Kazakhstan. 2012. Address by the President of the Republic of Kazakhstan, Leader of the Nation, N.A. Nazarbayev on Strategy "Kazakhstan-2050": New Political Course of the Established State. 14 December.

[13] Government of Kazakhstan, Ministry of Agriculture. State Program of Development of the Agro-Industrial Complex of the Republic of Kazakhstan for 2017–2021 (accessed 19 March 2019).

14. The project is in line with ADB's Strategy 2030 by supporting its priorities of promoting rural development and food security, and reducing remaining poverty and inequalities.[14] The project is consistent with ADB's county partnership strategy, 2017–2021, which supports Kazakhstan in achieving the medium-term development targets and climate change adaptation priorities set out in its national plans and commitments.[15] In particular, ADB will assist the government in building a more economically diversified, socially inclusive, and environmentally sustainable Kazakhstan; for instance, by providing loans to rehabilitate aging irrigation systems and improve water use efficiency on farms (footnote 15). The project also conforms to ADB's Water Operational Plan, 2011–2020 to boost water supply coverage and services and promote integrated management of water resources.[16]

15. **Lessons**. The World Bank, the European Bank for Reconstruction and Development, and the Islamic Development Bank approved three irrigation rehabilitation projects between 2013 and 2016. The design for the proposed ADB-financed project incorporates the lessons from these projects and from ADB interventions in irrigation management in developing member countries. Major lessons are: (i) support for agriculture development should be seen as an integral element of infrastructure rehabilitation; (ii) water use efficiencies need to be improved through practices such as deep ripping, land leveling, and more water-efficient irrigation technologies; (iii) suitable arrangements should be established not only for infrastructure O&M but also for strengthening the institutions involved in water management; (iv) the potential benefits of inter-farm and on-farm improvements cannot be fully achieved without improving the associated off-farm main canals and drainage systems; and (v) the rehabilitation process should adopt a participatory approach so that farmers can identify their needs and influence the rehabilitation agenda and its monitoring.

16. **Value added by ADB**. The project is expected to demonstrate the following innovations and/or value additions:

(i) **Local currency financing.** The project will provide tenge lending to KVK with a sovereign guarantee. This will be part of ADB's efforts to promote domestic financial markets as an alternative to foreign currency lending, which will help develop domestic capital markets and protect ADB's borrower from currency risk.

(ii) **Tariff planning and asset management plan.** The project will help improve KVK's capacity for tariff planning and financial sustainability. The project will support KVK to develop an asset management plan that will ensure cost recovery and lead to more sustainable irrigation systems.

(iii) **Use of geogrid reinforcement concrete for cost effectiveness.** The project team will pilot-test the use of geogrids—replacing the steel reinforcement of the concrete lining of the irrigation canals, which will reduce the investment cost substantially. Geogrids are used widely and successfully for earth reinforcement in roads and for slope protection, but less often in irrigation canals.

(iv) **Supervisory control and data acquisition system.** The project will support the installation of a supervisory control and data acquisition (SCADA) system in the main irrigation canals in each of the four provinces to help KVK control irrigation water management locally or at remote locations by monitoring, gathering, and processing real-time data for effective water management. Centralized data acquisition and remotely controlled operation of key water distribution structures

[14] ADB. 2018. *Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific*. Manila.

[15] ADB. 2017. *Country Partnership Strategy: Kazakhstan, 2017–2021—Promoting Economic Diversification, Inclusive Development, and Sustainable Growth*. Manila.

[16] ADB. 2012. *Water Operational Plan, 2011–2020*. Manila.

will also enable immediate and appropriate actions in case of an extreme adverse hydrological event in any part of the project area.

B. Impact and Outcome

17. The project is aligned with the following impact: the contribution of agricultural production to GDP increased (footnote 12). The project will have the following outcome: farm productivity increased in East Kazakhstan, Karaghandy, Kyzylorda, and Zhambyl provinces.[17]

C. Outputs

18. **Output 1: Irrigation infrastructure rehabilitated and/or improved.** The project will support the rehabilitation and/or improvement of about 245 irrigation schemes in the four provinces. For canals, the works would involve desilting and removing vegetation in the lined and unlined canals, re-sectioning the unlined canals, and repairing damaged sections of the lined canals. The total length of new concrete-lined canals will be about 1,064 kilometers (km), while that of improved earth canals will be about 1,976 km. About 4,185 hydraulic structures, including water measuring devices, will be constructed or rehabilitated. About 358 km of drainage collectors will be rehabilitated and/or improved, a drip irrigation system covering 9,300 ha will be established in Zhambyl, and about 24 SCADA systems will be installed in the main canals of the four provinces.

