Report Number: ICRR0024728

1. Project Data

Project ID P147250	**Project Name** GY Flood Risk Management
Country Guyana	**Practice Area(Lead)** Urban, Resilience and Land

L/C/TF Number(s)	**Closing Date (Original)**	**Total Project Cost (USD)**
IDA-54740,IDA-67860	31-Jan-2019	33,170,411.52
Bank Approval Date	**Closing Date (Actual)**	
04-Jun-2014	31-Dec-2024	

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	37,890,000.00	0.00
Revised Commitment	35,307,737.99	0.00
Actual	33,170,411.52	0.00

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2. Project Objectives and Components

a. Objectives

The Project Development Objective in the PAD (p.5) is to reduce the risk of flooding in the low-lying areas of the East Demerara. The Financing Agreement for the loan (p. 4) has the same objectives. This review has assessed the PDO achievement in terms of the following objective:

i. To reduce the risk of flooding in the low-lying areas of the East Demerara.

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?
No

d. Components

Component 1: Priority Works for Flood Risk Reduction. (US$10.3 million at appraisal, US$30.5 million at additional financing, US$31.14 million actual) The additional financing (AF) did not add new activities but allowed the project to finance more of the same activities. Under this component, the project financed the upgrading of critical sections of the East Demerara Water Conservancy (EDWC) dams (4 km under the original project and almost an additional 8 km with the AF) and the acquisition of 21 pieces of heavy equipment, including excavators, rollers, and barges, to support dam rehabilitation and maintenance. It financed contracted works to rehabilitate and strengthen priority portions of the northeast dam, including embankment upgrading, improvements to irrigation regulators, and installation of surveillance instruments. The project also financed priority drainage investments in several East Coast Demerara areas, including activities such as improving pumping capacity (3 pumping stations under the original project and 2 more with the AF), constructing and upgrading culverts, widening and rehabilitating drainage channels, and separating urban and agricultural drainage systems, with designs and geotechnical analyses completed during implementation. Finally, the component financed the procurement of construction supervision and quality-assurance consultants to oversee all dam and drainage investments.

Component 2: Institutional Strengthening for Flood Risk Reduction (US$0.4 million at appraisal, US$3.5 million at additional financing, US$0.23 million actual) This component financed technical assistance and systems development to strengthen dam safety and flood-risk management. The original project supported the preparation and adoption of the Construction Supervision and Quality Assurance Plan (CSQAP); refinement of the Operations, Maintenance, and Surveillance Plan (OMSP) and manual; and training for dam inspection, maintenance, environmental, and safety standards. It financed the procurement and installation of instrumentation to monitor dam behavior, expand hydrometeorological data collection, and support watershed-level surveillance. The project also financed the development of an Emergency Preparedness Plan (EPP), including inundation mapping, emergency procedures, and communication protocols. Additionally, the component financed hydrologic and hydraulic modeling of the EDWC and coastal drainage systems, IT support for data management, and a package of communication activities including public meetings, coordination sessions with partners, and production of information materials. The training in flood risk modeling was not pursued at the client's request. The ICR interview (December 4, 2025) noted that the Georgetown Flood Master Plan technical assistance and the World Bank-supported Coastal Adaptation and Resilience (CARes) Project (P503393) provided additional technical assistance and capacity-building support to the government in these areas.

Component 3: Project Management and Implementation Support (US$1.2 million at appraisal, US$3.9 million at additional financing, US$1.8 million actual)**.** This component financed comprehensive support to the Agriculture Sector Development Unit (ASDU) to execute project management, coordination, monitoring, and reporting functions. It funded the hiring of specialized staff and consultants; the collection of socio-economic data for monitoring and evaluation; and the preparation of engineering designs, tender

documents, and contracts. It also financed consultant services for works supervision and for preparing technical and financial reports, along with mid-term and ex-post evaluations and project audits. In addition, the component supported the contracting of environmental and social safeguard specialists to prepare and oversee safeguards instruments and mitigation measures, as well as training for ASDU staff in procurement, safeguards, M&E, and financial management. Operating costs, computers, and office equipment required for the ASDU to function effectively as the Project Implementation Unit (PIU) were also financed.

