



1. Project Data

Project ID P164389	Project Name Water Security for the Valley of Mexico		
Country Mexico	Practice Area(Lead) Water		
L/C/TF Number(s) IBRD-90490	Closing Date (Original) 31-Dec-2025	Total Project Cost (USD) 18,640,895.33	
Bank Approval Date 27-Feb-2020	Closing Date (Actual) 31-Dec-2024		
	IBRD/IDA (USD)	Grants (USD)	
Original Commitment	120,000,000.00	0.00	
Revised Commitment	18,640,895.33	0.00	
Actual	18,640,895.33	0.00	
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2. Project Objectives and Components

a. Objectives

The Project Development Objectives in the PAD (p.14) are: "**(i) to improve the reliability of the Cutzamala System and (ii) to strengthen the management of groundwater resources in the Valley of Mexico**". The Financing Agreement for the loan (p. 5) has the same objectives. This review has assessed the PDO achievement in terms of the following two objectives:

1. To improve the reliability of the Cutzamala System;



2. To strengthen the management of groundwater resources in the Valley of Mexico.

Two restructurings resulted in a decreased scope of the project, as well as a reduction in targets and indicators. As a result, a split evaluation was conducted in the ICRR.

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

Yes

Did the Board approve the revised objectives/key associated outcome targets?

No

c. Will a split evaluation be undertaken?

Yes

d. Components

Component 1: Improving energy efficiency and resilience of the Cutzamala System (US\$60 million at appraisal, and US\$18.64 million actual). Activities that were planned to be financed under this component included two subgroups of activities. The first subgroup included: (i) the rehabilitation of the data collection existing network, (ii) the acquisition and installation of a hydrometeorological and climate network, a water quality monitoring network, a groundwater monitoring network, a network to monitor reservoir and canal levels to measure water distribution and use, (iii) the acquisition and installation of monitoring equipment for the Cutzamala System Dams; (iv) the revision and updating of the existing supervision control and data acquisition system (SCADA) of the Cutzamala System; and (v) the design and implementation of a decision support system to carry out water balances, water allocation, and support the operation of the Cutzamala System. This component also financed a second sub-group of infrastructure activities and plans that included: (i) engineering analysis and design for a reversible pressurized transmission line to convey water to the Villa Victoria reservoir, (ii) the rehabilitation works of the Cutzamala System Dams, (iii) development of operation and maintenance plans, and emergency preparedness plans for the Cutzamala System Dams; (iv) civil works and the acquisition and installation of electrical and mechanical equipment for the rehabilitation of the Cutzamala System Dams; and (v) installation of electrical and mechanical equipment. After the restructurings, the first subgroup of activities was dropped. Most of the activities under the second group were also dropped, except the following: (i) installation of electrical and mechanical equipment, (ii) minor works at dams, pumping stations, and water treatment plants, and some maintenance activities that were added, such as desilting canals, replacement and reinforcement of pipelines, and dredging reservoirs.

Component 2: Groundwater management and recharge pilot infrastructure in the Valley of Mexico (US\$54 million at appraisal, US\$0 million actual). Activities that were planned to be financed under this component included two subgroups of activities. The first sub-group (subcomponent 2.1) included: (i) the collection of baseline data and a diagnostic on water quality and quantity of aquifers; (ii) inventory of wells within the Valley of Mexico, (iii) the expansion and automation of the piezometric network of the Valley of Mexico; and (iv) improvement of the aquifer modeling tool to produce water balances and the dissemination of information. No IBRD financing was used for this group of activities as originally envisioned, and only US\$0.2 million in counterpart funding financed some activities that allowed for the calculation of a water balance for the Valley of Mexico.



The second group of activities (subcomponent 2.2) that were planned included: (i) engineering analysis and designs; (ii) civil works and the acquisition and installation of electrical and mechanical equipment for the upgrading of existing wastewater treatment plants; (iii) the construction of aquifer recharge wells; and (iv) the construction of conveyance infrastructure from the wastewater treatment plants (WWTPs) to the recharge wells. The second group of activities was dropped at the first restructuring.

Component 3: Institutional strengthening and project management (US\$5.7 million at appraisal, and US\$0 actual). Activities that were intended to be financed under this component included: (i) training on infrastructure operation, groundwater management, citizen engagement, outreach and dissemination, leadership, technical and gender awareness training for National Water Commission staff (CONAGUA for its Spanish acronym - Comisión Nacional del Agua). The second restructuring reduced the loan proceeds to zero, but the component was retained due to the allocation of government resources and technical assistance provided by the Task Team. (Second restructuring paper, p.2)

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

Cost: The estimated total project cost at appraisal was US\$120 million. The actual total cost was US\$18.64 million (ICR, p. ii).

Financing: At appraisal, the IBRD financing was estimated at US\$120 million, and during implementation, US\$90 million was cancelled from the loan. The amount disbursed at closing was US\$18.64 million of the loan, which was 15.5 percent of the original loan amount and 60 percent of the revised loan. (ICR, p. 5). The remaining loan amount was canceled (WB operations workspace database).

Borrower Contribution: The Borrower committed to US\$0 million in counterpart financing at appraisal, which did not change during implementation.

Dates: The Project was approved on Feb 27, 2020, and became effective on June 1, 2022, almost two years later than the planned effectiveness date. The project closing date at appraisal was set to December 31, 2025, but the actual closing date was shorted by one year December 31, 2024, for a total implementation period of four years and ten months. The Mid-Term Review (MTR) was conducted in November 2023. The project had two restructurings that included the following:

- On May 25, 2022, a level 2 restructuring revised project components and costs, dropped activities from Component 2, updated the results framework targets and dropped indicators, revised disbursement estimates and implementation schedule; adjusted implementation arrangements of the financial agent, and updated the technical analysis to incorporate aspects related to the revised components.