19. **Output 2: Water management improved and beneficiaries' capacity enhanced.** The project will support (i) pilot-testing a system to monitor water and agricultural productivity using remote sensing technology in selected irrigation schemes; (ii) assisting in organizing the beneficiaries into agricultural cooperatives, develop the capacity of the cooperatives for executing their function, and provide physical inputs such as office furniture and equipment; (iii) training farmers on effective irrigation management and climate-change-related aspects; and (iv) providing capacity development consulting services. This output will help KVK extend its advisory services to farmers on on-farm water management and crop choices.

20. **Output 3: KVK's capacity strengthened.** The project will strengthen KVK's governance and support its internal reforms by providing consulting services for (i) capacity development and training of KVK staff on financial, procurement, and water management aspects; the (ii) formulation and implementation of an asset management plan. The project will also support (i) provision of machinery, equipment, and vehicles for the four KVK branch offices to carry out their O&M function and improve system performance; (ii) rehabilitation and/or construction of repair workshops; (iii) construction of the KVK headquarters building; (iv) construction of an office building for KVK's East Kazakhstan branch; (v) organization of a study tour for KVK staff and project beneficiaries to learn from advanced irrigation practices; and (vi) the operations of the project management office and project implementation units to ensure smooth implementation.

D. Summary Cost Estimates and Financing Plan

21. The project is estimated to cost $320.88 million equivalent (Table 1). Detailed cost estimates by expenditure category and by financier are included in the project administration manual (PAM).[18] The major expenditure items include civil works, equipment, consultancy services, and project administration.

[17] The design and monitoring framework is in Appendix 1.
[18] Project Administration Manual (accessible from the list of linked documents in Appendix 2).

Table 1: Summary Cost Estimates

Item	Amount[a] (T billion)	Amount[a] ($ million)
A. Base Cost[b]		
1. Irrigation infrastructure rehabilitated and/or improved	68.05	180.03
2. Water management improved and beneficiaries' capacity enhanced	0.95	2.51
3. Republican State Enterprise Kazvodkhoz's capacity strengthened	8.33	22.04
Subtotal (A)	**77.33**	**204.58**
B. Contingencies[c]	**22.79**	**60.29**
C. Financial Charges During Implementation[d]	**21.17**	**56.01**
Total (A+B+C)	**121.29**	**320.88**

[a] Includes taxes and duties of T8.29 billion ($21.92 million) to be financed from Asian Development Bank (ADB) loan resources. Such amount does not represent an excessive share of the project cost.
[b] In first quarter of 2019 prices as of 20 May 2019.
[c] Physical contingencies computed at 10.0% for civil works, goods, and services. Price contingencies computed at average of 4.4% on local currency costs.
[d] Includes interest charges and commitment charges. Interest during construction for the tenge loan from ADB's ordinary capital resources was computed at 9.5% per year (based on the prevailing yield of comparable government-issued fixed-rate securities, plus an effective contractual spread of 0.5%). Commitment charge for the tenge loan is 0.15% per year to be charged on the undisbursed loan amount.
Source: Asian Development Bank estimates.

22. KVK has requested a regular loan of up to T94.42 billion from ADB's ordinary capital resources to help finance the project. The loan, to be guaranteed by the Republic of Kazakhstan, in tenge will have a term of 20.5 years, including a grace period of 5 years; an interest rate equal to the sum of ADB's cost of funding, plus an effective contractual spread for sovereign-guaranteed loans of 0.50% per year; and a commitment charge of 0.15% per year on the undisbursed loan amount. The loan is expected to be disbursed in 8–10 tranches, each for $20 million minimum in tenge equivalent. Subject to market conditions, ADB will provide tenge financing to fund the loan by amortized bonds with maturities of up to 10 years. ADB will also be able to provide financing in currencies where it can effectively intermediate, such as United States dollar. Based on straight-line repayment method, the average loan maturity is 13 years, and there is no maturity premium payable to ADB.

23. The summary financing plan is in Table 2. ADB will finance the expenditures in relation to civil works, goods, consulting services, and project management, including recurrent project management costs and 75% of contingency costs, inclusive of taxes and duties. KVK will contribute the balance to cover financial charges and 25% of contingency costs.

