



## 1. Project Data

<b>Project ID</b> P127764	<b>Project Name</b> S KARAKALPAKSTAN WATER RES MGMT IMPR	
<b>Country</b> Uzbekistan	<b>Practice Area(Lead)</b> Water	
<b>L/C/TF Number(s)</b> IBRD-83890,IDA-54900	<b>Closing Date (Original)</b> 30-Sep-2021	<b>Total Project Cost (USD)</b> 168,545,960.78
<b>Bank Approval Date</b> 12-Jun-2014	<b>Closing Date (Actual)</b> 31-Jul-2023	
	<b>IBRD/IDA (USD)</b>	<b>Grants (USD)</b>
Original Commitment	260,790,000.00	0.00
Revised Commitment	214,260,575.18	0.00
Actual	168,530,693.21	0.00

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## 2. Project Objectives and Components

### a. Objectives

The project objective as written in the International Bank for Reconstruction and Development (IBRD) Financing Agreement (p.4) dated October 29, 2014, and the Project Appraisal Document (p.11) is to restore irrigation and improve water management in the project area in a sustainable and financially efficient manner.

This ICR Review will assess the achievement of the following PDOs:

1. To restore irrigation in the project area in a sustainable and financially efficient manner.



2. To improve water management in the project area in a sustainable and financially efficient manner.

**b. Were the project objectives/key associated outcome targets revised during implementation?**

No

**c. Will a split evaluation be undertaken?**

No

**d. Components**

The project had three components:

**Modernization of the Irrigation Network.** Appraised cost was US\$273 million (IDA: US\$192.54 million, IBRD: US\$14.81 million, recipient: US\$66.5 million) with actual spending of US\$154.47 million. The component invested in infrastructure to restore the irrigated area in South Karakalpakstan in a financially efficient manner. Activities included constructing and modernizing water control structures, lining canals, and shifting to a gravity-based system to minimize water loss and boost service efficiency. Additionally, it implemented a Supervisory Control and Data Acquisition (SCADA) system for performance monitoring, and executed environmental and social management, as well as resettlement plans for safeguarding measures.

**Modernization of Agriculture.** Appraised cost was US\$55.43 million (IDA: US\$43.04 million: IBRD: US\$3.15 million: recipient: US\$9.24 million) with actual spending of US\$9.86 million. This component was designed to support improvements in agricultural production practices to better manage water resources. Activities included strengthening local institutions, supporting crop intensification and diversification, promoting mechanization for cotton harvesting, and land leveling, as well as communication campaigns to disseminate information effectively.

**Project Management, Monitoring, and Evaluation.** Appraised cost was US\$8.15 million (IDA: \$6.92 million, IBRD: \$0.33 million, recipient: \$0.9 million) with actual IDA spending of US\$4.2 million. This component focused on enhancing the implementing agency's capacity to manage the project effectively and perform monitoring and evaluation. The aim was to ensure robust project oversight, accurate data collection, and effective use of resources throughout the project duration.

**e. Comments on Project Cost, Financing, Borrower Contribution, and Dates**

**Project Cost:** The project cost, inclusive of borrower contribution, was estimated at US\$337.43 million at the time of appraisal. In June 2017, the project cancelled the undisbursed IBRD loan balance of US\$18.22 million and undisbursed IDA credit balance of \$27.7 million. This was in response to the government's request as it aimed to complete the works through its own resources. The actual project cost at completion was US\$200.14 million.

**Financing:** At the appraisal stage, sources of financing included an IBRD loan of US\$18.29 million; and an IDA credit of US\$242.5 million. Following the cancellation of some funds in 2017, the IBRD loan was revised to US\$45,725 and the IDA credit to US\$214,21 million. The actual disbursements included US\$45,725 from the IBRD loan and US\$168.48 million from the IDA credit.



**Borrower Contribution:** The borrower contribution at appraisal was US\$76.64 million. The actual contribution at the time of completion was US\$31.6 million, which was allocated to component 1. The actual contribution excludes government's contribution in terms of taxes and duties forgone which was initially included in the borrower contribution estimate.

**Dates:** The project was approved on June 12, 2014, and became effective nearly a year later on April 7, 2015. A mid-term review was carried out on October 26, 2018. The original project closing date was September 30, 2021, which was extended by 22 months to July 31, 2023.

**Project Restructuring and Additional Financing:** The project was restructured four times.

**First Restructuring (April 7, 2015).** A level 2 restructuring was completed to waive one of five project effectiveness conditions. The agreement required a signed agreement between the Ministry of Finance and Uzpakhtasanoat to define the terms of providing cotton harvesting equipment and services and other associated equipment to Uzpakhtasanoat for the purposes of cotton harvesting mechanization. The condition was waived because the Government of Uzbekistan established the Uzbekistan Agricultural Machinery company (UzAgMesh) to own and sub-lease cotton harvesters, while Uzpakhtasanoat was to continue to manage cotton ginning and handle only pre-cleaning equipment to maintain the quality of mechanically harvested cotton. At the time of restructuring, the Bank had not received a contract on mechanization between MOF and the new entity, and it noted significant risks to waiving the condition due to concerns about UzAgMesh's organizational capacity. Nonetheless, the waiver was completed to allow for project activities to commence.