On September 30, 2024, a second level 2 restructuring cancelled US\$90 million of the loan, reduced the implementation period by one year with an end date of December 31, 2024, changed the allocation of funds between components, reduced the scope of activities across components, but retained minor civil works related to electromechanical, O&M and energy efficiency improvements to the Cutzamala System, adjusted the PDO indicator target and baseline value, and added one new intermediate indicator on infrastructure maintenance actions in the Cutzamala System added to Component 1.



3. Relevance of Objectives

Rationale

Mexico is an upper-middle-income country of around 124 million people (2024). The official multidimensional poverty rate was 43.2 percent of the population in 2016, which fell to 36.3 percent in 2022 (World Bank). As the country's population has grown, its availability to water sources per capita has fallen dramatically from 18,035 cubic meters per year in 1950 to 3,392 cubic meters per year in 2015, with estimation of 3,250 cubic meters per year by 2030. The decreasing availability of freshwater resources has put a strain on groundwater resources, which is the source of 65 percent of all water used by Mexican cities. Over pumping of groundwater has led to subsidence of 43 centimeters per year in Mexico City, causing structural damage to urban infrastructure. (PAD, p. 8) With rising temperatures and more erratic rainfall events due to climate change, the PDO is appropriately aligned with the development challenge for the country context.

The PDO was aligned with the Country Partnership Framework's (CPF) FY20-25 focus area "*Enabling Sustainable Infrastructure and Climate Action*", and its Objective 6- "*Provide more inclusive and sustainable infrastructure services*". The project indirectly contributed to Objective 6's core indicator of the number of people in selected urban areas with improved water supply reliability or water service quality supported by World Bank financed projects. This indicator had a target of 5.9 million people. It is considered indirectly supported as the project did not have any person-level indicators but suggested that 23.4 million people in the Valley of Mexico Metropolitan Area (VMMA) and the Toluca Metropolitan Area (TMA) would benefit from improved water security. (PAD, p. 14). Likewise, Objective 6 also had a core indicator of lifetime energy savings due to energy efficiency projects in public facilities that the project would have contributed to indirectly, as the project did not have any indicators tracking energy efficiency despite having energy efficiency activities. While the project is broadly aligned with CPF's Objective 7 to support the government in reaching its climate change goals, there are no CPF Objective 7 core nor supplemental indicators that are tied to the project.

The project's PDOs are relevant to the government's 2024-2030 National Water Plan, which aims to guarantee the human right to a sufficient quality and quantity of water, ensure the sustainable use of water resources, and encourage adequate and responsible water management for all uses. (ICR, p. 6). While the project was relevant to the government's broader national water plan, the government shifted its priorities over the course of the project and dramatically narrowed its focus.

The PDO was at an appropriate level for the country context and the development challenge, relevant to CPF. The project was designed taking into account the government's experience with aquifer charge in other states in Mexico as well as the World Bank's regional and global experience with water resource management and dam rehabilitation. At design the project also accounted for CONAGUA's budgeting process that had delayed prior water sector investment projects. (PAD, p. 17). The PDO was also relevant to the government's national water plan, but the project was scaled back significantly with a narrower focus than what was originally conceived due to shifting priorities of the government, albeit with no revision to the PDO; therefore, the relevance rating is considered **Substantial** at closing.

Rating



Substantial

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

To improve the reliability of the Cutzamala System

Rationale

The theory of change (ToC) in the PAD (42-45) and the Implementation Completion Report (ICR, p. 3) identified the outcome to be the improved reliability of the Cutzamala System. The expected outputs were: (i) rehabilitation of data collection networks, (ii) updated SCADA system installed for the Cutzamala System; (iii) decision tree support system developed; (iv) rehabilitation of works for transmission lines, dams, pumping stations, and water treatment plants; (v) electrical and mechanical equipment updated, and O&M and emergency preparedness plans developed. These outputs were expected to lead to outcomes such as improved decision making, energy efficiency, and operation of the Cutzamala System (dams, bulk water transmission lines, and water treatment plants). These outcomes, in turn, were expected to lead to the PDO of improved reliability of the Cutzamala System, contributing to higher-level outcomes of improved water security and enhanced resilience to climate change in the project sites.

The ToC's activities, outputs, and outcomes were detailed and adequate to make the linkage with the PDO 1 outcome target, however the project lacked an institutional capacity objective, despite having explicit activities to strengthen capacity.

The assumptions in general were relevant. The PAD (p. 42) and the ICR (p. 4) identified critical assumptions to be: strong government commitment and adequate CONAGUA resourcing, stable Cutzamala transfer volumes, efforts to reduce Valley of Mexico aquifer over-extraction, and sufficient technical capacity to manage monitoring/analysis, operate SCADA, and implement energy efficiency and dam safety investments. These assumptions were specific and relevant to the project context and PDO 1. .

OUTPUTS

- No SCADA system in place and using data from the monitoring network, **not achieving** the original target of establishing a SCADA.
- 0 dam operation and maintenance and emergency plans prepared and adopted by CONAGUA, **not achieving** the original target of 8. (ICR. p.10)
- 0 dams rehabilitated under the Project, not achieving the original target of 4. (ICR. p.10)
- No engineering analysis and design of the pressurized transmission line completed, **not achieving** the original target. (ICR, p. 10)
- No improved dam safety in key Cutzamala dams, not achieving the original target. (ICR, p.10) This indicator aimed to capture the number of dams rehabilitated following international dam safety standards, but no dams were rehabilitated, and therefore, this indicator was not achieved.