Table 2: Summary Financing Plan

Source	Amount (T billion)	Amount ($ million)	Share of Total (%)
Asian Development Bank			
Ordinary capital resources (regular loan in local currency)	94.42	249.80	77.85
Republican State Enterprise Kazvodkhoz	26.87	71.08	22.15
Total	**121.29**	**320.88**	**100.00**

Source: Asian Development Bank estimates.

24. Climate adaptation is estimated to cost $40.13 million and comprises structural and nonstructural components to improve the resilience and sustainability of the investment under future climate changes and variability, including training on monitoring of climate impacts, use of water-efficient drip irrigation, canal lining to reduce water loss, and establishment of SCADA.[19] ADB will finance 100% of adaptation costs.

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

E. Implementation Arrangements

25. The implementation arrangements are summarized in Table 3 and described in detail in the PAM (footnote 18).

Table 3: Implementation Arrangements

Aspects	Arrangements		
Implementation period	January 2020–December 2024		
Estimated completion date	31 December 2024		
Estimated loan closing date	30 June 2025		
Management			
(i) Oversight body	Project Steering Committee: vice minister of Ministry of Ecology, Geology and Natural Resources (chair); ministries of finance and national economy, Committee for Water Resources (members)		
(ii) Executing agency	KVK		
(iii) Key implementing agency	KVK		
(iv) Implementation unit	KVK branch offices in East Kazakhstan, Karaghandy, Kyzylorda, and Zhambyl		
Procurement	Open competitive bidding (internationally advertised)	5 contracts	$135,745,442
	Open competitive bidding (nationally advertised)	7 contracts	$39,499,373
	Request for quotations	6 contracts	$642,290
Consulting services	Quality and cost-based selection (90:10)	198 person-months international and 3,677 person-months national	$20,430,160
	Consultant's qualification selection	3 contracts	$392,000
	Least-cost selection	1 contract	$112,000
Retroactive financing and/or advance contracting	Advance contracting and retroactive financing will be used for (i) consulting services; (ii) goods and works; and (iii) recruitment of project management office staff and provision of training. The maximum amount of eligible expenditures for retroactive financing is $50 million, the equivalent of 20% of the total ADB loan, incurred before loan effectiveness but not more than 12 months before the signing of the loan agreement.		
Disbursement	The loan proceeds will be disbursed following ADB's *Loan Disbursement Handbook* (2017, as amended from time to time) and detailed arrangements agreed between the government and ADB. Since it is a local currency loan, a special arrangement of advance fund procedure in tenge with a minimum $20 million equivalent for each withdrawal will be used for the project. A comprehensive action plan was agreed with KVK to ensure that the advance fund is used for the project's intended purpose.		

ADB = Asian Development Bank, KVK = Republican State Enterprise Kazvodkhoz.
Source: Asian Development Bank.

III. DUE DILIGENCE

A. Technical

26. A national design entity prepared the project taking into account the recommendations of the transaction technical assistance (TA) consultants and following applicable Kazakh guidelines and regulations. The project feasibility study considered several alternatives and identified the most suitable after due consideration of the irrigation systems' performance, cost effectiveness, and O&M requirements. The technical feasibility of the project was confirmed to be adequate after detailed examination of local conditions, including current and projected climate variables, and availability of water resources. Key adaptation measures in the project design include capacity development of the project beneficiaries and KVK staff, covering various aspects of climate

change, rehabilitation and construction of water metering structures, establishment of SCADA systems, lining of irrigation canals, and development of drip irrigation.

B. Economic and Financial

27. The economic internal rates of return (EIRRs) were estimated for each project province and for the entire project. The EIRRs are 24.2% for East Kazakhstan, 14.8% for Karaghandy, 27.3% for Kyzylorda, and 17.8% for Zhambyl. The EIRR of the project is 25.1%. Sensitivity analyses show that the EIRRs for each province and the project are robust against adverse changes in benefits and costs. A sensitivity analysis was also undertaken to assess the viability of irrigation rehabilitation at the provincial level if the expected shift in cropping patterns to higher-value crops does not occur, and the projected increase in crop yields is not achieved. In both cases, provincial and project viability are not significantly affected.

