



1. Project Data

Project ID P107350	Project Name MZ-Water Resources Dev I SIL	
Country Mozambique	Practice Area(Lead) Water	
L/C/TF Number(s) IDA-50110,IDA-53070	Closing Date (Original) 15-Dec-2017	Total Project Cost (USD) 86,914,725.92
Bank Approval Date 15-Sep-2011	Closing Date (Actual) 30-Jun-2020	
	IBRD/IDA (USD)	Grants (USD)
Original Commitment	70,000,000.00	0.00
Revised Commitment	96,958,920.05	0.00
Actual	86,914,725.92	0.00

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2. Project Objectives and Components

a. Objectives

The Project Development Objective (PDO) of the Water Resources Development Project (NWRDP) as articulated in the Project Appraisal Document (paragraph 16) was identical to the one stated in the Financing Agreement (FA, page 4) and aimed to:

"strengthen the development and management of national water resources and increase the yield of the Corumana Dam to augment water supply for the Greater Maputo Metropolitan Area (GMMA)."



The outcome of this project will be assessed based on a split rating because the target values of two outcome indicators were reduced as part of two restructurings.

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

The PDO was supported by the following four components:

1. Water Resources Management (estimated cost at appraisal: US\$15.00 million, actual cost: US\$16.15 million). This component aimed to enhance capacity at the national and regional level to address the challenges of water resources management in Mozambique and strengthen the framework for water resources development. The component would provide support to: (a) enhance water resources planning to enable the development of a national management system; (b) increase the capacity for negotiations, monitoring and compliance with international waters instruments; (c) strengthen the capacity of the Recipient's regional water authorities to develop strategies and studies to ensure the sustainable and equitable development of water resources in the Recipient's river basins, including, but not limited to, the Zambezi river; (d) develop and implement mechanisms to facilitate comprehensive water allocation, licensing, revenue and compliance with monitoring measures; and (e) develop a hydro-climatic information management system and related technical assistance. These activities would be supported through the provision of: i) consultants services and technical assistance; ii) goods and equipment, including hydro-climatic and water quality equipment, bulk meters, computers, vehicles and office equipment; iii) works to establish hydro-meteorological stations; iv) carrying out of training and capacity building activities to the sector; and, v) incremental operating costs to support DNA and the ARAs. It also includes support for the Panel of Experts for Dam Safety and Environmental and Social aspects through provision of Consultants Services.

2. Corumana Dam Completion (estimated cost at appraisal: US\$42.00 million, actual cost: US\$39.21 million). This component aimed to support completion of the Corumana Dam, through, inter alia the: (a) installation of spillway gates with repair works of concrete pillars/abutments; (b) construction of a saddle dam with an emergency spillway; (c) development of a monitoring system; (d) provision of safety equipment; and (e) adoption of dam safety measures. This would be achieved through the provision of: i) consulting services for detailed design and supervision and technical assistance within ARA-Sul to assist with implementation; ii) works required for completion of the Corumana Dam; and, iii) goods needed to support implementation.

3. Corumana Environmental and Social (estimated cost at appraisal: US\$5.50 million, actual cost: US\$4.02 million). This component aimed to ensure that completion of the Corumana Dam was compliant with the project safeguard instruments prepared by the Borrower and cleared by the Bank through implementation of: (a) the Environmental Management Plan; and (b) the Resettlement Action Plan (RAP),



including a Community Livelihood Plan. These would be supported through the provision of: i) consulting services and technical assistance; ii) works, including a water supply and sanitation program and community development measures in the vicinity of the Corumana Dam; and, iii) goods, equipment and incremental operating costs would be provided to assist with monitoring, stakeholder consultations and implementation. The Government would directly finance all cash compensation and land acquisition as part of the RAP.

4. Water Resources Development (estimated cost at appraisal: US\$35.00 million, actual cost: US\$27.53 million). This component aimed to address the infrastructure deficit through support to: (a) prepare feasibility studies, tender designs, strategic assessments and river basin plans and develop a pipeline of future water resource investments in the Recipient's territory; and (b) prepare environmental and social assessments for future potential water sector related investments in the Recipient's territory. This would be supported through the provision of: i) consulting services and technical assistance for the detailed design of water resources infrastructure, water supply networks and distribution systems, along with the preparation of environmental and social safeguards instruments; and, ii) operating expenses associated with workshops, training and capacity enhancement initiatives.

Revised Components. The 2013 Additional Financing (AF) for US\$32 million increased the scope of the project. Specifically, Components 1 and 4 included the following new activities:

1. Water Resources Management (US\$4.00 million). New activities included integrated flood management and mitigation studies for the Limpopo River basin in Mozambique to inform longer-term infrastructure investments and planning.
4. Water Resources Development (US\$28.00 million). New activities included: (i) emergency civil works to rehabilitate and reconstruct prioritized dykes and levees; (ii) rehabilitation of the Macarretane Barrage on the Limpopo River, including hydro-mechanical works, gate control system, reinforcement of foundations, and the rehabilitation of office buildings; (iii) TA and supervision associated with the emergency civil works; and, (iv) other improvements to the existing infrastructure of dykes and levees.

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

Project Cost. The total project cost was estimated to be US\$83.75 million, including US\$4.50 million contingencies (PAD, page 7, Table 1). This amount was revised upwards to US\$115.75 million after the project received additional IDA financing worth US\$32 million in 2013 (see below for details). The actual cost according to the ICR Data sheet was US\$86.91 million, which was about US\$28 million lower than the anticipated cost. According to the ICR (paragraph 15), part of the difference stemmed from the forgoing of the Pilot Program for Climate Resilience (PPCR-which became a standalone project) financing (worth US\$10 million). Also, counterpart funding for RAP implementation did not materialize. Furthermore, the November 2019 restructuring cancelled US\$5 million, in addition to which the exchange rate depreciation which led to a significant reduction in IDA funding.

Financing. The project was financed through a Specific Investment Loan (SIL) comprising an International Development Association (IDA) Credit of US\$70.00 million Special Drawing Rights (SDR) equivalent, to be implemented over six years. According to the PAD (paragraph 24) "selection of the SIL was premised on the flexibility and its suitability to incorporate financing for a broad range of activities including a number of specific investments across the country, technical assistance and capacity enhancement measures." In 2013, the project received an Additional Financing (AF) from IDA resources for US\$32 million. The total IDA



financing was US\$102 million. This amount was revised down to US\$96.96 million. The actual disbursed amount according to the ICR Data Sheet was US\$86.91 million (89.6 percent of the revised amount). As mentioned above, the difference stemmed from the cancellation of US\$5.00 million as part of the November 2019 restructuring, combined with significant exchange rate depreciation (ICR, paragraph 15).

Dates. The project was approved on September 15, 2011 and became effective four and half months later on January 31, 2012. The Mid-Term Review (MTR) was conducted on December 15, 2014. The PAD did not state a date for the MTR. That said, conducting the MTR after three years into implementation was reasonable given that the original anticipated implementation period was six years. The project closed on June 30, 2020, which was about thirty months (2.5 years) later than the original closing date on December 15, 2017. The extension of the closing date allowed more time to implement the ESIA and the RAP and accommodated delays in procurement for the Corumana Dam (ICR, paragraph 59). It is worth noting that in 2013, the project received US\$32 million as additional financing “to finance the costs of emergency rehabilitation of civil works (e.g., dykes and levees) following the extreme flooding in southern Mozambique (ICR, paragraph 10).”