**Second Restructuring (June 28, 2019).** A Level 2 restructuring was completed to update the financing agreement to reflect institutional and organizational changes, revise the results framework based on updated information, and adjust the disbursement projections due to implementation delays. The legal agreements were revised to reflect the new implementing agency, the Agency for Implementation of Projects in the field of Agroindustry and Food Security (UZAIFA) due to a government restructuring that divided the Ministry of Agriculture and Water Resources into two entities. Additionally, the deadline for installing real-time flow measuring stations at the Amu Darya River intakes and escape canals was extended from December 31, 2015, to September 1, 2021, due to contract award delays. In the revised results framework, new intermediary indicators were incorporated, including the extent of canal construction or rehabilitation, the number of civil work contracts, user satisfaction, the operational status of a grievance redress mechanism, and the proportion of female staff in water consumer associations.

**Third Restructuring (May 28, 2021).** Due to delayed effectiveness and persistent procurement delays, seven years after project approval, only six of the 14 civil contracts were on track for completion by the original deadline. This was compounded by the COVID-19 pandemic which reduced labor availability and impacted international staff and contractors. A Level 2 restructuring was therefore completed to extend the project closing date by 15 months to December 31, 2022. Additionally, the target for irrigation demonstrations was reduced from 245 to 25 due to the division of the Ministry of Agriculture and Water Resources, with a new focus on demonstrations supported financially by the borrower's agricultural modernization efforts.

**Fourth Restructuring (October 19, 2022).** A level 2 restructuring extended the project closing date by seven months from December 31, 2022, to July 31, 2023. Eight years after project approval, only six of the 17 active civil works contracts were expected to be complete on time. This was due to delays in completing government's feasibility studies post-bank approval, slow government decision to sign the financing



agreement, and protracted preparations of detailed designs and bidding documents. There were additional issues related to tendering, cost escalations, institutional reforms, and disruptions from the COVID-19 pandemic and civil unrest in the project area, collectively setting the project back by 18-24 months.

### 3. Relevance of Objectives

#### Rationale

**Country Context:** Uzbekistan experienced rapid economic growth and declining poverty in 2012-13, yet rural poverty remained high at 30%. Agriculture was dependent on an outdated irrigation network. Inefficient water use, driven by deteriorating infrastructure, posed sustainability challenges, especially for cotton production that was heavily reliant on water. Irrigation issues led to land salinization, food insecurity, and forced migration. The government was working on agricultural modernization and reduction of forced labor. Farmers were encouraged to form Water Consumer Associations (WCAs) to manage smaller canals and pumping stations, while the public sector handled larger canals. However, high dependence on pumping and costly operations undermined the WCAs' financial viability. Limited profits from cotton further hindered farmers' ability to cover these high O&M costs.

**Previous Bank experience in the sector/country:** The World Bank supported water resource management and horticultural diversification in Uzbekistan through policy dialogue, analytic work, and investments like the Drainage, Irrigation and Wetlands Improvement Project (DIWIP), the Rural Enterprise Support Project (RESP), and the Fergana Valley Water Resources Management Project. The former projects rehabilitated the drainage system in drainage system in the South Karakalpakstan project area and introduced gravity-based flow. The Project is more ambitious and builds on the results achieved through DIWIP. While DIWIP managed to suspend two major pumping stations the project aimed to suspend three additional major stations and more than 20 floating stations. It also introduced measures to end child labor.

The Bank worked closely with the Asian Development Bank to support the government to mechanize agriculture, focusing on cotton. To tackle child and forced labor, the World Bank engaged in dialogue, promoted cotton diversification and mechanization, strengthened project-level mitigation measures with Third Party Monitoring and Feedback Mechanism, and supported crop diversification and agricultural mechanization through various investment operations.

**PDO alignment to Country Priorities:** At the time of project appraisal, the government of Uzbekistan had announced its plans to fully mechanize cotton harvesting by 2016. The Industrial Modernization and Infrastructure Development Program (2011-15) highlighted four priority areas including a focus on efficient irrigation infrastructure, competitive industries including agro-processing, and diversified economy. The PDO was aligned with these objectives and remains relevant to the country's current water strategy, Development of Water Resources of the Republic of Uzbekistan for 2020–2030. The strategy emphasizes the need to improve irrigation efficiency, increase water- and energy-efficient technologies, reduce in power consumption by pumping stations (through conversion of electrically pumped networks into gravity fed systems), and improve water monitoring and metering systems in real time.



**PDO alignment to World Bank Strategies:** The Uzbekistan Country Partnership Strategy (CPS, 2012-2015) prioritized water resource management both at the regional and country levels. Under objective 1.2 of the pillar on sustainable infrastructure development, the CPS highlighted the Karakalpakstan Drainage Project in northwest Uzbekistan as a step to upgrading and improving the efficiency of the irrigation and drainage network in one of the country's poorest regions. The latest World Bank Country Partnership Framework (CPF, 2022-2026) notes progress in ending systematic use of child labor in the agriculture sector. The CPF also aims to expand efforts in improving irrigation efficiency across the country based on lessons learned and progress made under this project.

**Level of the Project Development Objective (PDO):** The PDO was formulated at the output and intermediate outcome levels of the results chain. "Restoring irrigation systems" was at the output level, while outcomes focused on financial efficiency, sustainability, and water resource management. Achieving the PDO was expected to lead to enhanced crop diversification, increased crop productivity, reduced maintenance costs, and higher income levels which would in turn lead to food security, climate change adaptation, and economic stability. The PDO was not appropriately pitched to the country's institutional capacity as was evident from the long delay in effectiveness and the protracted procurement and other implementation delays. While the PDO's strategy alignment is high, it was overly ambitious in the operational context of institutional capacity weaknesses.

Overall, the relevance of project objectives is rated Substantial.