28. KVK's financial performance from 2014 to 2018 shows stable earnings before income tax, depreciation, and amortization (EBITDA) margin. The company's debt level is historically low with a 3% ratio of long-term debts to long-term assets. However, with capital investment gradually increasing since 2017, KVK needs to adjust the water tariff to cover the investment cost. The financial analysis assumes that KVK will adjust the water tariff in line with tariff regulations for full cost recovery when obtaining loans from international institutions.[20] The financial projection shows that KVK is financially sustainable since revenues from sales exceed its operational costs. Water supply services and water facilities are the main revenue source. This revenue stream will improve with further upgrades to utilities and infrastructure, and further agricultural development.

29. The project is sustainable economically and financially. KVK and its branch offices in the four provinces will be strengthened by the provision of consulting services and necessary equipment to improve their asset management, tariff planning, and O&M of irrigation and drainage networks. The project will enhance KVK's financial position by improving its main revenue stream from water supply and other services. A social survey conducted by the TA consultants indicated that farmers are aware of the tariff structure and considered the tariffs fair and affordable. The project will also strengthen agricultural cooperatives to help farmers diversify from low-value to high-value crops, thereby increasing their profit margins and making the farmers more affordable, which will lead to a virtuous cycle of improvement in irrigation service delivery, crop production, farmer income, and ability and willingness to pay.

C. Governance

30. A financial management assessment of KVK was conducted by the TA consultants and the project team to assess its capacity to implement the project financially. The financial management assessment concluded that the pre-mitigation risk is *substantial*. Although KVK staff have experience with development partners' projects, they lack experience with ADB-financed projects, disbursement procedures, and financial management requirements. ADB agreed on an action plan with KVK to mitigate the risk and enhance KVK's financial management.

31. A procurement risk assessment of KVK was undertaken by the project team to evaluate its capacity for conducting and managing procurement activities. The project procurement risk was rated *high* because KVK has the following procurement weaknesses: (i) no experience with ADB-financed projects and unfamiliarity with ADB procurement guidelines and procedures; (ii)

[20] Order No. 710 approved by the Ministry of National Economy on 24 November 2015. Tariffs of products and services of natural monopolies in the country (such as KVK) are based on a cost-plus-fee principle.

lack of qualified national contractors that are familiar with international financial institutions' procurement requirements; and (iii) inadequate ethics and anticorruption measures. ADB agreed on an action plan with KVK to mitigate these risks.

32. Integrity due diligence on KVK identified no significant integrity risks. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the Government of Kazakhstan and KVK. The specific policy requirements and supplementary measures are described in the PAM (footnote 18).

D. Poverty, Social, and Gender

33. A poverty, social, and gender assessment was conducted by the TA consultants and the project team during project preparation, and the project has several measures built in to ensure social inclusion. The project is expected to reduce poverty among the local populations by making the supply of irrigation water more reliable and introducing advanced farming technologies. The project will directly benefit the well-being of the local populations who rely on farming as an important source of income. Both men and women are involved in farming, mainly through peasant farms. Households in the project-covered areas are mostly large rural families that are more at risk of poverty, so addressing the problem of low agricultural yields and low farm income is particularly important.

34. Six project disclosure and public consultations were conducted by the TA consultants and project team for all subprojects in the four project provinces. Farmers and residents from all the project's districts participated in the public consultations, which were chaired by the heads and deputy heads of the districts, KVK provincial branches, and local governments. Farmers and residents expressed their need for the project and raised questions or made suggestions on its design and implementation. ADB and KVK will hold further consultations on the detailed design and during implementation to ensure that local people participate in and benefit from the project activities.

35. The project is classified *effective gender mainstreaming*, and a gender action plan was prepared by KVK with TA consultants' assistance. Based on the social and gender assessment conducted during project preparation, gender entry points for the project outputs include (i) women's participation (30%) in public consultations in all project phases; (ii) women-owned and/or -led farms (20%) directly benefiting from rehabilitated irrigation infrastructure; (iii) women farmers' participation in training relevant to water management, agricultural practices, and operation and use of water metering devices and other digital technologies; (iv) a gender diagnostic study of KVK; and (v) institutionalized reporting of the project's gender mainstreaming performance.