- Grievances resolved related to the delivery of project benefits addressed had an original target of 95 percent. This indicator is better suited for an institutional strengthening objective, which does not exist for the project; therefore, it is included here since this PDO had works completed. The ICR states that while the grievance redress mechanism (GRM) through the project helped strengthen national systems, there was no evidence that any grievances related to project activities were received. (ICR, p. 26).

While the project did not carry out the planned activities as detailed in the PAD and resulted in non-achievement of the output indicators above, the ICR documented that the project did finance a series of maintenance activities that included: desilting and maintenance of canals/treatment plants; upgrades to treatment plants and pumping stations; dam gate and debris maintenance; energy-efficient lighting installation; access road improvements for O&M; pipeline rehabilitation; and reservoir dredging. (ICR, p.9) While these activities were expected to contribute to the reliability of the Cutzamala System (ICR, p. 8), they were a significant departure in scope from the planned activities at appraisal that were envisioned to reach the PDO outcome.

Outcome:

- 95 percent improved reliability of the Cutzamala System for the delivery of water to the VMMA and the TMA, **achieving** the original target of 90 percent. The PAD defined reliability as the percentage of days in which the system successfully supplies the target delivery to Mexico City. The baseline for reliability of the Cutzamala System was estimated at 82 percent.

The ICR (p. 8) notes that the PDO indicator was not a robust measure of project efficacy because overall Cutzamala System reliability is affected by many non-project factors (e.g., rainfall variability, unrelated maintenance, component failures, and other investments). The ICR states that such non-project related factors likely had a larger role in influencing the overall reliability than the maintenance activities financed by the project, especially considering that many of the project activities didn't take place until the second half of 2024. In addition, the ICR's interviews with government staff suggest reliability improvements were mainly driven by a government-financed discharge manifold that enabled maintenance without full system shutdown. (ICR, p. 8)

While not a formal indicator in the results framework at appraisal nor during implementation, the ICR reported the following:

- 5,000,000 people with enhanced resilience to climate risks, and of these, 1,200,000 are 15-24 years of age. An estimated 2,585,000 women benefited. The ICR estimated that the Cutzamala System provides water to approximately 24 percent of the Valley of Mexico population of 21 million people.

The achievement of the original PDO 1 is rated as Negligible. As highlighted by the ICR, the PDO outcome indicator was not a good metric to measure the effects of the project on the Cutzamala System. The project did not carry out the planned activities and did not achieve the output indicator targets. While the PDO indicator target was achieved, this was likely due to factors other than project interventions; as a result, the rating for PDO 1 is rated **Negligible**.

Rating



Negligible

OBJECTIVE 1 REVISION 1

Revised Objective

To improve the reliability of the Cutzamala System

Revised Rationale

The ToC for PDO 1 in the ICR remained the same, as the main change to the project was the cancellation of a subcomponent related to PDO 2 and the management of groundwater resources. The funds from that subcomponent were reallocated to scale up activities related to energy efficiency and reliability of the Cutzamala System for PDO 1. Additionally, over US\$14 million was reallocated from activities related to modernizing information systems under PDO 1 to activities focused on enhancing energy efficiency and resilience of the Cutzamala System; however, the restructuring paper did not describe what information system activities related to PDO 1 would be dropped, if any. A shortcoming of the restructuring was that, despite the reallocation of over US\$64 million to energy efficiency and resilience activities, the results framework indicators and targets were not updated or revised, nor were new indicators added to reflect the expanded scope.

The revised PDO1 rating remained Negligible. The ToC's activities, outputs, and outcomes remained the same and were adequate to make the linkage with the PDO 1 outcome target. The shortcoming in measuring the PDO outcome remained the same, and additional weaknesses in the results framework were introduced at the restructuring by not capturing the expanded scope of additional activities related to PDO 1. The project did not carry out the planned activities and did not achieve the output indicator targets. While the PDO indicator target was achieved (i.e. 95 percent improved reliability of the Cutzamala System for the delivery of water to the VMMA and the TMA, against the target of 90 percent), this was likely due to factors other than project interventions; as a result, the rating for PDO 1 remained as **Negligible**.

Revised Rating

Negligible

OBJECTIVE 1 REVISION 2

Revised Objective

To improve the reliability of the Cutzamala System

Revised Rationale

The second restructuring cancelled US\$90 million from the loan, significantly reduced the scope of activities, modified the ToC, and the results framework for PDO 1. All activities related to the original output indicators were dropped along with their respective indicators. A new indicator was added to focus on priority maintenance activities identified by the government. While the reduction in scope of activities was a response to the government's request, and the new maintenance activities that were added were supportive of PDO 1, the changes were a significant departure from the original ToC and calls into question the value addition of the Bank's financing. The financed activities were more standard operation and maintenance activities and were not as consequential to the PDO 1 outcomes as compared to the original activities.