## Rating

Substantial

## 4. Achievement of Objectives (Efficacy)

### OBJECTIVE 1

#### Objective

To restore irrigation in the project area in a sustainable and financially efficient manner.

#### Rationale

##### Theory of Change

Project activities included construction of the Bustan Canal, rehabilitation of existing canal systems including 90 main structures (control, cross-drainage, and bridges) and 20 distribution inter-farm canals, and installation of a Supervisory Control and Data Acquisition (SCADA) system. The expected outputs were: Bustan Canal constructed, existing canal systems in the project area rehabilitated, and automated monitoring system established. These outputs were to lead to reduced second-level pumping, systems developed for volumetric measurement and management, improved irrigation efficiency, reduced greenhouse gas emissions, and improved public information on water abstraction. In the long run, expected results included enhanced agricultural productivity, sustainable water resource management, increased crop diversification, reduced



operational costs, better resilience to climate change, and overall improved livelihoods for the farming communities.

The theory of change had a logical flow and adequate causal links. The sequence from infrastructure development to enhanced irrigation efficiency and water management was coherent. The construction and rehabilitation efforts aimed to address immediate technical and operational challenges, while the installation of SCADA facilitates advanced monitoring and management. These outputs would lead to reduced pumping requirements, improved volumetric measurement, and better public information on water usage. However, the success of these causal links relied heavily on key assumptions such as the availability of financial resources, adoption by farmers, institutional capacity, and supportive policies. Some of these assumptions proved to be critical barriers. For example, farmers did not adopt cotton harvesting mechanization approaches, and institutional capacity often fell short in terms of procurement.

### **Outputs**

- 133 kms of main canals were rehabilitated (including reprofiling and water control structures), exceeding the target of 35kms which was introduced in 2019. This indicator was not part of the appraisal document but added later in 2019 restructuring.
- 694 kms of secondary canals were rehabilitated exceeding the target of 300 kms that was introduced in 2019. This indicator was not included in the appraisal document but added in the 2019 restructuring.
- 19 civil works contracts were awarded under the project exceeding the target of 6 introduced in 2019.
- 64,420 water users were provided with new/improved irrigation and drainage services exceeding the original target of 41,000. Of these users, 31,560 were female water users exceeding the original target of 27,000.
- Irrigation and drainage services were improved in 94,000 hectares of land, exceeding the original target of 75,000 hectares as well as the revised target of 89,000.
- By reducing the use of pumping stations, the decrease in energy consumption was 61,404 MW meeting the target of 60,000 MW.
- An irrigation water distribution schedule was prepared to formalize allocations to water users along the irrigation network.
- A dam safety plan for Tuyamuyun dam was prepared and submitted to the government

### **Outcomes**

- Improved irrigation water delivery service (score of 2.5 achieved against original target of 2.5). Quality of irrigation service delivery was measured based on the Mapping System and Services for Canal Operation Techniques (MASSCOTE), a stepwise methodology to evaluate and analyze different components of an irrigation system.
- The WCAs demonstrated an increase in the collection of irrigation service fees from water users to cover O&M costs. The collection rate increased from a baseline of 36.4 percent in 2016 to over 55 percent in 2021, thus exceeding the targeted 50 percent cost recovery.
- Annual public and WCA expenditures for pumping reduced by 78% nearly achieving the target of 80%.



The project largely achieved its targets, exceeding goals for canal rehabilitation, civil works contracts, and the number of water users receiving improved services. The quality of irrigation service was standardized using the MASSCOTE index. Targets for hectares of land with improved irrigation were also surpassed. Reductions in energy consumption and increased fee collection by WCAs indicated progress towards financial efficiency and sustainability. According to government policy, WCAs were expected to cover 100% of rehabilitation costs, with the government funding main and inter-farm system upgrades. While the project met its 50% cost recovery target, this fell short of the government's requirement. Factors such as climate change and droughts may impact cost recovery. Despite this, it is anticipated that farmers can meet O&M fees, which are less than 2% of net farm income for private farms.

Overall, despite the extended implementation timeline and persistent delays in procurement, the project managed to complete civil works at the time of completion and met or exceeded most of its targets. The results were largely attributable to the project because the intervention included infrastructure rehabilitation but also implementation of water management technologies, capacity building, and community-based operational model. The project's efficacy toward this objective is rated Substantial.

**Rating**  
Substantial

## **OBJECTIVE 2**

### **Objective**

To improve water management in the project area in a sustainable and financially efficient manner.

### **Rationale**

#### **Theory of Change**

Project activities included conducting farmer field-schools and demonstrations, providing training and technical support to farmers on credit access, providing modern tools and maintenance equipment to WCAs, conducting a financial viability assessment of WCAs, preparing a business plan for WCAs, supporting purchase of mechanized cotton harvesters, financing purchase of cleaning equipment for the ginneries to maintain quality of mechanically harvested cotton fiber, capacity building for operation and maintenance of the machinery, establishing quotas for women's participation in WCAs, and conducting awareness campaigns to inform farmers about the implications of cotton harvest mechanization in terms of crop husbandry methods.

Expected outputs included: farmers trained on non-cotton and non-wheat crops, awareness campaigns completed, cotton harvesting mechanization equipment and cleaning equipment procured, trainings completed, and business plans and assessments on WCAs completed.