E. Safeguards

36. In compliance with ADB's Safeguard Policy Statement (2009), the project's safeguard categories are as follows.[21]

37. **Environment (category B).** KVK, with help from TA consultants, prepared four consolidated initial environmental examination (IEE) reports, each for the project provinces, following the Safeguard Policy Statement. The IEEs established that no project irrigation schemes are within or in proximity to specially protected areas or historical and cultural sites. Among the likely adverse impacts of the project during construction are soil erosion and surface water

[21] ADB. Safeguard Categories.

pollution, air quality and noise pollution, and construction waste. However, because of the rehabilitative nature of the project's physical activities, which will be contained within the rights-of-way of the canals, the environmental impacts during construction will be site-specific and temporary. During operation, there is a risk of improper use of pesticides and fertilizers resulting in water contamination. The IEEs include environmental management plans that will be implemented through site-specific environmental management plans prepared by contractors and approved by the construction supervision consultants and the project implementation units for each province. The environmental management capacity of KVK is inadequate, and consultants will assist KVK in building up its potential through workshops and on-site training on environmental management. The project management office will also include an environment officer to manage the implementation of the environmental management plans. Public consultations on the project were conducted by the TA consultants in all four provinces from November 2018 to February 2019.

38. **Involuntary resettlement (category C).** Due diligence identified no land acquisition and resettlement impacts. Due diligence looked into the (i) rehabilitation of existing 549 canals, 23 pipelines, and 43 drain ditches in 245 irrigation schemes to be supported by the project; and (ii) construction of the KVK headquarters building in Nur-Sultan, the capital city. It found that the canals and ditches are state-owned and the land for the construction of the KVK building is owned by the municipality. Project works include rehabilitation of the irrigation canals to their original designs (with and without lining) without widening or changing their rights-of-way, routes, layouts, and capacities. Following the main principle and objective of the Safeguard Policy Statement, the project design incorporated appropriate civil works technologies to avoid any adverse impact. The details were discussed in the due diligence report and their implementation will be monitored and reported by KVK through semiannual and annual social safeguard reports.[22] A grievance redress mechanism has been established, including appointment of the staff of district and provincial authorities as well as provincial and central KVK staff. Disclosure and public consultations were carried out by the TA consultants and project team in all project areas in line with Safeguard Policy Statement requirements, and will continue to take place during the project implementation. Since KVK is new to ADB-financed projects, ADB will arrange capacity building workshops and on-the-job-training for KVK staff on social safeguards.

39. **Indigenous peoples (category C).** No ethnic minority communities are present in the project area, and the project does not trigger ADB's policy requirements on indigenous peoples under the Safeguard Policy Statement.

F. Summary of Risk Assessment and Risk Management Plan

40. Significant risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.[23]

[22] Due Diligence Report on Involuntary Resettlement and Indigenous Peoples Impact (accessible from the list of linked documents in Appendix 2).
[23] 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
Insufficient numbers of qualified staff make it difficult to efficiently undertake the procurement required to implement the project.	A PMO will be established with qualified procurement staff. The PMO will recruit implementation consultants, including procurement specialists to assist in the procurement activities. Intensive training on ADB procurement policies and procedures will be provided before procurement actions.
Corrupt practices may affect procurement and implementation.	ADB will arrange seminars on integrity and anticorruption measures for KVK staff. Major procurement packages will be reviewed beforehand by ADB, and procurement results will be published on KVK's website. All advertisements for procurement will be posted on the national e-procurement portal in addition to the advertisements through the ADB website, to ensure transparency and nondiscrimination.
O&M of infrastructure may be insufficient or unsustainable because of lack of capacity or budget.	KVK's financial position will be strengthened by improving its main revenue stream from water supply and other services. The project will improve KVK's O&M capacity by providing consulting services and necessary equipment. The consultants will assist KVK in developing an asset management plan and reviewing irrigation tariffs, targeting full cost recovery. Covenants on debt service coverage ratio and operating ratio are included in the loan agreement.
Advance funds may be used for unintended purposes.	KVK will deposit the funds into a bank with a good credit rating. ADB will conduct annual financial management reviews, and KVK will liquidate the advance account monthly.

ADB = Asian Development Bank, KVK = Republican State Enterprise Kazvodkhoz, O&M = operation and maintenance, PMO = project management office.
Source: Asian Development Bank.

IV. ASSURANCES

41. The government and KVK have assured ADB that the 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.

42. The government and KVK have agreed with ADB on certain covenants for the project, which are set forth in the draft guarantee and loan agreements.