OUTPUTS

- 15 infrastructure maintenance actions implemented in the Cutzamala System, **exceeding** the revised target of 8. This was a new indicator added at the second restructuring. The types of activities conducted included: (i) maintenance and desilting of canals and treatment plants, (ii) installation of water treatment plants and replacement of electrical equipment at pumping stations, (iii) maintenance of dam gates, debris management, and leak repair, (iv) improvements to electrical systems at dams and pumping stations, (v) installation of energy efficient lighting, (vi) improvements of access roads or operation and maintenance, (vii) rehabilitation of pipelines, and (viii) and dredging of reservoirs. (ICR, p.9 and 35) The ICR states that these activities were expected to contribute to the reliability of the Cutzamala System, and the government considered these interventions critical to improve the operation, safety, and reliability of the Cutzamala System (ICR, p. 8 and 35).
- Grievances resolved related to the delivery of project benefits addressed had an original target of 95 percent. This indicator is better suited for an institutional strengthening objective, which does not exist for the project; therefore, it is included here since this PDO had works completed. The ICR states that while the grievance redress mechanism (GRM) through the project helped strengthen national systems, there was no evidence that a grievance related to project activities was received. (ICR, p. 26).

OUTCOME:

- 95 percent improved reliability of the Cutzamala System for the delivery of water to the VMMA and the TMA. The revised target of 95 percent remains **achieved**. The ICR reported that the baseline was updated from 82 percent to 90 percent at the second restructuring, as the target of 90 percent had been achieved during implementation. The caveats around the project's attribution to achieve the PDO outcome remain the same as documented in the ICR.

The achievement of the revised PDO 1 is rated as Modest. The ToC's activities and outputs were significantly reduced, yet the outcome indicator remained the same, and the target was increased. However, the implemented activities were also necessary for ongoing operation and maintenance of the Cutzamala System, which contributed to the reliable operation of the system. Thus given the contributions of the financed and executed activities, the rating for PDO is upgraded to **Modest**.

Revised Rating

Modest

OBJECTIVE 2

Objective

To strengthen the management of groundwater resources in the Valley of Mexico

Rationale

The ToC's activities, outputs, and outcomes were detailed and generally adequate to make the linkage with the PDO 2 outcome target. The ToC in the PAD (42-45) and the ICR (p. 3) identified the outcome to be strengthened management of groundwater resources in the Valley of Mexico. The expected outputs were: (i)



baseline data on aquifers and inventory of wells completed; (ii) expansion of piezometric network completed leading to improved availability and timeliness of groundwater management information; (iii) aquifer modeling tool improved; (iv) engineering designs for civil works and electromechanical works completed and installed; (v) aquifer recharge wells constructed and conveyance systems from WWTPs to recharge wells completed; and (vi) capacity building on groundwater management completed. These outputs were expected to lead to outcomes such as improved decision-making on groundwater, enhanced monitoring and management of VMMA aquifers, and aquifer recharge pilots contributing to the sustainability of the VMMA aquifer. These outcomes, in turn, are expected to lead to the PDO of improved management of groundwater resources in the Valley of Mexico, contributing to higher-level outcomes of improved water security and enhanced resilience to climate change in the project sites. The critical assumptions identified under PDO 1 are equally relevant for PDO 1, given that the PDOs are interconnected.

OUTPUTS

- Engineering analysis and designs were not completed for advanced wastewater treatment facilities, **not achieving** the original target of being completed. This indicator was dropped at the first restructuring.
- 0 advanced wastewater treatment facilities constructed to meet effluent standards for aquifer recharge, **not achieving** the original target of 1. This indicator was dropped at the first restructuring.
- The water balance for the Valley of Mexico was updated, **achieving** the original target of Yes; however, this was done with government resources. The ICR (p.26) notes that the government staff reported that the aquifer water balance is updated every year as required by law and published in the National Hydraulic Plan. This annual update has been done for the last 20 years.
- The aquifer model was not improved to include monthly variability, **not achieving** the original target of improved. The ICR stated that the government staff reported that the aquifer model has not been developed because they were not able to secure national resources to fund its development. The project did not provide any funding for improving the aquifer model. (ICR, p. 26)
- 240 female CONAGUA employees have completed training, **not achieving** the original target of 300; in addition, an additional 27 CONAGUA employees were trained as trainers. While the trainings conceivably contributed to a better workplace environment and empowerment of women in the workplace, it is unclear how these trainings link directly to the PDO 2 of strengthened management of groundwater resources.
- 92 percent of women expressed satisfaction with the technical and leadership training, exceeding the original target of 80 percent. (ICR, p. 27). Similar to the indicator above, this indicator is vague and is not clearly linked to PDO 2.

OUTCOME:

- Annual reporting on groundwater information on quantity and quality is being used for decision making, **achieving** the original target. (ICR, p. 23) The ICR noted that the information on groundwater quality and quantity informs decision-making on allocating water concessions that require groundwater pumping. However, the ICR also noted that it was done without project funds and cannot be attributable to the project.



The project did not carry out the planned activities and did not achieve the output indicator targets with project resources. While the PDO indicator target was achieved, this was not due to the project; as a result, the rating for PDO 2 is **Negligible**.

Rating
Negligible

OBJECTIVE 2 REVISION 1

Revised Objective

To strengthen the management of groundwater resources in the Valley of Mexico

Revised Rationale

The first restructuring reallocated US\$52 million from component 2 to component 1, leaving only US\$2 million to implement activities related to designing and implementing an aquifer observatory for the Valley of Mexico. All activities related to infrastructure works for aquifer recharge activities (subcomponent 2.2 ~US\$50.6 million) were cancelled. The restructuring paper did not describe which activities from subcomponent 2.1 would be reduced as a result of the US\$1.4 million that was reallocated to component 1. The project did not carry out the planned activities and did not achieve the output indicator targets with project resources. While the PDO indicator target was achieved, this was not due to the project; as a result, the rating for PDO 2 is **Negligible**.