In the medium term, the outputs were expected to lead to: child labor reduced or eliminated in the cotton sector, agricultural practices improved (i.e., better use of scale up land leveling and deep dripping), irrigation efficiency improved, cotton harvesting mechanized, crop diversification beyond cotton and wheat, crop intensification, farm productivity increased, and financially viable business models adopted by WCAs. In the long term, the project is expected to improve water management in a financially viable and sustainable



manner, enhance climate change adaptation among farmers in the project areas, improve food security and increase income for project beneficiaries.

The theory of change relied on a few key assumptions. For example, willingness of farmers to adopt new practices and their confidence in the benefits of diversification; reliable market access and supportive government policies, adequate infrastructure for storage, transportation, and processing of alternative crops; and economic viability of the new crops being introduced. Also training WCAs on available credit lines may not necessarily lead to actual use of credit lines due to other factors such as interest rate affordability, credit accessibility, collateral requirements, and the groups' financial literacy and risk aversion.

Overall, the causal links between the project activities, outputs, and outcomes were logical and valid. The achievement of the project objectives can be attributed to the project's interventions, but critical assumptions were overly optimistic. The project did not track most of these assumptions, making it unclear how significantly they impacted the outcomes. For instance, while Water User Associations (WCAs) were trained on credit options, there was no evidence that they pursued or secured formal loans and credit. Additionally, market linkages, transport, and other related factors which affect farmers' decisions regarding agricultural practices and choice of crops were outside the project's scope and not covered in the monitoring reports.

## Outputs

- 34 operational WCAs were created and/or strengthened exceeding the original target of 25 but falling short of the revised target of 40. Institutional reforms in 2022 consolidated WCAs into Special Services units within district-level irrigation departments, making it impossible to monitor the number of strengthened WCAs. However, these Special Services units still benefited from the capacity-strengthening activities originally targeted at the WCA.
- 798 staff of BVO, PAN-ISA, and LABAIS were trained, exceeding the target of 50.
- 3,366 client days of training was delivered exceeding the original target of 600. Of this, 315 days were delivered to female participants against a target of 120. It is unclear how many participants were female as the number of training days for women is less than 10%.
- 30 demonstrations were established, not meeting the original target of 245 but meeting the revised target of 25. The target was revised quite late in project implementation a year before project closing. The ICR notes (para 93) that this was due to the splitting of the original implementing agency, Ministry of Agriculture and Water Resources, into two separate ministries. As a consequence, demonstrations focused on water resource management were retained while the demonstrations focused on agricultural practices were cancelled.

## Outcomes:

- 28,172 hectares of land were producing non-cotton/non-wheat crops exceeding the target of 8,000.
- 2.7% of cotton area was being harvested mechanically, not meeting the original target of 70% (nearly meeting the revised target of 3%).
- The WCAs demonstrated an increase in the collection of irrigation service fees from water users to cover O&M costs. The collection rate increased from a baseline of 36.4 percent in 2016 to over 55 percent in 2021, thus exceeding the targeted 50 percent cost recovery.
- Annual public and WCA expenditures for pumping reduced by 78% nearly achieving the target of 80%.





The project exceeded several targets, including the creation and strengthening of operational WCAs, extensive training of staff from key organizations, training delivery. Additionally, a substantial amount of land diversified crops away from cotton and wheat, and WCAs demonstrated improvements in fee collection rates. Annual expenditures for pumping were also reduced close to the expected target.

However, the project faced challenges that impacted its overall effectiveness. The consolidation of WCAs into Special Services units made it difficult to monitor the number of strengthened WCAs. Moreover, only 2.7% of the cotton area was harvested mechanically, falling short of the original 70% target. It nearly met the revised 3% target, but that target was established a year before project closing. The number of demonstrations established was far below the original target, meeting only the revised target set late in the project. These indicators were important in measuring the achievement of the PDO.

The project's results in enhancing financial efficiency through WCA's fee collection and expenditure reduction was notable, but the full sustainability of these improvements remains uncertain as the WCAs no longer exist and the operating model of the new entities is unknown. The assumptions discussed above also play a role in sustainability. For example, the level of market demand and availability of storage infrastructure for alternative crops would determine the sustainability of the farmer field-school results. The project fell short in achieving cotton harvesting mechanization which was a key activity towards reduced the need for child labor.

Beyond the results framework, the project also carried out a beneficiary feedback survey in 2017 and 2023 covering 800 households. The survey showed an increase in income levels, water availability for households, crop variety improved, and irrigation reliability also increased. Although the survey was based on beneficiary perceptions which may be impacted by short-term factors, it was carried out at baseline and completions stages and provided a useful measure of beneficiary perceptions.

Overall, the project made progress in certain areas but the inability to meet some key targets and the challenges in monitoring and institutional reforms indicate that the objective of improving water management in a sustainable and financially efficient manner was only partially achieved. Efficacy under this outcome is rated Modest.

**Rating**  
Modest

## **OVERALL EFFICACY**

### **Rationale**

The project achieved substantial progress towards its first objective of restoring irrigation systems, and it achieved modest progress towards its second objective of improving water management systems. The overall efficacy is rate Substantial with significant shortcomings.

### **Overall Efficacy Rating**



Substantial

### 5. Efficiency

**Economic Analysis:** A “with project” and “without project” economic analysis was conducted at appraisal and project closing. The analysis calculated economic benefits from expected production increases, cost savings, employment, and income generation. The PAD analysis estimated agricultural benefits from crop and livestock production increases, non-agricultural savings from reduced pumping and O&M costs, and the costs and benefits of mechanized cotton harvesting. The ICR analysis drew on actual data from 2022 for both scenarios, indicating that production in selected districts had increased by 87% between 2016 and 2022. Using the Herfindahl-Index, the analysis also showed that crop diversity had increased in selected areas compared to 2016. On energy efficiency, it confirmed the PAD projection showing that energy consumption reduced between 2016 and 2022. One element that was missing from the ICR cost-benefit analysis was the expected US\$15million benefit from cotton harvesting mechanization. In terms of timeline, the PAD assessed project benefits for a 30-year period, while the ICR used actual data between 2016 and 2022 and an adjusted set of projections beyond the closing date.