V. RECOMMENDATION

43. 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 up to T94,424,000,000 to the Republican State Enterprise Kazvodkhoz, to be guaranteed by the Republic of Kazakhstan, for the Irrigation Rehabilitation Project, from ADB's ordinary capital resources, in regular terms, with interest equal to the sum of ADB's cost of tenge funding and the contractual spread for sovereign-guaranteed loans; for a term of 20.5 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 guarantee agreements presented to the Board.

Takehiko Nakao
President

16 August 2019

DESIGN AND MONITORING FRAMEWORK

Impact the Project is Aligned with Contribution of agricultural production to GDP increased (Strategy Kazakhstan 2050)[a]			
Results Chain	**Performance Indicators with Targets and Baselines**	**Data Sources and Reporting Mechanisms**	**Risks**
Outcome Farm productivity increased in East Kazakhstan, Karaghandy, Kyzylorda, and Zhambyl provinces	By 2024: a. Average crop yield increased to 1.7 t/ha for wheat, 5.4 t/ha for rice, and 25.0 t/ha for potato (2018 baseline: 1.2 t/ha for wheat, 4.7 t/ha for rice, and 19.0 t/ha for potato) b. Cropping pattern shifted to 50% high-value crops (2018 baseline: 30% high-value crops) c. Irrigated area service by KVK increased to 1,571,000 ha (2018 baseline: 1,400,000 ha)	a–b. Yearly statistics of the Ministry of Agriculture and the Committee for Water Resources c. KVK annual report	Unexpectedly low rainfall causes severe water shortage.
Outputs 1. Irrigation infrastructure rehabilitated and/or improved	By 2024: 1a. At least 20% of total farms supported by the project led by women (2018 baseline: not applicable) 1b. 1,976 km of earth canals rehabilitated and/or improved (2018 baseline: 0) 1c. 1,064 km of lined canals, flumes, and pipelines rehabilitated and/or improved (2018 baseline: 0) 1d. 4,185 hydraulic structures rehabilitated and/or improved (2018 baseline: 0) 1e. Drip irrigation system established on 9,300 ha (2018 baseline: 0) 1f. 24 SCADA systems installed at key points of irrigation networks (2019 baseline: 0)	1a–f. Quarterly project implementation progress reports by KVK's branch offices in East Kazakhstan, Karaghandy, Kyzylorda, and Zhambyl; KVK's consolidated quarterly project implementation progress reports and annual reports; and ADB review missions' aide-mémoires	Extreme climatic and geophysical hazards adversely affect construction.
2. Water management improved and beneficiaries' capacity enhanced	By 2024: 2a. A pilot system to monitor the performance of the project irrigation systems using remote sensing technology established (2018 baseline: 0) 2b. 70% of beneficiaries, at least 30% of them women, reported and/or demonstrated improved skills in irrigated agricultural practices (2018 baseline: not applicable) 2c. 70% of beneficiaries, at least 30% of them women, reported and/or demonstrated improved skills or	2a–c. Quarterly project implementation progress reports by KVK's branch offices in the East Kazakhstan, Karaghandy, Kyzylorda, and Zhambyl provinces; KVK's consolidated progress reports; and ADB review missions' aide-mémoires	

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
	knowledge in monitoring climate change and adopting proactive and reactive responses (2018 baseline: 0) By 2024:		
3. KVK's capacity strengthened	3a. KVK asset condition register launched, and asset management plan approved and implemented (2018 baseline: not applicable) 3b. 20 KVK staff, at least 30% of them women, reported and/or demonstrated improved skills or knowledge in irrigation system and business management (2018 baseline: not applicable) 3c. 20 KVK staff reported improved skills or knowledge in monitoring climate change impacts (2018 baseline: not applicable) 3d. KVK branch offices provided with 160 additional units of O&M equipment for the project area (2018 baseline: 0) 3e. KVK headquarters' office building and KVK's East Kazakhstan branch office building constructed and operational (2018 baseline: 0)	3a–e. Quarterly project implementation progress reports by KVK's branch offices in the East Kazakhstan, Karaghandy, Kyzylorda, Zhambyl provinces; and KVK's consolidated progress reports; and ADB review missions' aide-mémoires	