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

Cost: The estimated total project cost at appraisal was US$11.89 million. The project was restructured with additional financing and expanded for a total cost of US$37.89 million. The actual total cost was US$33.17 million (ICR, p. 33).

Financing: At appraisal, the IDA financing was estimated at US$11.89 million. The additional financing added US$26 million, bringing the total commitment to US$37.89 million. The amount disbursed at closing was US$33.17 million, which was 87 percent of the revised loan amount (ICR, p. 33). IEG inquired with the Task Team on the rationale for the undispersed amount, but they did not provide clarification.

Borrower Contribution: There was no Borrower contribution.

Dates: The Project was approved on June 4, 2014, and became effective on November 25, 2014. The project closing date at appraisal was January 31, 2019, but the actual closing date was extended by 5 years and 11 months until December 31, 2024, for a total implementation period of 10 years and 7 months. The Mid-Term Review (MTR) was conducted in March 2017. The project had three restructurings and additional financing that included the following:

- On December 27, 2018, a level 2 restructuring extended the project closing date by 12 months**,** from January 30, 2019, to January 30, 2020.
- On December 5, 2019, a second level 2 restructuring further extended the closing date by 12 months to July 30, 2020.
- On June 24, 2020, a third level 2 restructuring extended the project closing date by 6 months to January 30, 2021.
- On November 19, 2020, additional financing was approved, extending the project closing date by three years and eleven months to December 31, 2024. The additional financing added US$26 million, expanded the scope of the project, increased targets, and added additional indicators in the results framework.

A split evaluation was not conducted as no material changes to the PDO were made and no targets were reduced.

3. Relevance of Objectives

Rationale

Guyana is a small country of about 831,000 people (2024), which graduated in 2023/2024 to high-income status due to its oil reserves and revenues from oil production. The country's GDP per capita stands at US$29,833 in 2024 compared to US$4,960 in 2018. However, as of 2019, it had 48.3 percent of the population living below the US$5.50 a day poverty line (Country Partnership Framework, FY23-26). The Systematic Country Diagnostic (SCD) from 2020 identified mitigating flooding risk along the coastline, where the population and economic activity is concentrated, as a priority intervention to ensure macroeconomic stability (SCD, p. 9). In 2005 and 2006, Guyana experienced catastrophic flooding in the project area and, in the aftermath, made progress to strengthen its flood control systems; however, the system is complex and extensive, requiring long-term investments. The Country Partnership Framework (CPF) at project close continued to prioritize flood risk mitigation through its High-Level Outcome (HLO) 3: Enhanced Climate and Environmental Resilience, and specifically Objective 6: Strengthen Flood Resilience and Climate Change Adaptation. Objective 6's core and supplemental indicators are directly tied to the PDO outcome and intermediate indicators of the project. (CPF, p. 34-35)

The PDO is aligned with the government's national priorities on disaster risk reduction and climate resilience under its Low Carbon Development Strategy (LCDS) 2030, Guyana's Nationally Determined Contribution (NDC), and its Climate Resilience Strategy and Adaptation Plan, all of which emphasize protecting against the risks of climate change and sea level rise. (ICR, p. 4)

The project was informed by a World Bank and Global Environment Facility (GEF) – Special Climate Change Fund grant of US$3.8 million, which assessed the hydrological behavior of the East Demerara Water Conservancy (EDWC) and East Coast Demerara drainage systems and the technical stability of the EDWC dams to identify investment options. The project was also informed by the World Bank's regional initiatives in disaster risk management. (PAD, p. 7)

The PDO of reducing the risk of flooding in the low-lying areas of the East Demerara was appropriately identified at the outcome level. The PDOs were also appropriate for the country context, reflecting the needs of the government, and were aligned with the World Bank's CPF. The rating for relevance of the PDOs is High.

Rating

High

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

To reduce the risk of flooding in the low-lying areas of the East Demerara.