While the Economic Internal Rate of Return (EIRR) in the PAD and ICR were not directly comparable due to differences in timeline and focus areas, the ICR’s EIRR of 15% was based on actual implementation results.

**Administrative Efficiency:** The project was initially planned for five years but was extended by two years. Despite this, it experienced significant cost savings across its main components. The modernization of the irrigation network was completed for US\$186.08 million against an initial budget of US\$273.85 million, benefiting from competitive bidding and local currency devaluation. The second component cost US\$9.86 million instead of the projected US\$55.43 million, primarily due to lower uptake of mechanized cotton harvesting. Project management, monitoring, and evaluation costs were US\$4.2 million, below the US\$8.15 million budgeted. Overall, the project was completed for approximately US\$303 million, 10% below the estimated US\$337 million, with no significant cost overruns.

Overall, the project achieved a favorable EIRR, indicating significant economic benefits in terms of increased agricultural productivity and reduced energy costs by shifting to gravity-fed irrigation. However, it did not fully realize the expected benefits from the adoption of mechanized cotton harvesting. It also demonstrated cost efficiency with actual completion cost being 10% under the original budget. This was largely due to competitive bidding and currency devaluation rather than planned cost-saving measures. The project’s efficiency is rated Substantial.

### Efficiency Rating

Substantial

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

Rate Available?	Point value (%)	*Coverage/Scope (%)
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Appraisal	✓	16.00	0 <input checked="" type="checkbox"/> Not Applicable
ICR Estimate	✓	15.00	0 <input checked="" type="checkbox"/> Not Applicable

\* Refers to percent of total project cost for which ERR/FRR was calculated.

## 6. Outcome

The project was substantially relevant to the country context which faced significant water management and irrigation related challenges. It was well aligned with both the government and World Bank sector strategies. It achieved substantial progress towards its first objective of restoring irrigation systems, and it achieved modest progress towards its second objective of improving water management systems. The project’s overall efficacy is substantial, with significant shortcomings. The project was implemented in an efficient manner with cost-savings and demonstrated economic gains for project beneficiaries. Following OPCS and IEG harmonized guidelines, given the modest rating of one of the objectives, the overall outcome rating is Moderately Satisfactory.

### a. Outcome Rating

Moderately Satisfactory

## 7. Risk to Development Outcome

**Technical Risk:** The project faced a low uptake of cotton harvesting mechanization due to farmers’ preference for existing approaches. There is a substantial risk that the project’s other innovative elements i.e., crop diversification, laser land leveling, deep dripping techniques, and remote monitoring technology may not be utilized to full potential and adequately maintained. Although the project delivered trainings on these elements, there is no discussion in the ICR of how the technical knowhow will be maintained and updated in the future.

**Environmental Risk:** As discussed in the PAD, Uzbekistan already faces water scarcity challenges, and climate change is expected to exacerbate these issues. This can pose significant risks to irrigation systems and rural water supply management, including increased temperatures, altered precipitation patterns, and prolonged droughts, which could exacerbate water scarcity and disrupt irrigation schedules. Extreme weather events can damage infrastructure. The project has taken steps toward enhancing water use efficiency, investing in resilient infrastructure, and adopting sustainable practices. Continued efforts in these areas are essential to mitigate climate impacts.

**Governance Risk:** The project experienced several institutional changes and restructurings during implementation. First, the responsibilities for cotton mechanization procurement shifted from one entity, Uzpakhtasanoat to another agency, UzAgMesh. The project’s legal covenant pertaining to procurement of cotton harvesting equipment needed to be adjusted to reflect this. The implementing ministry was later split into two ministries resulting in a restructuring to revise relevant targets. In the year before project closing, the WCAs were dissolved and absorbed into new district level entities and a new operating model was



introduced. There is a substantial risk that continued institutional changes may affect project results particularly the institutional development and regulatory support aspects.

**Social Risk:** In the context of Uzbekistan, where water is a scarce and valuable resource, there is a substantial risk of elite capture in the community-based organizations (WCAs later merged into Special Services Units). The project established a quota for women's participation in the WCAs for gender inclusion. However, studies have shown that setting participation quotas alone is not sufficient for ensuring voice, representation, and decision-making power. Other vulnerable groups and minorities may also require more intentional interventions for meaningful representation.

## 8. Assessment of Bank Performance

### a. Quality-at-Entry

The timing of the project's preparation was strategic, immediately following the closure of the previous Drainage, Irrigation and Wetlands Improvement Project (DIWIP), which covered the same region. DIWIP activities resulted in suspension of two main pumping stations and redirecting saline drainage water to the Aral Sea. DIWIP introduced gravity-based drainage system and reduced high water tables and enhanced institutional capacities by establishing 21 WCAs, training 1,250 farmers and staff, and conducting 12 demonstrations. Following DIWIP, the project introduced more ambitious interventions to suspend three additional main pumps and 20 other pumps, improve institutional capacity, improve water management systems including through introduction of remote sensing technology, and address dam safety issues. The project's focus on child labor was timely, although related activities were not fully elaborated at appraisal stage. The project area, the Karakalpakstan region, was a highly relevant choice due to its high degree of poverty and significant water security challenges.