Key Activities with Milestones

1. Irrigation infrastructure rehabilitated and/or improved

1.1 Prepare bidding documents for the first set of irrigation schemes (design ready) (Q3 2019–Q4 2019)
1.2 Recruit design and construction supervision consultants (Q3 2019–Q1 2020)
1.3 Prepare the technical designs for all irrigation schemes (Q1 2020–Q1 2021)
1.4 Conduct procurement activities for civil works and equipment (Q3 2019–Q4 2023)
1.5 Award contracts for rehabilitation and improvement works and equipment (Q1 2020–Q2 2024)
1.6 Implement all civil works construction and equipment installation (Q1 2020–Q3 2024)
1.7 Conduct commissioning and test operation (Q1 2021–Q4 2024)

2. Water management improved and beneficiaries' capacity enhanced

2.1 Select a subproject and pilot-test performance measurement using remote sensing and satellite technology (Q3 2020–Q4 2021)
2.2 Provide consulting services and training for establishing agriculture cooperatives (Q1 2021–Q4 2024)
2.3 Procure and hand over basic furniture and equipment to agriculture cooperatives (Q2 2021–Q4 2023)
2.4 Conduct training of farmers, at least 20% of them women, to improve water productivity and monitoring of climate change impacts (Q1 2021–Q4 2024)

3. KVK's capacity strengthened

3.1 Procure O&M equipment for KVK branch offices (Q1 2021–Q2 2024)
3.2 Develop asset management plan, including O&M, irrigation tariff reforms, and water allocation (Q2 2020–Q2 2022)
3.3 Conduct training on asset management of canals and appurtenant structures, metering, and water allocation and distribution systems (Q1 2022–Q4 2024)
3.4 Conduct training for key staff from the KVK head office, including all female key staff, on service-oriented water and irrigation management, including conflict resolution between water users (Q2 2020–Q4 2024)
3.5 Design, procure, and construct the KVK headquarters building and the office building of the KVK East Kazakhstan branch office; and repair workshops (Q1 2021–Q1 2024)

3.6 Conduct a study tour for KVK staff and project beneficiaries to learn advanced irrigation management techniques (Q2 2023–Q3 2023)
Project Management Activities Establish PMO and PIUs (Q4 2019–Q1 2020) Appoint and/or recruit PMO and PIU staff, with equipment and office space provided (Q1 2020–Q3 2020) Conduct socioeconomic surveys at the beginning (Q1 2020), middle (Q3 2022), and end (Q4 2024) of project implementation Conduct annual audits of the project accounts within 6 months of the end of the previous fiscal year (Q1 2021–Q4 2024) Monitor project implementation performance and prepare quarterly progress reports (Q2 2020–Q4 2024) Carry out key activities of the GAP (Q1 2020–Q4 2024) Conduct and monitor activities of the environmental management plan and social safeguards (Q1 2020–Q4 2024) Conduct annual and midterm project reviews (Q2 2020–Q4 2024)
Inputs ADB: T94.42 billion ($249.80 million) (regular OCR loan) KVK: T26.87 billion ($71.08 million)
Assumptions for Partner Financing Not applicable

ADB = Asian Development Bank, GAP = gender action plan, GDP = gross domestic product, ha = hectare, km = kilometer, KVK = Republican State Enterprise Kazvodkhoz, O&M = operation and maintenance, OCR = ordinary capital resources, PIU = project implementation unit, PMO = project management office, Q = quarter, SCADA = supervisory control and data acquisition, t = ton.

[a] Official Site of the President of the Republic of Kazakhstan. 2012. Address by the President of the Republic of Kazakhstan, Leader of the Nation, N.A. Nazarbayev on Strategy "Kazakhstan-2050": New Political Course of the Established State. 14 December.

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=50387-001-3

1. Loan Agreement
2. Guarantee Agreement
3. Sector Assessment (Summary): Agriculture, Natural Resources, and Rural Development
4. Project Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Economic and Financial Analysis
8. Country Economic Indicators
9. Summary Poverty Reduction and Social Strategy
10. Risk Assessment and Risk Management Plan
11. Climate Change Assessment
12. Gender Action Plan
13. Initial Environmental Examination: East Kazakhstan Province Subprojects
14. Initial Environmental Examination: Karaghandy Province Subprojects
15. Initial Environmental Examination: Kyzylorda Province Subprojects
16. Initial Environmental Examination: Zhambyl Province Subprojects

Supplementary Documents

17. Due Diligence Report on Social Safeguards
18. Financial Management Assessment
19. Project Procurement Risk Assessment Report
20. Detailed Economic and Financial Analysis
21. Climate Risk and Vulnerability Assessment Report
22. Strategic Procurement Planning Report