Rationale

The theory of change (ToC) in the Implementation Completion Report (ICR, p. 2) identified the outcome to reduce the risk of flooding in the low-lying areas of the East Demerara.

The inputs were financing two groups of activities - infrastructure and institutional strengthening. The group of infrastructure activities included: (i) technical designs and upgrading/rehabilitation of critical sections of the EDWC dams and the acquisition of heavy equipment to support dam rehabilitation and maintenance; (ii) installation of surveillance instruments and irrigation regulators; (iii) improved pumping capacity, constructing and upgrading culverts, widening and rehabilitating drainage channels, and separating urban and agricultural drainage systems; and (iv) construction supervision and quality-assurance consultants to oversee all dam works and drainage investments. The group of institutional strengthening activities included: (i) technical assistance and systems development to strengthen dam safety and flood-risk management; (ii) development of CSQAP; (iii) refinement of the OMS manual and plan; (iv) training for dam inspection, maintenance, environmental, and safety standards; (v) installation of instrumentation to monitor dam behavior, expand hydrometeorological data collection, and support watershed-level surveillance; (vi) Emergency Preparedness Plan, including inundation mapping, emergency procedures, and communication protocols; (vii) hydrologic and hydraulic modeling of the EDWC and coastal drainage systems, specialized training in modeling and remote sensing, IT support for data management, and (viii) a package of communication activities including public meetings, coordination sessions with partners, and production of information materials. (PAD, p. 21-24)

The expected outputs for infrastructure were:(i) studies and designs completed; (ii) infrastructure works for dam rehabilitation and drainage completed; (iii) installation of dam, surveillance and irrigation equipment installed, and (iv) heavy equipment for dam operation and maintenance procured. For institutional strengthening, the outputs were:(v) technical assistance and trainings delivered on dam safety and flood risk management; (vi) plans, manuals, and mapping developed; (vii) computer equipment and software installed, and (viii) communication activities and community engagement activities conducted.

The expected outcomes for infrastructure were increased integrity of dams, increased drainage capacity, and improved performance of flood control infrastructure. For institutional strengthening the expected outcomes were enhanced capacity for dam operation and maintenance, flooding preparedness and response, and community understanding of flood risks.

These outcomes, in turn, are expected to lead to the PDO of reduced flood risk in low-lying areas of the East Demerara, contributing to higher-level outcomes of improved climate resilience, economic productivity, and environmental sustainability.

The ToC's activities, outputs, and outcomes were adequate to make the linkage with the PDO outcome target. The ToC had the following critical assumptions that were clearly articulated: (i) continued government support, (ii) no extreme catastrophic event beyond project design parameters, (iii) weather conditions permit timely work, (iv) communities support project interventions, (v) timely procurement, and (vi) quality consultants and contractors and materials available. The project's results framework adequately tracked the indicators to measure the ToC.

At the additional financing, new indicators were added, and targets were expanded for the original quantitative indicators as noted below. The output level achievements under this objective are categorized by infrastructure and institutional strengthening and included the following:

Infrastructure:

- 19 cubic meters per second drainage capacity, **achieving** the expanded target of 14 cubic meters per second. This was achieved through the installation of three pumping stations that added a total capacity of 8 cubic meters per second of drainage capacity. A sluice gate at Ogle was rehabilitated and two mobile pumps provided an additional 2.4 cubic meters per second, and the construction of high-capacity pump at Liliendaal added another 8.6 cubic meters per second for a total of 19 cubic meters per second. (ICR. p. 7)
- 219,816 water users provided with improved irrigation and drainage services, **exceeding** the expanded target of 97,638 water users. (ICR, p. 17) The target was significantly exceeded because of the inclusion of Liliendaal and Ogle, which benefited the Georgetown population. The additional financing had planned to rehabilitate the pumping stations; however, during implementation, it was deemed feasible to increase the capacity of the pumping stations and add mobile pumping stations, allowing the Georgetown population to benefit, which was not anticipated in the additional financing. The targets were not updated through any restructuring after the additional financing. (ICR interview, December 4, 2025)
- 11.03 km of dam upgraded, **almost achieving** the expanded target of 12.9 km. The ICR reported that the reinforced sections of the dam, including the most vulnerable portions of the 7.03 kilometers of the Northeast dam, have been widened sixfold, enabling the protection of approximately 32,000 hectares despite the original target of 12.9 km not being met. The ICR interview noted that the strategic selection of dam segments to rehabilitate allowed the project to achieve the outcome area protected with less length of dam upgrade. The ICR noted that these achievements do not include additional works undertaken by NDIA in parallel, where they are using the CSQAP that was developed under the project, along with specialized equipment. (ICR, p. 6)