The project was restructured three times, all Level Two restructurings, as follows:

1. On September 27, 2013, when the amount disbursed was US\$5.38 million, as part of an Additional Financing (AF) from IDA resources for US\$32 million, equivalent, to finance the costs of emergency rehabilitation of civil works (e.g., dykes and levees) following the extreme flooding in southern Mozambique, along with longer-term interventions for improved flood management and mitigation. The restructuring included changes to the monitoring and evaluation (M&E) framework to reflect the introduction of new project activities, changes in components and cost, reallocation between disbursement categories, change in disbursements arrangements, and change in Legal Covenants.
2. On December 8, 2017, when the amount disbursed was US\$40.09 million, primarily to extend the closing date by 23 months, from December 15, 2017 to November 14, 2019, and to adjust an outcome-level target and several intermediate indicators, change in the implementation schedule, and changes in components and cost.
3. On November 12, 2019, when the amount disbursed was US\$68.39 million, in order to further extend the closing date by 7.5 months to June 30, 2020 and adjust the target of another PDO indicator. Also, changes were made to components and cost, and implementation schedule, reallocation between disbursement categories, and US\$5.00 of IDA funds were cancelled.

This review is in agreement with the argument reported in the ICR (paragraph 18) which stated that the changes in the three restructurings “had mixed implications on the theory of change.” On one hand, the AF supported the project’s objective of strengthening water resources management, improving water security, and improving resilience to climate change by rehabilitating hydraulic infrastructure destroyed in the 2013 floods and by improving longer-term flood management and mitigation. On the other hand, the preparation of the Pilot Program for Climate Resilience project as a standalone operation meant that the NWRDP made very little direct contribution to improving the country’s hydro-climatic monitoring system and its associated long-term goals of improved economic planning and climate change preparedness. In addition, dropping the national water allocation and revenue management system reduced the project’s scope to affect sustainable management of water resources.



3. Relevance of Objectives

Rationale

Context at Appraisal. Mozambique is one of the world's poorest countries and its achievements in poverty reduction mask significant regional variations, and persistent, high levels of absolute poverty and malnutrition. It ranks third amongst the African countries most exposed to risks from multiple weather-related hazards and major floods, cyclones and droughts have a significant impact on the country's economy. Access to improved water and sanitation services remains low, despite the success of recent reforms which have helped to strengthen sector institutions and the regulatory framework. Seventy five percent of the current production capacity for water supply serves the Greater Maputo Metropolitan Area (GMMA), almost exclusively from the Pequenos Libombos Dam on the Umbeluzi River. However, this is now fully committed and there is already an existing water deficit, requiring development of alternative source to secure a reliable supply for the city of Maputo and surrounding metropolitan areas. The project aimed to strengthen the development and management of national water resources and increase the yield of the Corumana Dam to augment water supply for the Greater Maputo Metropolitan Area.

Previous Bank Experience. The Bank was engaged in the water sector in Mozambique since 1998. A Country Water Resources Assistance Strategy (CWRAS) was prepared by the Bank in 2007. This provided an analysis of the changing socio-economic circumstances to assist in the identification of a prioritized set of interventions directed toward the sustainable development and management of water resources. The CWRAS also directed the Bank's support in water resources to maximize the impact on long-term poverty reduction and economic growth within the context of the approach and priorities of the FY08-11 CPS. It was also used to identify the Bank's specific strengths with respect to other development partners and, at the same time, promote donor coordination and cooperation in the water resources sector in the identified priority areas of interventions. Experience also included the IDA-financed National Water Development Project 1 and 2 (PNDA - Programa Nacional de Desenvolvimento de Águas). The Bank also implemented similar projects regionally as well as in other areas in the world.

Consistency with Government Strategies. At appraisal, the PDO was in line with the Government of Mozambique's (GoM) National Water Resources Development Program. This includes a number of critical interventions to support implementation of measures envisaged under the Water Policy, the National Water Resources Management Strategy and the Regulations for Licenses and Concessions. The PDO was also in line with the Water Policy (Política de Águas - PA) which was based on an integrated approach to water resources management embedded within the principles of sustainable use. The goals of the PA included satisfying the basic needs of water supply for human consumption, improving sanitation, efficient use of water for the economic development, water for environmental conservation, reducing vulnerability to floods and droughts and promoting peace and regional integration while also guaranteeing water resources for the development of Mozambique.

At completion, the PDO remained in line with the GoM's national and sectoral priorities. The PDO was in line with Mozambique's 2015-2035 National Development Strategy. Specifically, it was in line with the pillars on infrastructure development to support the sustainable management of water resources, and innovation and technological development to support the management of natural resources. The PDO was also in line with the Government's Five-Year Program for 2020-2024 (Proposta do Programa Quinquenal do Governo) which emphasized inclusive and sustainable growth, social and economic stability, economic productivity and competitiveness, and climate change as its main priorities. The project directly supported the program's



strategic objectives of infrastructure development, which specifically referenced the rehabilitation and development of dams and other hydraulic infrastructure, the strengthening of natural resources management, and the need to reduce climate-related risks. The PDO was also in line with the 2013-2025 National Strategy for Adaptation and Mitigation to Climate Change, which proposed priority actions to reduce climate risk and strengthen early warning systems; and (ii) the Master Plan for Water Resources Management in Mozambique, which highlighted the Corumana Dam for priority rehabilitation and analyzed national water resources and proposed the rehabilitation and development of hydraulic infrastructure, ground water resources, and drainage of inland rainwater.

Consistency with Bank Strategies. At appraisal, the PDO was in line with the Bank's strategy for Africa (Africa's Regional Strategy-2011) that sought to close Africa's infrastructure gap to drive productive development of urban growth poles and to build resilience to climate change and natural disasters. Specifically, with the regional strategy's two pillars: (i) Competitiveness and Employment, and (ii) Vulnerability and Resilience. The PDO was also in line with the Bank's Country Partnership Strategy (CPS-FY2007-FY2011), Pillar II of the CPS "Equitable access to key services", through Result Area #3: "Improved government effectiveness in the provision of services", via Outcome 8: "Increased access to potable water"-by providing upstream infrastructure for bulk water supply, and Pillar III: "Sustainable and Broad-based Growth" of the CPS-through contributing directly to Result Area #5: "Strengthened economic growth potential", specifically Outcome 17: "Improved sustainable management of water resources" and Outcome 18: "Enhanced capacity to respond to disasters".

At completion, the PDO remained in line with Bank's Country Partnership Strategy (CPS) for FY17-21. The CPS highlighted the key ongoing challenges of developing and managing the country's water resources including: addressing the country's infrastructure deficit; improving basic services such as access to safe water, sanitation, and hygiene; and reducing the country's vulnerability to weather-related shocks. The project directly supported Pillar III of the CPS, "Enhancing Sustainability and Resilience" which identifies adequate access to infrastructure resources and services as a key driver of growth and poverty alleviation. The project also contributed to two Focus Areas of "Promoting Diversified Growth and Enhanced Productivity" and "Investment in Human Capital", given the role water resources play in productivity and human development. Finally, the PDO was in line with the CPS objectives of improving management of climate risks and natural resources, improving access to water and sanitation, promoting inclusive urbanization and decentralization.

Relevance of Objectives is rated Substantial. The PDO statement was clear and focused, but lacked a specific connection to higher level objectives, namely, ensuring equitable and efficient utilization of water supply services, disaster preparedness and building climate resiliency. The downstream intake, water treatment, and conveyance system to supply water to Greater Maputo would be supported by the Greater Maputo Water Supply Expansion Project (GMWSEP).

This Review is in agreement with the ICR that the "PDO was challenging, but not overly ambitious (paragraph 19)." The Bank has had extensive experience in the country backed by a water sector portfolio which amounts to more than US\$700 million. The PDO reflected the GoM's priorities with regards to water security and natural disaster response and was in line with the Bank's CPFs both at appraisal and completion.



Rating

High

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

Objective 1. To strengthen the management of national water resources.