Revised Rating
Negligible

OVERALL EFFICACY

Rationale

PDO 1 had indicators that were able to generally measure the ToC at the output and outcome level with moderate shortcomings. No progress was made against any of the output indicators that would have directly led to the outcome target. The outcome target was achieved, but the ICR noted that it was likely to be due to other factors outside of the project's influence, resulting in a Negligible rating for PDO 1. Three of the four technical output indicators for PDO 2 were not achieved, and for the one that was achieved, the ICR noted that it was done with the government's own resources. The two training indicators were achieved, but the linkage to the PDO 2 outcome was not clear. The PDO 2 outcome target was achieved, but the ICR noted that it was due to government-financed activities; it was not attributable to the Bank's financed activities. As a result, the overall efficacy is rated Negligible.

Overall Efficacy Rating

Primary Reason



Negligible

Low achievement

OVERALL EFFICACY REVISION 1

Overall Efficacy Revision 1 Rationale

The rating for PDO 1 remains Negligible because the financing related to this PDO was significantly increased to expand the scope, but none of the output indicator targets were achieved. As noted above, the PDO 1 outcome target was achieved but due to government financing. The PDO 2 rating remains Negligible as the targets for the remaining two output indicators and outcome indicators were not achieved as a result of project financing. The indicators on training remained the same and were not directly linked to PDO 2. As a result, the overall efficacy remains Negligible.

Overall Efficacy Revision 1 Rating

Negligible

Primary Reason

Low achievement

OVERALL EFFICACY REVISION 2

Overall Efficacy Revision 2 Rationale

The rating PDO 1 was upgraded to Modest despite a significant reduction in the scope of the activities. The second restructuring focused on a set of priority interventions identified by the government that are aligned with the PDO 1 and measured in the results framework. It is plausible that the priority interventions will likely contribute to the government maintaining the achievement of the target for PDO 1. The rating for PDO 2 remains Negligible as no further progress was achieved as result of the project activities. All remaining project-financed activities related to PDO 2 were cancelled at the second restructuring. As a result, the overall efficacy is upgraded to Modest.

Overall Efficacy Revision 2 Rating

Modest

Primary Reason

Low achievement

5. Efficiency

Ex Ante Economic Efficiency: The project did not conduct any economic or financial analysis, such as estimations of economic or financial internal rate of return at appraisal. The PAD, (p. 56) articulated the different types of benefits that would accrue from the project such as energy efficiency, improved reliability of water services for utilities, improved dam safety and reduced risk of failure. The PAD stated that it was too difficult to estimate the economic benefits due to methodological issues and instead opted to do a cost-effectiveness analysis using the Decision Tree Framework to identify the interventions that would have the most impact.

Ex Post Economic Efficiency: There was no economic analysis at project completion. The ICR (p. 11) stated that a traditional quantitative ex-post economic analysis was no longer applicable or feasible, and the economic analysis at completion focused on assessing efficiency through a qualitative lens. Despite the significant reduction in component 1 activities and the elimination of component 2 activities, the ICR documented a modeling exercise to estimate the influence of the maintenance activities that were financed through the project. This modeling conducted different scenarios that included and excluded the maintenance activities that were executed by the project and assessed the reliability of individual components of the Cutzamala System. The



modeling showed that if maintenance interventions had not been implemented, the system would have faced reliability losses of up to 6 percent in dry years. (ICR, p. 39) Given the inability to carry out of economic analysis, the ICR provided a second-best analysis that provided some evidence regarding the influence of the project financed activities on the reliability of individual components of the Cutzamala System.

Operational and Administrative Efficiency: The ICR highlighted major administrative and financial management shortcomings, including a two-year delay in effectiveness due to a change in government and the following scrutiny of international financial institution (IFI)-financed projects, compounded by high staff turnover. Implementation further slowed because the project applied World Bank procurement systems (no use of national systems), forcing staff to manage parallel systems amid institutional instability. Ministry of Finance budget rules limited annual allocations and imposed budgeting requirements and rules for external funds, making it difficult to execute procurement. This led to delays then eventual cancelation of substantial project funds as well as one year earlier than planned closing of the project. The reasons why the World Bank did not extend the project after its effectiveness, given the two-year delay in signing, are unclear.

Conclusion. The project did not conduct any analysis at appraisal nor at closing to estimate economic rates of return of the project investments. At appraisal, the project used the Decision Tree Framework to identify system vulnerabilities and then conducted a cost-effectiveness analysis on different interventions to address those vulnerabilities, taking into account different performance scenarios. (PAD, p. 55) The PAD states that the economic term used for the cost calculations was 30 years, with a discount rate of 10 percent and capital costs spread over the first 5 years of the investment. Since the project did not make the anticipated investments, there was no comparator analysis at project close. However, the ICR did analyze and model the effects of the maintenance interventions financed by the project, which was able to demonstrate avoided losses of reliability of the water system. While these results were not measured in economic or financial terms, they provide an evidence base for the efficiency of the interventions to generate benefits on system reliability. This was balanced by significant administrative and operational inefficiencies. Given the overall reduction in costs of the project, and the ability to still generate some benefits, the rating for efficiency is considered Modest.

Efficiency Rating

Modest

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 (%)
Appraisal		0	0 <input type="checkbox"/> Not Applicable
ICR Estimate		0	0 <input type="checkbox"/> Not Applicable

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

6. Outcome



The project’s relevance was rated as Substantial, the original Efficacy was Negligible, the Revised Efficacy remained Negligible and was upgraded to Modest after the second restructuring. The Efficiency was rated Modest. With the split rating (outlined in the table below), the overall Outcome rating is Unsatisfactory.