During preparation, client capacity assessments on safeguards and fiduciary aspects were carried out and action points were identified. The project activities and geographic scope was clear at the time of appraisal hence safeguards assessments and plans were completed for the key project sites, and detailed plans including environmental social management plans and resettlement action plans were prepared.

The project had 21 legal covenants, which proved excessive and delayed its effectiveness. In addition to slowing project initiation, many covenants needed amendments during implementation due to unrealistic timelines or changing contexts, such as the covenant for cotton harvest mechanization, which faced low farmer acceptance.

The FM assessment noted limited accounting technical capacity and considered the overall FM and control risks to be moderate. Audits of Bank projects were performed by private firms that met Bank's eligibility criteria. The PIU had prior experience with DIWIP project. A few action points were identified in the PAD including updating the project operations manual's FM section, modifying, and updating existing software, hiring/selecting an FM specialist to oversee the PIU's financial activities. Procurement risks were considered high given the arduous contract registration processes, likelihood of political intervention, low competition levels due to high costs, and high perceived levels of corruption. The project



prepared a procurement plan which included early preparation of tender documents, capacity building trainings for the PIU, and establishment of a complaint mechanism for bidders.

The project's M&E framework was practical and defined benchmarks to reflect the theory of change, although a few shortcomings remained in terms of assessing longer term outcomes to capture the project's contribution toward gender, climate change, and citizen engagement.

### **Quality-at-Entry Rating** Moderately Satisfactory

#### **b. Quality of supervision**

The implementation arrangements were initially challenged by a lack of coordination across government ministries, leading to delays. However, the creation of a dedicated Ministry of Water Resources (MoW) in 2018 improved implementation. The MoW became the key implementing partner.

Some adjustments were made during the project to address emerging challenges. For instance, the project faced procurement delays and institutional changes, which were addressed by splitting large contracts and restructuring implementation arrangements. The Bank team was responsive to implementation realities. The mid-term review in 2018 produced a detailed assessment on the status of activities, bottlenecks, and measures required to accelerated implementation. This led to some changes at the restructuring carried out the following year. It reduced the target for number of demonstrations established in response to ministry restructuring and reduced the target for cotton harvesting mechanization although the 2019 restructuring paper did not provide an explanation on the later change. The change in the status of WCAs was not reflected in the project activities or M&E framework.

The task team supported trainings on implementation of environmental and social safeguards, occupational health and safety trainings for contractors. The project used independent consultants and agencies to conduct quality tests for construction works, monitor use of child labor, and implement measures to mitigate environmental impacts. This helped to address quality assurance aspects.

Three task team leaders, based in the country office, oversaw project implementation throughout its lifecycle. This allowed for close supervision and continuous support. Some factors such as Covid-19 impacts, currency depreciation, and delays caused by winter season were outside the control of the Bank and the borrower.

Overall, the Bank team took sufficient measures during project preparation and implementation. Due to design-stage shortcomings such as inadequate community consultations on cotton mechanization, excessive legal covenants, initial coordination challenges, inadequate attention to social inclusion aspects Quality at Entry is rated Moderately Satisfactory, while Quality of Supervision is rated Satisfactory. According to ICR guidance, the lower of the two ratings (of Bank performance in ensuring quality at entry and Quality of supervision) determines the rating of overall Bank Performance. Therefore, the overall Bank Performance rating is Moderately Satisfactory.



## Quality of Supervision Rating

Satisfactory

## Overall Bank Performance Rating

Moderately Satisfactory

## 9. M&E Design, Implementation, & Utilization

### a. M&E Design

The PDO and results framework reflected both output and outcome level indicators and objectives. The PDO was compound and required multiple quantifiable indicators for tracking progress, and this was established to some extent. Some factors affecting the PDO were outside the project scope and influence for example climate change, beneficiary commitment to adopt new practices, and political influence in project interventions. Nonetheless, the M&E design captured the main contributions of the project toward the PDO.

Innovative monitoring tools were introduced including use of the MASSCOTE methodology to assess quality of irrigation service delivery, with a focus on system capacity and behavior (sensitivity); perturbations; water networks and water balances, and the cost of operating the system. A third-party monitoring and beneficiary feedback mechanism was also planned at the time of appraisal although not fully developed yet.

The results framework introduced sex-disaggregated data on water users to measure whether men and women users benefit from water management systems equally. While it included a quota for women's participation in WCAs, this was not sufficient to track meaningful representation, voice, and decision-making power. Similarly, the project did not monitor representation of other vulnerable groups and minorities. Despite its strong focus on child labor and forced labor, it did not include indicators or data sources to measure the use of child labor, nor did it track generation of labor and changes in income levels.

The project carried out a baseline survey during preparation. Despite this, baselines were missing for some indicators: *water users provided with irrigation and drainage services, WCAs created/strengthened, area provided with improved irrigation services, and area of laser land leveling*. Lack of baselines posed attribution challenges and limited the project's ability to fully demonstrate and verify the achievements and effectiveness of the project initiatives in the mentioned areas. The project included an indicator on *dam safety plan developed* but without additional data points on implementation to verify whether the safety aspects were implemented.