Rationale

Theory of Change (ToC). The NWRDP sought to build water resource management capacity at the regional and national levels. This would be achieved through building capacity to manage international waterways, installing hydroclimatic stations and signing and implementing international waterways agreements. To develop water resources the project would develop river basins plans, rehabilitate existing hydro-infrastructure and develop studies for additional dam projects. These activities were expected to result in strengthening the development and management of national water resources. Anticipated long-term impacts included: ensuring equitable and efficient utilization of water supply services, availability of water for productive purposes, disaster preparedness and building climate resiliency.

The achievement of the stated PDO was underpinned by the following assumptions: 1. The Pilot Program for Climate Resilience (PPCR)-hydro-met project was approved to co-finance NWRDP; 2. Timely undertaking of procurement activities; 3. Timely completion of physical and mechanical works to allow time for testing, impoundment and commissioning of works; and 4. Sustained capacity at the national and regional levels to manage water resources.

The activities included in the ToC were directly linked to the stated PDO in a valid causal chain. The ToC delineated the key assumptions that underpinned the achievement of the PDO. However, the preparation of the Pilot Program for Climate Resilience project as a standalone operation meant the NWRDP had very little contribution to improving the country's hydro-climatic monitoring system and its associated long-term goals of improved economic planning and climate change preparedness. In addition, dropping the national water allocation and revenue management system reduced the project's scope to affect sustainable management of water resources.

Outputs

The following outputs were reported in the ICR (Annex 1) unless referenced otherwise:

1. Strengthening the management of national water resources

- Training was provided on international water law, negotiations, mediation, water conflict management.
- The project financed the development of the National Strategic Action Plan to Monitor the Compliance of International Shared Watercourse Agreements.



- Two new irrigation canals in the Limpopo Valley. The ICR reported this as an output, but no further information was given.
- Integrated flood management plan for the Limpopo developed to help manage flooding.
- Training, capacity building, institutional strengthening activities

Outcome

The scope of this objective was reduced after the Pilot Program for Climate Resilience (PPCR) did not co-finance the project to modernize the country's hydro-meteorological system, but instead PPCR was approved as separate stand-alone project (ICR, paragraph 24). Therefore, none of the outcomes stemming from the work on the hydro-meteorological system could be attributed to the NWRDP. Despite that, the associated outcome indicator "percent of hydroclimatic stations operating and reporting" was not dropped from the RF; as such, it did not provide a complete account of all the anticipated outcomes under this objective.

According to the ICR (paragraph 24), five outcomes/intermediate outcomes were used to assess the achievement of this objective as follows:

(a) Improved capacity to negotiate and comply with international waters instruments. The project provided support for the Government of Mozambique to collaborate with other riparian countries to review and update two agreements on international waters, namely the Interim IncoMaputo Agreement between Mozambique, Eswatini and South Africa, and the Púngue and Búzios Watercourses Agreement between Mozambique and Zimbabwe. Both agreements were signed by all riparians, which exceeded the target of reviewing one agreement and updating another. The project also financed the development of the National Strategic Action Plan to Monitor the Compliance of international Shared Watercourses Agreements. According to the ICR (paragraph 26) "the action plan gives the GoM a much-needed road map to monitor, negotiate, and enforce international river agreements."

(b) Informed sustainable and equitable management of priority river basins through strategies and studies. The project financed three river basin plans to improve sustainable, equitable and participatory management of water resources in the Zambezi, Lúrio, and Limpopo river basins. According to the ICR (paragraph 27), "these plans contained a comprehensive monograph of land use, water availability, current and planned water demand, socio-economic conditions, environmental and water quality, and legal and institutional framework. Moreover, the plans analyzed the mandate, core functions, technical and management capacity to meet institutions' goals, mission, and functions of river basin authorities."

(c) Informed long-term infrastructure investment planning in the Limpopo River basin through an integrated flood management and mitigation study. The integrated flood management study included structural and nonstructural measures to help prevent and manage flooding in one of the most flood-prone areas in the country. It sets out structural and non-structural measures on flood management. Also, the plan outlined the role of state and non-state actors across several sectors at the local, provincial, and national levels. The plan called for strengthening and management of the flood early warning system and the information and communication management systems for national emergencies, and introduction of drought-resistant crops (ICR, paragraph 29). Through this study, the project contributed to better flood management and prevention.



(d) Informed flood management preparedness through a decision support system (DSS). The DSS was expected to integrate multiple decision making criteria, a collection of methodologies, such as remote sensing, geographic information system, hydrologic models, and real-time flood information systems; to compare, select, or rank multiple alternatives to elicit and model flood preferences of stakeholders; and improve the coordination across agencies, organizations and affected citizens. According to the ICR (paragraph 30) "the DSS is operating effectively and informing decision making."

(e) Improved capacity through extensive capacity building. According to the ICR (paragraph 31) the training improved technical and managerial capacity of the Regional Water Administration (ARA) staff who demonstrated the ability to process and analyze data of hydrological reports, as opposed to just collecting and storing data before the project. Also, the project-provided training improved management systems of National Directorate for Water Resources Management (DNGRH) and ARA.

Based on the above-mentioned assessment, it is plausible to assume that the achievement of these results on aggregate strengthened water resources management, despite dropping the work on the hydro-meteorological system.

On this basis, the efficacy of achieving this objective is rated Substantial.

Rating

Substantial

OBJECTIVE 2

Objective

Objective 2. To strengthen the development of national water resources.

Rationale

Theory of Change (ToC). The NWRDP sought to strengthen the development of national water resources through developing river basins plans, rehabilitating existing hydro-infrastructure and developing studies for additional dam projects. These activities were expected to result in strengthening the development of national water resources. Anticipated long-term impacts included: ensuring equitable and efficient utilization of water supply services, availability of water for productive purposes, disaster preparedness and building climate resiliency.

The achievement of the stated PDO was underpinned by the following assumptions: 1. Timely undertaking of procurement activities; 2. Timely completion of physical and mechanical works to allow time for testing, impoundment and commissioning of works; and 3. Sustained capacity at the national and regional levels to manage water resources.

The activities included in the ToC were directly linked to the stated PDO in a valid causal chain. The ToC clearly delineated the key assumptions that underpinned the achievement of the PDO.

Outputs



The following outputs were reported in the ICR (Annex 1), unless referenced otherwise:

- Technical designs for three small dams and associated water supply networks and distribution systems completed (target achieved).
- Environmental and social impact assessments completed to allow the dams to go to tender completed (target achieved).
- River basin plans for the Limpopo, Zambezi, and Lurio river basins.
- Rehabilitated dykes, levees, 50 kilometers (km) of dyke system were rehabilitated under the project, protecting a population of about 287,100 people and 45,000 hectares (ha) of agricultural fields (ICR, paragraph 36).
- Rehabilitated Macarretane barrage. The rehabilitation works focused on three main activities: the hydromechanical works, the gate control system and reinforcement of the foundation (ICR, paragraph 37)

Outcome

This objective, which aimed to help address Mozambique's infrastructure deficit in the water sector, was to be assessed through the outcome indicator measuring the number of river basin plans. The project only financed three out of an original target of nineteen plans (about 16% achievement rate) including those for the Limpopo, Zambezi, and Lúrio (ICR, paragraph 33). The ICR attributed this shortcoming on achieving the target to "budget constraints (paragraph 33)." The three river basin plans prepared by the project contained river basin development scenarios and strategic investment plans. The plans entailed critical investments in the order of US\$2 billion for the Limpopo River Basin, US\$1.8 billion for the Zambezi River Basin, and US\$570 million for the Lúrio River Basin (ICR, paragraph 34). The implementation of these plans was expected to be long-term over 25 years (2020-2045). The ICR did not clarify whether implementation started nor what sources of funding would be used to fund the afore-mentioned plans. The ICR (table 3) stated that the project "leveraged financing from GoM and development partners to finance an additional 4 (plans)." According to the ICR (paragraph 33) "all plans were based off similar terms of references and followed the same template with similar content."