	Original Objectives	Objectives after May 2022 Revision 1	Objectives after September 2024 Revision 2
Relevance	Substantial	Substantial	Substantial
PDO 1 - To increase access to sanitation services in the project cities.	Negligible	Negligible	Modest
PDO 2 – To improve the operational performance of sanitation utilities in the project cities.	Negligible	Negligible	
Efficacy	Negligible	Negligible	Modest
Efficiency	Modest		
Outcome	Unsatisfactory	Unsatisfactory	Moderately Unsatisfactory
Numerical value of outcome rating	2	2	3
Amount disbursed (out of US\$18.64 million total disbursed IBRD)	US\$0	US\$10.13*	US\$8.52
Share of disbursements	0%	54%	46%
Weighted value of outcome ratings	0	1.08	1.38
Final Outcome rating	2.46 is rounded down to Unsatisfactory		

*The ICRR used the amounts disbursed as listed in the restructuring papers which differ slightly from the ICR

a. Outcome Rating
Unsatisfactory

7. Risk to Development Outcome

The risks to the development outcomes are primarily linked to:

Financial risk: this risk relates to Organismo de Cuenca Aguas del Valle de México’s (OCAVM) ability to generate adequate resources through its bulk water fees or federal subsidies to continue financing operations and maintenance interventions and minor upgrades. An economic downturn or shock that requires the federal government to limit spending could negatively affect OCAVM’s ability to operate and maintain new equipment installed under the project properly. Likewise, the project’s financing of what would be considered routine O&M activities, such as dredging, canal and water treatment cleaning, suggests that OCAVM may not be able to cover routine O&M costs.

Technical risk: at project design, a detailed analysis identified structural vulnerabilities in the Cutzamala System and selected high-priority investments to address those vulnerabilities, which were ultimately not



implemented. While the project financed more routine maintenance activities and minor upgrades to equipment and infrastructure that supported the reliability of the system, they did not address the medium to long-term needs identified in 2016-2017 during preparation almost a decade ago. The technical risk is that those vulnerabilities still need to be addressed to ensure the system's reliability. If they are not, then the benefits generated from the investments in minor works and upgrades made under the project may not be sustained.

Ownership and commitment risk: this risk pertains to OCAVM and CONAGUA's commitment to sustaining the investments made by the project. The Cutzamala System for water supply to the VMMA is critical infrastructure for the economy of the Valley of Mexico and Mexico City, the country's largest urban population. The borrower's comments in the ICR suggest that the investments in electromechanical activities under the project were critical not only for improved operation of the systems, but also for them to move forward with a SCADA system to make operations more efficient. The borrower's comments in the ICR indicated that the SCADA system is currently in the bidding process using government funds, signaling the commitment to leverage the project investments.

8. Assessment of Bank Performance

a. Quality-at-Entry

The World Bank task team adequately assessed the project's technical, environmental, and social aspects and engaged a wide range of government and non-government stakeholders. Given that the Valley of Mexico faced among the highest water-stress levels in the country and accounted for 38 percent of Mexico's GDP, the project was well aligned with the development challenge. The technical design was informed by state-of-the-art modeling that incorporated resilience and climate considerations and guided the selection of cost-effective interventions. The project also took a holistic approach to water resources management, addressing both surface water and groundwater issues that are critical to the Valley of Mexico, particularly the metropolitan area.

The key weakness at entry was not acknowledging and mitigating the administrative and implementation risks. The PAD stated that CONAGUA had a long history of implementing World Bank projects and assessed financial management and procurement risks as moderate (PAD, pp. 21–22). Although the change in federal administration in 2018 may have contributed to staff turnover after preparation and before Board approval, the PAD did not update the financial management and procurement risk ratings. The PAD did not adequately acknowledge implementation issues documented in the ICRs of predecessor projects, such as P121195 (2010–2016). That ICR highlighted recurring budgetary constraints, including difficulties in formulating multi-year budgets for large investments, and emphasized the need to prioritize investments that could be executed within a single fiscal year. Unlike this project, earlier operations such as P121195 were extended, giving CONAGUA and implementing entities additional time to complete activities. Given that these constraints were well known, it was a significant oversight by the Task Team and the Country Management Unit (CMU) not to flag them at preparation and incorporate mitigation measures into the project design with CONAGUA and the Ministry of Finance.

The project's duration was too short. With the change in administration, it took two years between Board approval and effectiveness, where implementing agencies did not have access to loan proceeds, limiting their ability to finance interventions. This effectively reduced the implementation period from 5 years and



10 months to 3 years and 10 months. The project closing date was not extended before signing the loan agreement, and the shortened implementation period was not a realistic timeframe to implement the envisioned activities. (ICR Task Team Interview, December 17, 2025)

The theory of change was detailed, and the results framework was generally adequate, with moderate shortcomings in measuring the PDO outcome. The PDO could have more explicitly included an institutional-strengthening objective to better align activities with intended outcomes. Overall, despite the Bank's prior knowledge of relevant budgetary and procurement risks in the water sector, these were not sufficiently addressed at entry, and the project experienced similar implementation constraints as prior project with CONAGUA. This is considered a major shortcoming and therefore, the Quality at Entry rating is **Moderately Unsatisfactory**.