### b. M&E Implementation

In 2022, WCAs ceased to exist, and their staff, functions, and assets were absorbed into the district-level Irrigation Departments. The newly centralized O&M functions within the district-level Irrigation Departments were to be financed by a water tax, set on a volumetric basis. Although this change took place quite late in project implementation, it posed monitoring challenges on the sustainability and financial efficiency of community-level water management. The project's two outcome indicators focused on WCAs (WCA expenditures on pumping and WCA fee collection rate) were no longer relevant. The



project assumed that the activities and results focused on WCAs would automatically transfer to the new structure, but this was not tracked through the results framework or data sources beyond the results framework.

The project tracked sex-disaggregated data on water users to measure whether men and women users benefit from water management systems equally, but it remained short in monitoring diversity and inclusion aspects. On child labor, a third-party monitoring scheme was introduced in partnership with the International Labor Organization (ILO). A indicator was added in 2019 on availability of a grievance mechanism, which strengthened the project's the citizen engagement monitoring though it did not track number of cases reported and resolved.

The project carried out a beneficiary feedback survey in February 2017 and again in May 2023, covering 800 households. Although the survey was based on beneficiary perceptions which may be impacted by short-term factors, it was carried out at baseline and completions stages and provided a useful measure of beneficiary perceptions. The survey was a useful complement to gather data on aspects of the theory of change that were not captured in the results framework.

Most indicator targets remained unchanged, and a few were increased during implementation. One target was significantly reduced quite late in implementation: *number of demonstrations established* had a target of 245 which was reduced to 25 in 2022. Following the restructuring of ministries, the project could only implement demonstrations related to irrigation efficiency (such as laser land leveling, deep soil ripping techniques) and had to cancel demonstrations related to agricultural practices (such as seed sowing techniques). The indicator on *percentage of cotton area harvested mechanically* had a target of 70% which was reduced to 3% in 2019 while the restructuring paper did not discuss the rationale for this at the time, the ICR pointed out that this was due to lack of uptake by farmers. The changes did not affect the PDO achievement and were responsive to the implementation realities.

### c. M&E Utilization

The project introduced innovative monitoring schemes including third-party monitoring to inform use of forced child labor complementing the related awareness campaigns. It also used a representative beneficiary feedback survey to demonstrate outcomes achieved in areas beyond the results framework, which further strengthened the evidence around the project's theory of change. The M&E framework also informed the project's citizen engagement and safeguards implementation by tracking grievances and their resolution.

The M&E framework tracked outputs but also outcome level results including energy consumption, quality of irrigation systems, O&M fee rates, as well as beneficiary feedback on crop diversification, income levels, and irrigation water availability.

The government restructurings and establishment of new ministries may pose challenges in retaining M&E capacity but since the PIU was involved in the previous water resource management project (DIWIP), it is likely that the project's M&E systems will benefit future Bank and non-Bank projects.

Overall, the M&E design and implementation was robust using relevant indicators at both output and outcome levels, introducing innovative tools, and triangulating multiple methods including third-party monitoring and beneficiary feedback surveys. However, monitoring of diversity and inclusion in WCAs



was insufficient. Adjustments to indicator targets (on cotton mechanization and demonstrations) were significant and late. The project assumed that WCA activities and results would automatically transfer to the new structure without tracking this transition in the results framework and data sources.

The M&E quality is rated Substantial with significant shortcomings.

## M&E Quality Rating

Substantial

## 10. Other Issues

### a. Safeguards

The project triggered six World Bank safeguard policies: Environmental Assessment (OP 4.01), Natural Habitats (OP 4.04), Pest Management (OP 4.09), Involuntary Resettlement (OP 4.12), Safety of Dams (OP 4.37), and Projects on International Waterways (OP 7.50).

**Environmental Assessment (OP/BP 4.01):** Since the project aimed to rehabilitate existing irrigated areas, rather than expanding irrigation to new areas, limited adverse impacts were envisaged at the time of appraisal. The project was therefore classified as Category B. Environmental assessments indicated that improving water management would positively impact the lower Amu Darya basin and the environment without affecting the water needs of riparian countries or the Aral Sea. Project sites were identified during preparation which allowed Environmental Social Management Plans to be prepared for the 16 sites. Although a grievance redress mechanism was established, the ICR did not report on the number of grievances received and resolved, number of households affected.

**Natural Habitats (OP 4.04):** The canal needed for water supply had been developed under DIWIP, and the project needed to ensure adequacy of its water resource to support associated biodiversity. At the time of completion, the project reported that there were no additional abstractions of water attributable to the project, thus noting that it would not undermine the current water allocation in the lower Amu Darya. The project also planted 400,000 trees to replace those that were cut during construction.

**Pest Management (OP 4.09):** The policy was triggered due to potential increases in pesticide use resulting from increased crop yield/agricultural productivity. There was a risk that this could cause pesticide residue build-up in the soil as well as in surface and ground water, which would disrupt agro-ecosystems and undermine sustainable agricultural production and pose human health risks. The project Environmental Social Management Plan included trainings targeted at WCAs and farmers.

**Involuntary Resettlement (OP 4.12):** The policy was triggered due to land acquisition and resettlement anticipated in rehabilitation works associated with Bustan Canal and secondary canals. The project activities were expected to affect over 400 ha of agricultural land, some access roads, residential and small commercial properties. At the time of project completion, the total number of affected people and households was not reported but the ICR noted a total of US\$2 million paid as compensation.

**Safety of Dams (OP 4.37):** The policy was triggered because the project area is downstream of the Tuyamuyun Dam. The project conducted a dam safety assessment and established an emergency





preparedness plan. Regular dam safety inspections and maintenance activities were carried out during implementation to ensure the structural integrity of the dam and the safety of downstream areas. Trainings on dam safety protocols were also conducted for relevant staff.