Other project achievements included:

1. Financing the detailed technical designs, including for water supply networks, distribution systems, and environmental and social impact assessments for the Gorongosa, Metuchira and Ressano Garcia dams. According to the ICR (paragraph 35) "the achievement exceeded expectations as the original plan was to only undertake feasibility studies. Based on these outputs, the three dams were immediately ready for tendering."
2. Rehabilitating flood protection dikes and other hydraulic infrastructure of the Limpopo River basin following the 2013 floods. The Bank used Additional Financing to fund civil works, TA, and supervision to reconstruct dikes, weirs, and levees in communities along the Limpopo River, in one of the country's most significant agricultural areas. However, the works rehabilitated the dikes to sustain a one in 20-year flood event rather than a one in 50-year flood. The ICR (paragraph 36) attributed this shortcoming to the requirement to build "a much larger system, which was beyond the scope, budget, and timeframe of the project."
3. Rehabilitation of the Macarretane dam which was part of a multifunctional infrastructure system providing flood protection, all-season water supply, irrigation, and transportation. According to the ICR (paragraph 37) "completion of these works has had an important economic impact, given the role the Chokwe irrigation



system plays in one of the main irrigated areas in the country, which the Government recently declared as a Special Economic Zone. The inauguration of the rehabilitated dam took place in September 2020 and the dam is once again supplying water to about 12,000 producers across 35,000 hectares in Chokwe."

Based on the above-mentioned assessment, the project fell short on achieving its main outcome indicators "number of river basins plans".

On aggregate, the efficacy of achieving this objective is rated Modest.

Rating

Modest

OBJECTIVE 2 REVISION 1

Revised Objective

Objective 2. To strengthen the development of national water resources.

Revised Rationale

Theory of Change (ToC). The same ToC applies as the objective was not changed, but there was a revision in the outcome indicator. The target value for "river basins covered with management plans" decreased from 19 to 12 to better align with the project budget.

Outputs

same as above

Outcome

The project rehabilitated flood protection dikes and other hydraulic infrastructure of the Limpopo River basin following the 2013 floods. The Bank used Additional Financing to fund civil works, TA, and supervision to reconstruct dikes, weirs, and levees in communities along the Limpopo River, in one of the country's most significant agricultural areas. While the rehabilitation of the dikes was done to sustain a one in 20-year flood event rather than a one in 50-year flood as envisioned, this rehabilitation returned the dikes to their pre-2013 floods status. The ICR (paragraph 36) attributed this shortcoming to the requirement to build "a much larger system, which was beyond the scope, budget, and timeframe of the project."

The Macarretane dam, which was part of a multifunctional infrastructure system providing flood protection, all-season water supply, irrigation, and transportation, was also rehabilitated. The rehabilitation works focused on three main activities: the hydromechanical works, the gate control system and reinforcement of the foundation. According to the ICR (paragraph 37) "completion of these works has had an important economic impact, given the role the Chokwe irrigation system plays in one of the main irrigated areas in the country, which the Government recently declared as a Special Economic Zone. The inauguration of the rehabilitated dam took place in September 2020 and the dam was once again supplying water to about 12,000 producers across 35,000 hectares in Chokwe."



As mentioned above, the project financed three out of the revised target of twelve plans (baseline was five plans) including those for the Limpopo, Zambezi, and Lúrio rivers (ICR, paragraph 33). The project leveraged financing from the GoM and other development partners to finance four more plans that followed the same template with similar content.

Overall, the project achieved notable outcomes including: the rehabilitation of the flood protection dikes and other hydraulic infrastructure of the Limpopo River basin, the rehabilitation of the Macarretane dam, completing the technical designs of three dams, and completing seven river basin plans, which in addition to five existing plans (baseline) meant that the project achieved its revised outcome target of 12 river basin plans.

Based on the above-mentioned assessment, the efficacy of achieving this objective is rated Substantial despite some shortcomings.

Revised Rating

Substantial

OBJECTIVE 3

Objective

Objective 3. To increase the yield of the Corumana Dam to augment water supply for GMMA

Rationale

Theory of Change (ToC). To increase the yield of the Corumana Dam, the project sought to complete the Dam itself, which was left without spillway gates and other features when constructed in 1989, thereby resulting in increased reservoir capacity, dam yield, bulk water supply, and climate resilience. The project financed the design, supervision, and the hydromechanical works, the completion of which increased reservoir capacity, dam yield, bulk water supply, and improved climate resilience. A separate Bank-financed project, the Greater Maputo Water Supply Expansion Project (GMWSEP), will allow for the actual abstraction, treatment, conveyance, and distribution of water to households in the GMMA. The GMWSEP was set to close in September 2021 with the water treatment plant already commissioned and with the project on track to distributing 60,000 m³/day to the GMMA (ICR, paragraph 38).

The achievement of the stated PDO was underpinned by the following assumptions: 1. Timely undertaking of procurement activities; 2. Timely completion of physical and mechanical works to allow time for testing, impoundment and commissioning of works; and 3. Sustained capacity at the national and regional levels to manage water resources.

The activities included in the ToC were directly linked to the first part of the PDO (to increase the yield of the Corumana Dam) in a valid causal chain. The ToC delineated the key assumptions that underpinned the achievement of the PDO. However, the second part of the PDO (to augment water supply for GMMA) was addressed by a separate stand-alone bank-financed project.



Outputs

The following outputs were reported in the ICR (Annex 1) unless referenced otherwise:

- Completion of the Corumana Dam with new spillway gates, saddle dam, repairs to concrete pillars, installation of hydro-mechanical and control equipment, control room.
- New dam safety monitoring system, including pressure relief wells, v-notch outlet structures, toe drain.
- New O&M manual.
- New Emergency Preparedness Plan.
- Consultations with local authorities, basin management committees, disaster management personnel, first responders.
- Training, capacity building, institutional development activities.

Outcome

The completion of the Corumana Dam works increased the dam's Full Supply Level (FSL) from from 111meters above sea level (mASL) to 114 mASL compared to an original target of 117 mASL, and increased the reservoir storage capacity from 720 million cubic meters (Mm3) to 960 Mm3 compared to an original target of 1240 Mm3. These changes, in turn, increased the dam's yield from 299.8 Mm3/year (yr) to 311.4 Mm3/yr compared to an original target of 322.1 Mm3/yr, resulting in an incremental yield of 11.6 Mm3/yr compared to an original target of 22.3 Mm3/yr at a 98% confidence interval. As a result, bulk water supply available from Corumana to the GMMA was estimated to increase from 69 Mm3/yr to 81 Mm3/yr compared to an original target of 86 Mm3/yr. The ICR (paragraph 44) explained that "the incremental yield of 16.8 Mm3/yr was reduced to 11.6 Mm3/yr due to hydrological studies and new regulations, which necessitated a redesign of the dam, including a new auxiliary spillway in the left embankment (to be completed under a separate project) to ensure safe discharge during maximum flood events."

Based on the above-mentioned information, the project fell short on achieving all its targets regarding the dam yield, incremental yield and bulk water supply available to GMMA. Therefore, efficacy of achieving this objective is rated Modest.

Rating

Modest

OBJECTIVE 3 REVISION 1

Revised Objective

Objective 3. To increase the yield of the Corumana Dam to augment water supply for GMMA

Revised Rationale

Theory of Change (ToC). Same as above. The PDO was not changed, but the dam was redesigned in 2017. However, outcome targets for the incremental reservoir yield available from Corumana Dam for GMMAs and the storage Capacity Corumana Dam shown were revised downwards (as shown below) as part of the November 2019 restructuring.