Quality-at-Entry Rating Moderately Unsatisfactory

b. Quality of supervision

The World Bank minimized staff turnover, and the project benefited from having two different Task Team Leaders located in the country over the course of the project, allowing them to meet frequently with government counterparts. There were ten recorded supervision missions, which averaged more than two per year between 2020 and 2024. ISRs that were filed were comprehensive and candid. The ISRs noted that the Task Team was having bi-weekly meetings with their counterparts at different points to advance project activities. The ICR reported that despite candidness on progress, the Task Team remained overly optimistic that the restructurings would lead to improvements in implementation progress. (ICR, p. 19) The ICR reported that the decision to cut funding for Component 2 yet maintain its associated PDO and indicator, detrimentally impacted the project's efficacy rating, noting that the intention was to recognize progress made by the counterpart and other partners in improving groundwater management outside the scope of the project. The Task Team was responsive to the government and supported the restructuring to narrow project activities to interventions that focused on short-term improvements and government priorities. The ICR was not explicit about the role that the CMU played, and how/whether the Task Team used the CMU to elevate the budgetary issues to higher authorities within the Ministry of Finance to help resolve the challenges faced by the project.

The World Bank Task Team proactively mobilized different trust fund resources when it became apparent that different activities would not be financed by the loan. Key technical assistance that was provided was a dam safety specialist who informed decisions about the types of maintenance activities that should be done and were financed by the project. The ICR noted that the Task Team provided technical assistance through a groundwater management specialist, but the impacts of the TA were not visible. Additionally, the Task Team provided training for female government staff on leadership and other topics, which were reportedly highly valued by staff; however, this capacity building was not explicitly aligned with the PDOs. The Task Team's efforts were proactive but were not effective in changing the outcome of the project. The Quality of Supervision is considered Moderately Unsatisfactory.

The project had strategic relevance for the country and was technically sound; however the major shortcoming at entry was that the Task Team and CMU did not recognize the budgetary and procurement as substantial or high risks and offer mitigating measures when they had knowledge of these from prior



projects with the same implementing entity, CONAGUA. While the Task Team took proactive steps during implementation to restructure the project, and provide technical assistance, these efforts did not significantly change the course of the project implementation; therefore, the Bank Performance is considered **Moderately Unsatisfactory**.

Quality of Supervision Rating

Moderately Unsatisfactory

Overall Bank Performance Rating

Moderately Unsatisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

The ToC for the project was detailed and clear for the two PDOs. A shortcoming was that there was a disconnect with the capacity-building activities, and there could have been a third objective that focused on institutional strengthening. The indicators in the results framework related to PDO 1 were generally adequate but missed the energy efficiency aspect of component 1. The PDO 1 outcome indicator was, as noted in the ICR (p.17), difficult to attribute to the project interventions due to a variety of factors outside the control of the project. Indicators for PDO 2 could have included items related to expanded information networks or wells constructed to make a better link with the inputs, intermediate outcomes, and outcomes. The indicators for institutional strengthening were vague and not clearly linked to a PDO. (ICR, p. 16)

b. M&E Implementation

The ICR reported that progress on indicator targets was regularly reviewed during implementation and the ISRs show that updates were made where relevant. The inability to demonstrate sufficient progress against the indicators was used to inform the restructurings. The ICR noted that the M&E reports provided by the implementing agency did not include information as to how the indicators were calculated and where the data was drawn from. (ICR, p. 17)

The original PDOs were maintained despite three quarters of the loan being cancelled and all activities related to PDO 2 being eliminated. The ICR notes that this was done to recognize activities that were implemented but not financed by the project. (ICR, p. 17) However, retaining PDO 2 despite not having activities financed by the project, coupled with the significant overall reduction of activities envisioned at appraisal, created a disconnect in the ToC and results framework.

c. M&E Utilization

The ICR reported that the information generated from the M&E was used to justify the restructuring. The ICR also notes that the project's ToC nor assumptions were updated, missing an opportunity to reframe the project's expected outputs and outcomes, and their relationship with the PDOs. (ICR, p. 17) It is not



clear from the ICR if the lack of progress was communicated to the larger group of interested stakeholders that were engaged at project design.

The project M&E system was generally adequate to measure the ToC with moderate shortcomings at design. During implementation, the project missed opportunities to align the PDO, indicators, and activities resulting in a **Modest** rating.

M&E Quality Rating

Modest

10. Other Issues

a. Safeguards

Environmental: The project was classified as a Category B project. Given the nature and scale of its activities, it triggered the following Environmental Safeguard Policies: Environmental Assessment (OP 4.01), Natural Habitats (OP 4.04), and Safety of Dams (OP 4.37). The environmental risk was rated as Substantial at design largely due to the work related to dams. The ICR (p. 18) reported that, given the significant reduction in scope of the project, compliance with these safeguard policies was straightforward and no issues arose during implementation. The project planned to create an independent panel of experts to review risk-based dam safety assessments, safety inspection reports, O&M and emergency plans, etc.; however, the panel was not formed due to the reduction in scope. The project published an Environmental and Social Management Framework in 2017, and was updated in 2022, and again after the two restructurings. The last ISR reports an overall safeguards rating of moderately satisfactory.

Social: The project triggered the following social safeguard policies: Physical and Cultural Resources (OP 4.11), Indigenous Peoples (OP 4.10), and Involuntary Settlement (OP 4.12). A resettlement framework was developed during preparation but was not implemented due to the reduced scope of activities. The last ISR on record states that, given the reduced scope of activities, which are restricted to maintenance and minor rehabilitation works, any negative environmental and social impacts were considered moderate to low and could be addressed with standard mitigation measures and environmental health and safety good practices. The ICR (p.18) reported that OCAVM submitted final reports on environmental and social mitigation measures taken, which demonstrated that the project complied with all applicable safeguard policies.

b. Fiduciary Compliance

Financial Management: The project's financial management rating was moderately satisfactory at closing. The government's project team submitted non-audited Interim Financial Reports (IFRs) each semester which were accepted by the WB. While the ICR did not report on whether any external audits were conducted, the last Financial Management Implementation Support and Supervision Report (FMISSR) from June 28, 2024, noted that because the project was delayed in implementing funds, the first external



audit would cover the period from February 28, 2022, to December 31, 2023. At the time of writing the FMISSR, the audit was still under review.