**Projects on International Waterways (OP 7.50):** The project triggered this policy because it operated on the Amu Darya, a transboundary water body, and because the drainage resulting from project area returned to the Aral Sea. The switch from river pumping to gravity diversion through the construction of the Bustan Canal and remodeling of secondary canals was expected to result in bulk-water savings, eliminating the need for water releases from the Tuyamuyun dam for pumping stations and preserving the flow and quality of the Amu Darya and irrigation withdrawals by other Aral Sea riparian countries. The ICR noted that the project activities did not undermine the current water allocation in the lower Amu Darya.

**Grievance Redress Mechanism:** A GRM was established in the early years of implementation. The 2019 restructuring added an indicator in the results framework to verify this. Specific measures were undertaken for proper functioning of the mechanism, including trainings and grievance recording procedures. The ICR noted that some labor safety violations (such as lack of proper personal protective equipment, insufficient training, and unsafe machinery handling) were registered by the PIU, but contractors generally implemented corrective measures.

## b. Fiduciary Compliance

**Procurement:** At the time of appraisal, procurement risks were considered high given the government's arduous contract registration processes, likelihood of political intervention, low competition levels due to high costs, and high perceived levels of corruption. The project prepared a procurement plan which included early preparation of tender documents, capacity building trainings for the PIU, and establishment of a complaint mechanism for bidders. Despite delays in the early years of implementation, the project managed to complete the contracts in line with the World Bank Procurement and Consultant Guidelines. The ICR did not discuss any incidence of divergence from standards or outstanding procurement issues at the time of completion.

**Financial Management:** Although FM risks were considered high during appraisal, the project reports did not record any major issues. FM ratings were mostly satisfactory throughout implementation. Interim Financial Report (IFR) submissions, the accounting system, and the flow of counterpart funds were considered satisfactory. External audits carried out by private firms were unqualified for all years.

## c. Unintended impacts (Positive or Negative)

None

## d. Other

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## 11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Satisfactory	Moderately Satisfactory	One of the two objectives is rated Modest for Efficacy. Overall Efficacy is rated Substantial, with significant shortcomings. Following OPCS and IEG guidelines, the outcome rating is Moderately Satisfactory.
Bank Performance	Satisfactory	Moderately Satisfactory	There were a few shortcomings in gathering baselines for a number of indicators, reporting updates on the results framework and safeguards aspects, and reflecting the institutional changes i.e., WCAs dissolved in the monitoring framework.
Quality of M&E	Substantial	Substantial	While rated substantial overall, the significant shortcomings are noted in the M&E section.
Quality of ICR	---	Substantial	

## 12. Lessons

The review has drawn three lessons from the project:

**Stakeholder engagement and consultations with beneficiaries can inform realistic intervention models.** The project faced challenges in introducing mechanized cotton harvesting due to low farmer acceptance. Recognizing cultural and institutional norms can be crucial in balancing ambitious targets with practical considerations. Thorough stakeholder engagement and realistic assessments of on-the-ground demand and capacity may enhance the effectiveness of future projects.

**When social inclusion measures in community development organizations are limited to participation quotas, an incomplete understanding of actual inclusion can result.** Although the project established a quota for women’s participation in farmer field schools and WCAs, it was unclear if this led to meaningful representation, voice, and decision-making role. When project interventions and monitoring benchmarks are limited to tracking participation alone, the deeper aspects of inclusion, such as agency, may be left unaddressed. This highlights the importance of evaluating not just the presence but the active engagement and influence of marginalized groups within these organizations.

**Beneficiary surveys can serve as a valuable tool for triangulating evidence and complementing the results framework.** Projects have a limited number of results indicators to



track both implementation progress and capture outcomes toward the achievement of the PDO. Supplementing these indicators with additional sources of information, such as national data, impact evaluations, and beneficiary surveys, can provide a more comprehensive understanding of project impacts. In this project, beneficiary surveys were conducted at two critical points, covering a large sample size, which provided valuable insights into outcomes such as income changes, crop diversification uptake, water availability, and other aspects of the theory of change. This approach enabled a deeper analysis of the project's effectiveness and helped to validate the reported results.

### 13. Assessment Recommended?

No

### 14. Comments on Quality of ICR

The ICR is comprehensive and well-written. It follows the Bank guidance and is concise. The reconstructed theory of change in Figure 1 provides a comprehensive picture of the activities and expected results.

The ICR uses, to the extent possible, evidence from the project's M&E framework, client reports, and beneficiary surveys to demonstrate results. This robust use of data enhances the credibility of the results presented.

However, the report discusses safeguards and fiduciary compliance during implementation at the level of an overview, and is lacking information on the outcome of the risk mitigation measures. While it mentions the total compensation provided to resettled households, it does not specify the number of affected households or the types of compensation they received. It the report notes that safeguards trainings were conducted for the client, contractors, and Water Consumer Associations (WCAs), but it does not clarify the frequency of these trainings. Also, it was indicated that a grievance redress mechanism was established but information was missing on the number of grievances received and resolved.

Consistency in information across the report is generally maintained, although there is a minor discrepancy regarding the original target for the percentage of cotton area harvested mechanically. The ICR inaccurately recorded the original target as 3% instead of the correct figure of 70%.

Overall, the ICR provides a solid foundation for assessing the project's achievements and areas for improvement. The quality of the ICR is rated Substantial.

#### a. Quality of ICR Rating

Substantial