According to the Restructuring Paper (2019, paragraph 6) "the reservoir yield target for Corumana Dam was based on the original design of the project which included the installation of six spillway gates and a saddle dam with an earth fuse plug to act as an emergency spillway. However, during project implementation, it became clear that the fuse-plug on the saddle dam could no longer play the role of an emergency spillway as the downstream area of this saddle dam, free of people during project preparation, was now inhabited by hundreds of people who would be in harm's way if the fuse-plug were activated. Based on advice from the Panel of Experts (PoE), it was decided in February 2016 that, instead of equipping the saddle dam with the fuse plug element, an auxiliary spillway would be constructed in the left embankment of the dam. The construction of the auxiliary spillway, estimated at around US\$40 million, would be undertaken through a separate project. Until the auxiliary spillway is constructed, the FSL is restricted to 114 m (instead of 117 m), which corresponds to a reservoir yield of 960 Mm³. Consequently, the incremental reservoir yield available from Corumana Dam for GMMA will be reduced from 16.8 Mm³/year to 11.6 Mm³/year."

Outputs

same as above

Outcome

The completion of the Corumana Dam increased reservoir capacity, dam yield, bulk water supply, and improved climate resilience. The completion of the hydromechanical works financed by the project allowed the dam's FSL to rise from 111 mASL to 114 mASL and to increase the reservoir storage capacity from 720 million cubic meters (Mm³) to a revised target of 960 Mm³ (targets achieved). These changes, in turn, increased the dam's yield from 299.8 Mm³/year (yr) to 311.4 Mm³/yr, resulting in an incremental yield of 11.6 Mm³/yr (both targets achieved) at a 98% confidence interval. As a result, bulk water supply available from Corumana to the GMMA was estimated to have increased from 69 Mm³/yr to 81 Mm³/yr (target achieved). However, fully achieving this objective "is dependent on completion of remaining finishing works, dam safety measures, dam impoundment and commissioning, as well as pending RAP and LRP activities (ICR, paragraph 84)."

Based on the above-mentioned information, the project achieved all of its revised targets.

On this basis, the efficacy of achieving this objective is rated Substantial.

Revised Rating

Substantial

OVERALL EFFICACY

Rationale



Pre-restructuring. The evidence provided in the ICR point to the success of the project in strengthening water resources management (objective 1), despite dropping the work on the hydro-meteorological system. However, the project achieved mixed results on strengthening the development of national water resources (Objective 2). It fell short on achieving the main outcome indicators "number of river basins plans" and fell short on rehabilitating the hydraulic infrastructure of the Limpopo River to the expected level of one in 50-year flood. On the other hand, the project succeeded in the rehabilitation of the Macarretane dam and in financing and completing the technical designs of three dams. Finally, to increase the yield of the Corumana Dam to augment water supply for GMMA (objective 3), the project fell short on achieving all its targets regarding the dam yield, incremental yield and bulk water supply available to GMMA.

Therefore, and based on the above-mentioned assessment, the overall efficacy is rated Modest.

Overall Efficacy Rating
 Modest

Primary Reason
 Low achievement

OVERALL EFFICACY REVISION 1

Overall Efficacy Revision 1 Rationale

2017 Restructuring. The evidence provided in the ICR point to the success of the project in strengthening water resources management (objective 1), despite dropping the work on the hydro-meteorological system. The project achieved notable results on strengthening the development of national water resources (Objective 2). In total seven comprehensive river basin plans were developed. The project also rehabilitated the hydraulic infrastructure of the Limpopo River and the Macarretane dam; and financed and completed the technical designs of three dams. Finally, to increase the yield of the Corumana Dam to augment water supply for GMMA (objective 3), the project fell short on achieving all its targets regarding the dam yield, incremental yield and bulk water supply available to GMMA.

On balance, and based on the above-mentioned assessment, the overall efficacy is rated Substantial despite shortcomings.

Overall Efficacy Revision 1 Rating

Substantial

OVERALL EFFICACY REVISION 2

Overall Efficacy Revision 2 Rationale

2019 Restructuring. The evidence provided in the ICR point to the success of the project in strengthening water resources management (objective 1), despite dropping the work on the hydro-meteorological system. The project achieved notable results on strengthening the development of national water resources (Objective 2). In total seven comprehensive river basin plans were developed. The project also rehabilitated the hydraulic infrastructure of the Limpopo River and the Macarretane dam; and financed and completed the technical designs of three dams. Finally, to increase the yield of the Corumana Dam to



augment water supply for GMMA (objective 3), the project achieved all of its its targets regarding the dam yield, incremental yield and bulk water supply available to GMMA.

Therefore, and based on the above-mentioned assessment, the overall efficacy is rated Substantial.

Overall Efficacy Revision 2 Rating

Substantial

5. Efficiency

Economic and Financial Efficiency

ex-ante

The economic and financial analysis (EFA) at appraisal estimated the Economic Internal Rate of Return (EIRR) at 12.3%. The EIRR estimation was based on a 45-year period at the opportunity costs of capital at 12%. An economic cost-benefit analysis (CBA) was carried out to assess the economic viability of the project. The primary benefits from completing the Corumana Dam were expected to accrue from the increase of water available to supply the GMMA. The sensitivity analysis demonstrated low sensitivity to increases in the water conveyance costs, withstanding an increase up to 20% in the conveyance costs for any of the options assessed.

ex-post

The EFA at completion estimated the EIRR at 9.9% compared to 12.3% at appraisal. A 45-year project life period and O&M cost at 0.3% per year against capital expenditure were assumed. Following the Bank guidance issued in 2016, a revised discount rate of 6% was used instead of the 12% used at appraisal (ICR, paragraph 48). The costs and benefits were converted to 2011 prices in order to compare them against what was projected at appraisal. Benefits accrued from the Corumana dam completion were estimated using the same approach as that done at appraisal. Assumptions included i) household benefits by increased water supply; ii) reduced flood damage; iii) increased hydropower generation and iv) increased catch of local fisheries. The benefit from increased water supply comprised the majority (90+ percent) of total benefits.

Efficiency was negatively impacted by two main factors:

1. Delayed implementation as major civil works relating to the Corumana dam contract did not begin until 2017, about five years after effectiveness.
2. The revision of the Corumana dam design in 2016, which included the cancellation of the fuse plug at the saddle dam and the addition of an auxiliary spillway would require two years to build and would have an estimated cost at US\$40 million. This meant that until the auxiliary spillway was built and operational, the Corumana dam reservoir needs to operate at a Full Supply Level (FSL) of 114 mASL, compared to the original design at FSL of 117 mASL, resulting in an incremental water yield of 11.6 Mm³/yr, compared to the original target of 16.8 Mm³/yr.



As a result of the afore-mentioned reasons, there would be a delay in benefit yield, since the Corumana dam reservoir needs to be operated at 114 mASL, instead of the original target of 117 mASL, until the completion of auxiliary spillway. The 2019 Restructuring Paper (paragraph 20, table 2) stated that "the Economic Internal Rate of Return is estimated at 12%, with a dam operating constantly at an FSL of 114.00 m."

Administrative and Institutional Efficiency

The project closed thirty months beyond the original closing date. This delay was expected to negatively impact the benefit streams from the project investments. The project suffered from extensive implementation delays related to the dam construction. Also, procurement bottlenecks resulted in a two-year delay to start contracts. Further, "delays in procurement for the Corumana Dam had a cascading effect on non-dam related contracts (ICR, paragraph 59)."

Efficiency is rated Modest. The ex-post ERR was lower than the expected ERR at appraisal (9.9% compared to 12.3% at appraisal), and the project suffered from extensive delays that were expected to negatively impact the benefit streams from the project investments.