Procurement: The project’s procurement rating was moderately unsatisfactory at the last Implementation Status and Results (ISR) report. The ICR noted that procurement delays began immediately after loan effectiveness in February 2022. A key issue for the procurement of the larger contracts was that they were multi-year investments, which required the implementing entity to submit a multi-annual budget that needed to be approved by the Ministry of Finance. The inability of the implementing agency, OCAVM, to get the multi-year budget submitted and approved required the unit to focus on activities that could be completed in one fiscal year. Of the eight activities that were to be procured in 2024, five were completed. The ICR noted that staff from OCAVM did not have prior experience with World Bank procurement policies and systems such as STEP and Client Connections and found it complex to manage both national government and World Bank procurement policies and processes. (ICR, p.16) This was exacerbated by frequent staff turnover.

c. Unintended impacts (Positive or Negative)

none

d. Other

none

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Unsatisfactory	Unsatisfactory	
Bank Performance	Moderately Unsatisfactory	Moderately Unsatisfactory	
Quality of M&E	Modest	Modest	
Quality of ICR	---	High	

12. Lessons

In addition to the lessons outlined in the ICR, the ICR Review identifies the following lessons:

World Bank Task Teams and Country Management Units can mitigate implementation challenges by better understanding the role that a country’s public financial management system plays in project implementation, and how constraints should be factored into the design. This project was relevant to the country’s development challenge and was technically



sound on the type of investments needed to strengthen the Cutzamala water system. However, similar to a predecessor water project, this project did not adequately assess the risks associated with the country's public financial management system as well as procurement. While the PAD acknowledged that investments that go beyond one year, to plan, procure, and complete, require multi-year investment planning and budgeting as required by the Ministry of Finance, this project suffered from the same implementation challenges as its predecessor Water Utilities Efficiency Improvement Project (P121195) implemented with CONAGUA. The transformative activities in this project were financing dam rehabilitation and upgrading of large bulk water transmission lines, projects that are more complex and require more than one year to complete. Stronger emphasis by the Task Team and the CMU at design and during implementation to engage with the Ministry of Finance to discuss public financial management requirements with implementing agencies may have set clearer expectations on what implementing entities need to do and constraints they faced, as well as establishing a realistic project time horizon for loan disbursements.

Projects that suffer from long delays in being declared effective may benefit from revisiting project closing dates early in implementation. This project suffered from a two-year delay between the World Bank Board approving the project, the government signing, and the Bank declaring it effective. When projects are designed during political transitions, as this one was, there is always a risk that a new administration will undertake a lengthy review to confirm if the project aligns with their priorities, and change technical and managerial staff in implementing agencies who were part of discussions during the design. In the Mexican context, after the 2018 presidential elections, all loans with international financing institutions were reviewed. The World Bank Board approved the project in February 2020, and the signing took place at the end of February 2022. Delays in determining which institution would be the financial intermediary were most salient. Because the World Bank considers implementation to begin with Board approval, the loss of two years meant that the project had three years and 10 months to implement before reaching the closing date. Given the sizeable investments and multi-annual budgeting and planning that were required, this shortened timeframe was likely unrealistic for the implementing agency, particularly given that delays in construction for larger infrastructure projects are not uncommon. The World Bank may have considered discussing with the Ministry of Finance whether extending the project before signing would have been an appropriate intervention to provide the implementing agency adequate time.

Technical assistance can be an effective way to strengthen capacity and build trust and relationships with implementing agencies. Although the World Bank investment lending is reduced, the overall dialogue and the program can still benefit from solid technical assistance. The World Bank can be agile and bring in just-in-time and high-value technical assistance based on its global knowledge. As demonstrated in this project, the dam safety expert the Task Team used helped the client make informed decisions and strengthened the client's capacity. Likewise, leadership workshops targeted to women were highly valued by CONAGUA's female employees. In both cases, the technical assistance helped strengthen organizational capacity and build trust between the Task Team and the implementing agency.

In upper-middle-income countries such as Mexico that have stronger government systems, the Bank may consider using national systems when the projects are not high risk. The ICR stated that the implementation entity found the management of two procurement policies (national and World Bank) to be complex. The project relied on existing government financial management and procurement staff who were managing resources from the federal government as well as



resources from the World Bank. In such cases, the World Bank and Task Teams may consider seeking waivers to use national procurement systems, easing the administrative burden on the implementing agencies. Likewise, exploring financing instruments that use government systems rather than Bank policy may also ease implementation challenges and allow World Bank Task Teams to focus on the development challenge. The ICR from a predecessor water Investment Financing Project (IPF) (P121195) similarly noted the Bank should focus on more flexible procurement arrangements for future projects. (ICR, P121195, p. 19)

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR is well written, concise, follows the guidelines, and provides a complete critique of the project at design and during implementation. The report is candid, accurate, and substantiated by field-level interviews. The report included a detailed analysis using a robust methodology to assess the effects of the interventions on the Cutzamala system's reliability, which was evidence to support the efficiency section of the report. The report is clear on how the ratings were reached based on the evidence available and what interventions were supported by the project. Lessons are rich, based on evidence and analysis and operational realities and experiences from the project.

a. Quality of ICR Rating High