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	✓	12.30	0 <input checked="" type="checkbox"/> Not Applicable
ICR Estimate	✓	9.90	0 <input checked="" type="checkbox"/> Not Applicable

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

6. Outcome

Pre-restructuring. Relevance of Objectives was rated High. Overall efficacy was rated Modest. The evidence provided in the ICR point to the success of the project in strengthening water resources management (objective 1), despite dropping the work on the hydro-meteorological system. However, the project achieved mixed results on strengthening the development of national water resources (Objective 2). It fell short on achieving the main outcome indicators "number of river basins plans" and fell short on rehabilitating the hydraulic infrastructure of the Limpopo River to the expected level of one in 50-year flood. On the other hand, the project succeeded in the rehabilitation of the Macarretane dam and in financing and completing the technical designs of three dams. Finally, to increase the yield of the Corumana Dam to augment water supply for GMMA (objective 3), the project fell short on achieving all its targets regarding the dam yield, incremental yield and bulk water supply available



to GMMA. Efficiency was rated Modest due to lower ex post ERR compared to appraisal and significant implementation delays.

Based on a High rating for Relevance of Objectives, and Modest rating for both Efficacy and Efficiency, Outcome is rated Moderately Unsatisfactory.

2017 Restructuring. Relevance of Objectives was rated High. Overall Efficacy was rated Substantial. The evidence provided in the ICR point to the success of the project in strengthening water resources management (objective 1), despite dropping the work on the hydro-meteorological system. The project achieved notable results on strengthening the development of national water resources (Objective 2). In total seven comprehensive river basin plans were developed (Objective 2). The project also rehabilitated the hydraulic infrastructure of the Limpopo River and the Macarretane dam; and financed and completed the technical designs of three dams. Finally, to increase the yield of the Corumana Dam to augment water supply for GMMA (objective 3), the project fell short on achieving all its targets regarding the dam yield, incremental yield and bulk water supply available to GMMA. Efficiency was rated Modest due to lower ex post ERR compared to appraisal and significant implementation delays.

Based on a High rating for Relevance of Objectives, and Substantial rating for Efficacy and a Modest rating for Efficiency, Outcome is rated Moderately Satisfactory.

2019 Restructuring. Relevance of Objectives was rated High. The evidence provided in the ICR point to the success of the project in strengthening water resources management (objective 1), despite dropping the work on the hydro-meteorological system. The project achieved notable results on strengthening the development of national water resources (Objective 2). In total seven comprehensive river basin plans were developed (Objective 2). The project also rehabilitated the hydraulic infrastructure of the Limpopo River and the Macarretane dam; and financed and completed the technical designs of three dams. Finally, to increase the yield of the Corumana Dam to augment water supply for GMMA (objective 3), the project achieved all of its revised targets regarding the dam yield, incremental yield and bulk water supply available to GMMA. Efficiency was rated Modest due to lower ex post ERR compared to appraisal and significant implementation delays.

Based on a High rating for Relevance of Objectives, a Substantial rating for Efficacy, and Modest rating for Efficiency, Outcome is rated Moderately Satisfactory.

Split Rating

	Pre- Restructuring	2017 Restructuring	2019 Restructuring
Relevance of Objectives	High	High	High
Efficacy (PDO):			
1.Strengthen the management of national water resources	Substantial	Substantial	Substantial



2. Strengthen the development of national water resources	Modest	Substantial	Substantial
3. Increase the yield of the Corumana Dam to augment water supply	Modest	Modest	Substantial
Efficiency	Modest	Modest	Modest
Outcome ratings	MU	MS	MS
Numerical value of the outcome rating	3	4	4
Disbursement	US\$40.09 million	US\$28.12 million	US\$18.7 million
Share of Disbursement	46%	32%	21.5%
Weighted value of the outcome rating	1.38	1.3	0.86
Final Outcome rating	MS (1.38 + 1.3 + 0.852 = 3.53)		
Note: Highly Unsatisfactory (1); Unsatisfactory (2); Moderately Unsatisfactory (3); Moderately Satisfactory (4); Satisfactory (5); Highly Satisfactory (6)			

Based on the split rating above, the final weighted outcome rating is Moderately Satisfactory.

a. Outcome Rating
Moderately Satisfactory

7. Risk to Development Outcome

According to the ICR (paragraph 84) the project's overall risk to the development outcome was substantial. The sustainability of the objective related to the Corumana Dam is dependent on completion of remaining works, implementing dam safety measures, dam impoundment and commissioning, as well as pending RAP and LRP activities. The treatment and distribution of water from the dam to households in Greater Maputo Metropolitan Area is also dependent on the completion of the Greater Maputo Water Supply Expansion Project (GMWSEP). The Bank sought to mitigate the risks of closing the project with remaining activities by having the Emergency Resilient Recovery Project and GMWSEP finance the Panel of Experts, the supervising engineering firm, and the Project Administration and Management Team.

The following risks were discussed by the ICR:

1. The risk stemming from financial sustainability. The Corumana Dam and Macarretane Barrage are owned by the government and operated by the Incomáti and Limpopo watershed management units, respectively, within ARA-Sul. ARA-Sul receives 44% of its expenses through the State Budget, while O&M expenses are covered through revenue generated by its activities. According to the ICR (paragraph 85) "ARA-Sul does not have an updated business plan that reflects and communicates the objectives, resources



and management strategies for business development, and that integrates the emerging challenges of operating the investments made." While revenues are expected to increase from the new functionality of the Corumana Dam and the broader Greater Maputo water supply expansion program will increase revenues, ARA-Sul needs to improve its commercial focus by ensuring periodic tariffs adjustments with the state regulator, improving billing, improving collections and improving other sources of revenue. ARA-Sul also should have a liquidity plan that demonstrates that it will achieve a positive cash balance in the future and that the State's contribution to the operating expense will be reduced over time.

2. The risk related to the environment. Mozambique is vulnerable to the threats posed by climate change. Recurrent cycles of severe drought and torrential rains and floods will directly affect dam operations and yield to the GMMA. Regional climate change scenarios in the Sabié River catchment indicate higher mean annual precipitation in the immediate future. However, higher temperatures could also increase evaporation rates of the reservoir as well as an increased demand for downstream irrigation. The reservoir operation will require the balancing of flood control with the objective of maximizing yield. Water abstraction in South Africa from the Incomáti River also affects flows into the reservoir and available yield to the GMMA. The project contributed to updating of the Interim IncoMaputo Agreement, and to the the development of the National Strategic Action Plan to Monitor Compliance with International Shared Watercourses Agreements. The latter recommended strengthening the Department of International Rivers from three senior staff to 15 professionals to more effectively manage the country's nine transboundary rivers and to ensure the GoM can represent the country's interests on shared basins at the SADC level. The GoM has signaled its commitment to this priority as negotiations with South Africa are underway to establish the Joint Commission for the Incomáti and Maputo Rivers.

3. The risk related to funding availability. Three river basin development plans were completed in 2019 and their implementation is at an early phase. Despite that the river basin development plans were prepared in close collaboration by the local basin authorities, the on-going internal financial crisis resulted in relatively few investments in large hydraulic infrastructure. More investments have been directed to small excavated reservoirs scattered throughout the country.

This Review highlights the following additional risk:

The risk related to challenging security conditions in northern Mozambique. In recent years northern Mozambique has been targeted by terrorist attacks. These attacks resulted in population migration and displacement. If such conditions extend to further areas of the country, the sustainability of the development outcome of the project will be in doubt.

8. Assessment of Bank Performance

a. Quality-at-Entry

The Government of Mozambique (GoM) viewed the NWRDP as part of the first phase of a broader multi-donor program to carry out the country's water sector policies, strategy, regulations, and investments. The main objective of the project was the completion of the Corumana Dam to augment bulk water supply, while the downstream intake, water treatment, and conveyance system would be supported by



the Bank-funded Greater Maputo Water Supply Expansion Project (GMWSEP). Objectives were in line with the Government priorities for the water sector and with the Bank's regional and country strategies (see section 3 for more details).

Project preparation benefited from solid analytic underpinnings including a tripartite study by Mozambique, South Africa and Swaziland on the "Augmentation of Water Supply to the City of Maputo and its Metropolitan Area" in October 2009 and the 2011 "Master Plan for the Greater Maputo Water Supply System". These studies helped identify water sources and priority investments to improve bulk water supply for the GMMA (ICR, paragraph 52). Design benefited from the Bank's experience in the country and lessons learned from the engagement in the water sector. The project preparation process drew on lessons derived from the implementation of the Bank's 2003 Water Resources Sector Strategy (WRSS) as well as the recommendations of the IEG report on water and development (ICR, paragraph 53). Notable lessons included "the importance of properly aligning the implementation of environmental and social measures during the early stages in design of complex water resources development projects, the need to consider interventions within an integrated basin-wide management framework that explicitly considers the cumulative impacts of all developments, not only of the specific project (ICR, paragraph 53)." Lessons from the Bank-financed National Water Development Program project included: the need for a comprehensive M&E system, the need to ensure strategic TA in place early to strengthen management and leadership during the initial phase, and the need to strengthen contract management.

Despite the preparatory work, "detailed designs were not done until after project approval, which severely affected implementation timeline, project management, and M&E (ICR, paragraph 54)." Also, implementation arrangements did not account for bureaucratic constraints and lacked clear incentives (ICR, paragraph 79). Implementation suffered from the failure to launch the strategic TA program at entry, which was expected to improve implementation capacity. A notable design shortcoming was "the decision to defer the detailed technical designs of the Corumana Dam to implementation (ICR, paragraph 79)." This had a cascading effect that resulted in severe implementation delays (ICR, paragraph 79).

Identification of risks and mitigation measures suffered from shortcomings (ICR, paragraph 55). Overall risk was rated medium despite that the project involved a complex set of activities the including large works contracts, ESS issues, and institutional capacity. While the risk related to fiduciary capacity was assessed as medium, procurement was challenging and contributed to implementation delays.

M&E suffered from design weaknesses, namely, the results framework included intermediate and outcome indicators that could not be effectively used to monitor and evaluate achievement of the objectives (see section 9 for details).

Based on the above-mentioned assessment, Quality at Entry is rated Moderately Unsatisfactory. This rating reflected significant shortcomings related to design, implementation readiness, risk assessment and M&E design.

Quality-at-Entry Rating
Moderately Unsatisfactory



b. Quality of supervision

The Bank conducted 15 formal implementation support missions over an implementation period of 8 years. According to the ICR (paragraph 80) "there were frequent technical discussions and the task team provided just-in-time support, problem solved, visited project sites, implemented trainings, and participated in consultations." Most team members were field based, which facilitated a swift response to the 2013 floods and proved useful during the last two years of implementation when intense supervision was needed. The Bank team also provided technical and administrative support to augment the constrained implementation capacity.

The ICR (paragraph 81) reported that there were "actions, decisions, and processes that adversely affected implementation." These included: taking six years to process the main contracts and begin works on the Corumana Dam (almost the entire time-frame of the project); a protracted process of finalizing and approving the updated ESIA and RAP which resulted in delays and unfinished activities by project completion; the cancellation of US\$5.00 million for the 2019 cyclone response compounded the already constrained project budget; closing of the project in June 2020 as scheduled despite COVID-19 restrictions and pending works and safeguards rather than having another extension; and the Bank team could have made better use of the restructurings to ensure alignment between project scope and the outcome indicators to enable a more accurate assessment of project outcomes. While these were notable shortcomings, they were not fully under the Bank's control.

Quality of Supervision is rated Moderately Satisfactory.

Overall Bank Performance rating is rated Moderately Satisfactory.

Quality of Supervision Rating

Moderately Satisfactory

Overall Bank Performance Rating

Moderately Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

The PAD did not include a Theory of Change as it was not mandated at appraisal. Nonetheless, the ICR (page 8, figure 1) included one which reflected the relation between the planned project activities, its outputs, outcomes and long-term impacts. According to the ICR (paragraph 4) "the NWRDP's flagship activity was the completion of the Corumana Dam to augment bulk water supply."

The achievement of the PDO was to be assessed through three PDO level results indicators: 1. Percent of the river basins covered by water resources management plans (target: 19 out of 27 basins, baseline:5), 2. Percent of hydro-climatic stations operational and reporting (target: 300 out of 650, baseline: 150), 3. Incremental reservoir yield available from Corumana Dam for GMMA (target: 16.8 million cubic meter per year (Mm³/year), no baseline). While the three outcome-level indicators remained the same, target values



were adjusted for two of them. The target value for “river basins covered with management plans” decreased from 19 to 12 to better align with the project budget, while the target value for “incremental reservoir yield available from Corumana Dam for GMMA” was reduced from 16.8 Mm³/year to 11.6 Mm³/year, to reflect temporary restrictions on the dam’s FSL until an auxiliary spillway was built.

The first two indicators were pitched at the intermediate outcome/output level rather than the outcome level. Further, this Review is in agreement with the ICR (paragraph 67) that outcome indicators 1 and 2 were designed to measure results that could not be fully attributable to the project, since the achievement of their respective targets involved parallel financing through other stand-alone projects. While for the third indicator the definition and the methodology to calculate incremental yield in relation to the storage capacity were both not clear in the design.

The results framework originally included 12 intermediate outcome indicators that were later increased to 17 during implementation. These indicators were measurable and directly related to the financed activities. However, some intermediate indicators were program-oriented including: the national water storage capacity and the upgrading of hydro-met stations in the Limpopo, as these aimed to measure broader program performance with targets that relied on other projects.

Overall, M&E design was poor and lacked the depth and comprehensiveness to capture the achievements of broad targets such as “strengthening water resources management and development.” Such a broad objective could have benefited from multiple indicators to cover various aspects and facilitate assessing and evaluating the project achievements. Also, the indicator related to the Corumana dam “incremental yield” lacked a clear definition.

b. M&E Implementation

Implementation was overseen by the National Directorate of Water (DNA). According to the ICR (paragraph 71) M&E implementation was mixed. Semi-annual reports were submitted to the Bank reflecting progress on project-specific indicators, and the MTR was conducted and the GoM’s completion report was undertaken. However, “the lack of proactivity on the part of the Bank to ensure consistency between the M&E framework and the project scope severely hampered the final evaluation of the project’s objectives (ICR, paragraph 71).”

Restructurings and changes to the M&E framework. One intermediate indicator “Improved cost recovery of ARAs” was dropped because it was determined to be unachievable within the project scope as “it required substantially more support including legal and institutional reform, investments and capacity building for water licensing and monitoring systems (ICR, Annex 6).” Also, six new intermediate indicators were added to monitor outputs related to the AF which focused on rehabilitation of dykes and levees and the Macarretane Barrage on the Limpopo River. These changes were necessary in light of new activities under the AF. However, the intermediate indicator relating to the hydro-meteorological stations should have been dropped, but this did not happen.

c. M&E Utilization

According to the ICR (paragraph 72) the “M&E framework helped inform project management and decision-making.” Supervision discussed the achievement of project indicators and any bottlenecks



impending the achievement of the desired results. Overall, the ICR provided limited evidence on utilization.

On balance, M&E Quality is rated as Modest. This rating reflects a poor design that lacked the depth and comprehensiveness to assess the stated objectives, in addition to mixed implementation and limited utilization. This Review is in agreement with the ICR's conclusion that "the lack of proactivity on the Bank's side to ensure congruence between project scope and outcome indicators represent significant shortcomings in the system's design and implementation (ICR, paragraph 73)." These shortcomings undermined the assessment of the final outcome of the project.

M&E Quality Rating

Modest

10. Other Issues

a. Safeguards

The project was screened and classified Category A project requiring a full assessment because of the concerns that completion of the Corumana Dam could result in inundation of areas upstream of the reservoir in the Kruger National Park, an internationally acclaimed wilderness area with formal protection status in South Africa. Consequently, the following safeguard policies were triggered: OP/BP 4.01 Environmental Assessment, OP/BP 4.04 Natural Habitats, OP/BP 4.11 Physical Cultural Resources, OP/BP 4.37 Safety of Dams, OP/BP 4.12 Involuntary Resettlement, and OP/BP 7.50 International Waterways.

An Environmental Management Plan (EMP) and an Environmental and Social Impact Assessment (ESIA) were prepared to ensure that (i) any negative environmental and social impacts as a result of the completion of the Corumana Dam are avoided or mitigated to an acceptable degree and (ii) any positive environmental impacts are enhanced where feasible. Also, a Social Impact Assessment (SIA) and a Resettlement Action Plan (RAP) were prepared for the completion of the Corumana Dam. The ESIA and the SIA were disclosed in-country and through the InfoShop, both on April 11, while the EMP and the RAP were disclosed on April 28 and May 11, respectively.

There were significant delays related to updating the environmental and social impact assessments (ESIA) and the RAP, which took four years to complete and were finally approved by GoM in April 2018, seven and a half years after project effectiveness. The ICR (paragraph 66) noted that it took an additional six months for the Bank to approve the RAP after GoM's approval in April 2018. These delays made the implementation of the ESIA and RAP related activities challenging and eventually resulted in a number of activities that were left pending at project closure (ICR, paragraph 60).

Compliance with Environmental Safeguards. The project design included a standalone component to ensure compliance with Bank safeguards requirements as well as applicable national regulations. The ESIA and the RAP were updated to reflect "more demanding GoM regulations on resettlement and economic impact assessments (ICR, paragraph 75)." However, this process took four years. According to the ICR (paragraph 76) "the construction works caused limited and largely temporary adverse environmental impacts, with deviations from the ESMP, mainly concerning housekeeping and waste management, and initially poor OHS performance, which was corrected in later months through penalties, training, stringent



monitoring and ongoing corrective action." Major construction ended and all rehabilitation around the works was completed by the time of the ICR. A final environmental audit was expected to be undertaken towards the end of the construction liability period (ICR, Annex 7).

Compliance with Social Safeguards. As mentioned above, it took four years to update the RAP. According to the ICR (paragraph 76) "the project financed the construction of high quality resettlement housing, including access roads, integrated water system, and electricity, as well as the resettlement of PAPs." However, the project closed with pending safeguards measures, including some compensation and allowances, several LRP activities, and social and environmental audits. The ICR (paragraph 76) explained the afore-mentioned pending activities were on-going post completion and were to be financed by GoM with support from the Panel of Experts and the Bank. However, it was not clear the level of commitment on the government side to fully finance and complete the pending activities.

The ICR did not include an explicit statement of compliance, but stated that "the project closed with overall environmental and social safeguards performance consistently rated MS during much of the project implementation phase and at project closure."

b. Fiduciary Compliance

Financial Management (FM). According to the ICR (paragraph 77) "FM and audit throughout the project were consistently compliant with the Bank and the country's Administrative Tribunal requirements." The project had an adequate accounting system to record project funds, expenditures, and resources following the procedures outlined in the Project Implementation Manual. Quarterly interim financial reports and annual financial statements were of acceptable quality. Reviews of interim financial and audit reports were unqualified. The Bank provided FM support and supervision on a timely basis, and training and capacity exchanges were consistently carried-out to sustain optimal FM practices. The ICR (paragraph 77) noted that "FM performance was consistently rated Satisfactory in Bank ISRs." However, the ICR did not comment on the status of the final audit reports.

Procurement. While there were no instances of non-compliance with Bank policies or Mozambican laws, procurement was challenging throughout implementation. Specifically, procurement processing was a bottleneck with contracts related to the Corumana Dam (a combined 70% of the original project financing), suffering protracted delays (ICR, paragraph 59). Delays related to the Corumana dam contracts had a cascading effect on non-dam related contracts and sequencing of related activities. Also, the contract for the ESIA and RAP updates took two and a half years to process and was signed in mid-2014. Procurement activities suffered from the lack of technical rigor and poor quality of procurement packages, which led to extended exchanges between the Bank and GoM. Procurement performance improved after processing the dam contract and benefited from hiring an additional procurement officer in the second half of the project.

c. Unintended impacts (Positive or Negative)

Not discussed by the ICR.



d. Other

Not discussed by the ICR.

11. Ratings

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

12. Lessons

The ICR included six lessons, the following two are emphasized with some adaptation of language:

1. To ensure successful implementation of activities, the Bank and the Borrower need to include in the project design adequate implementation support measures that take into account any capacity constraints. While the realities on the ground did not allow the implementing arrangements to materialize as envisioned, the Bank and Borrower could have ensured adequate staffing in light of the National Directorate for Water Resources Management growing portfolio. The Borrower must also ensure key positions are filled with capable staff. While a program of technical assistance could potentially bolster implementation capacity, the provider should ideally be familiar with country and sector context in order to ensure advice is readily applied.

2. To close a project with pending activities, a firm and tangible government commitment is needed to finance and complete each of the remaining activities. This is particularly important for sensitive activities with potentially high risks, including reputational risks to the Bank, such as resettlement compensation and dam safety. Short of project extension, the Bank could devise a special instrument/vehicle to continue providing minimal financing mainly for soft activities that would enable the Bank to support clients in fulfilling its obligations and mitigating risks to both the client and the Bank.

The following additional lesson is emphasized by IEG:

To ensure successful and timely implementation of projects that involve dams and related works, dam design and hydrological studies need to be ready at the onset of implementation. The project experience demonstrated that deferring the dam related designs to a later time during implementation not only caused significant delays, but also resulted in an unanticipated change in



design. Dam design and hydrological studies need be conducted by reputable sources to ensure quality and avoid costly changes during implementation.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

Quality of Evidence. The ICR acknowledged that M&E design and implementation had shortcomings. The ICR used the project data to the extent possible to assess the project outcomes. However, the limited congruence between project scope and outcome indicators represented significant shortcomings in the system's design and implementation.

Quality of Analysis. The ICR provided clear linking to the extent possible between evidence and findings and used the evidence base to serve the arguments under the different sections, in particular the discussion on outcomes. However, the link between storage capacity and incremental dam yield needed to be clarified. Overall, M&E design weaknesses hindered a comprehensive analysis of the project outcomes.

Lessons. Lessons reflected the project experience and were based on evidence and analysis.

Results Orientation. The ICR included a comprehensive discussion on the achievement of the three PDOs. The ICR also provided a well balanced discussion between reporting on the achievement of outcomes in relation to the indicators and what the project actually achieved on the ground.

Internal Consistency. Various parts of the ICR were internally consistent and logically linked and integrated.

Consistency with guidelines. The ICR successfully used the available data to justify most of the assigned ratings. Discussion of outcomes was adequate. However, the efficiency analysis could have benefited from further evidence to justify the assigned rating.

Conciseness. The ICR provided comprehensive coverage of the implementation experience and candidly reported on shortcomings. The reporting on safeguards was detailed, but did not include an explicit statement on compliance, and the ICR did not report on the status of the final audit reports for the project. Also, the sections on M&E implementation and utilization could have benefited from more details, and the outputs in Annex 1 lacked targets. Also, the output regarding "two new irrigation canals in the Limpopo Valley" was not discussed beyond Annex 1.

Overall, the Quality of the ICR is rated Substantial despite some minor shortcomings.

a. Quality of ICR Rating Substantial