- Gender considerations are partially included in infrastructure design, **partially achieving** the original target of 'yes'. The ICR noted that the project promoted inclusive stakeholder consultations and an accessible grievance redress mechanism; however, it did not elaborate in any detail on interventions and results from those interventions. The ICR noted that a gender analysis found that 13 percent of farm holders in the project area are women, but no other information was provided.
- Priority drainage Interventions at Liliendaal and Ogle basins have been determined, **achieving** the new target of 'yes'. This indicator was added at the additional financing phase. The ICR reported that hydrological modelling of drainage interventions and detailed engineering design were carried out for the Liliendaal and Ogle catchment areas and completed in December 2022. Liliendaal and Ogle infrastructure investments were completed and are now operational, benefiting the Georgetown population. (ICR, p. 18) The ICR included a video that documented the new pumping stations and the impacts, as perceived and reported by one resident on reduced flooding.

Institutional Strengthening:

- 7 staff at NDIA are trained in climate-resilient flood modeling, **not achieving** the new target of 20 people**.** This indicator was added at the additional financing phase. The provision of training was affected by the budget shortfall under the original project and further affected by the COVID-19 pandemic. (ICR, p. 18) The ICR interview with the Task Team (December 4, 2025) noted that the team obtained a trust fund grant (US$545,845) in 2019 and closed at the end of 2024 (Resilient, Green, and Inclusive Flood Investment Baseline for Georgetown-TF0B3454) that incorporated the training and capacity activities that were envisioned in the project. In addition, the Task Team incorporated institutional capacity building activities into the follow-on Coastal Adaptation and Resilience Project - CARes (P503393).

- New methodology for dam rehabilitation was applied**, achieving** the new target of 'yes'. This indicator was added at the additional financing phase. The project adopted a new and more resilient technique for rehabilitating the dam, which adds a compaction step on the top of the dam with a 10-ton sheep roller, in addition to continuous soil sampling, significantly increasing the overall quality of the construction. (ICR, p. 18) This methodology is now being applied by the government with its own financing through the REDD+ Coastal Adaptation and Resilience Project - CARes (P503393) with World Bank support.
- Operational procedures and surveillance systems for the EDWC dams were adopted, **achieving** the original target of 'yes'. The Instrumentation Plan for Surveillance and Forecasting and the Operations, Maintenance, and Surveillance Plan (OSMP) were adopted and used to guide and supervise works under the project. (ICR, p. 18) The ICR noted that the OMSP institutionalized NDIA's maintenance and operational routines, enhancing system efficiency and accountability (ICR, p. 8) The operational procedures and OSMP have been incorporated into the CARes Project, which is financed by government resources. (ICR interview, December 4, 2025)
- Expanded meteorological, hydrological monitoring network was installed and active, **achieving** the original target of 'yes'. The meteorological and hydrological monitoring network was installed and activated in 2017. (ICR, p. 18) The ICR reports that the Instrumentation and Monitoring Plan enabled near real-time hydrometeorological data collection, improving NDIA's ability to monitor system performance and respond proactively to rainfall variability. (ICR, p. 8)
- Dam safety measures, including procedures for emergency preparedness in case of dam breach, were adopted, **achieving** the original target of 'yes'. The Construction Supervision and Quality Supervision Plan (CSQAP) was completed and used to guide and supervise the construction of the Northeastern dam of the EDWC under the project. The CSQAP was further updated by the Agriculture Sector Development Unit (ASDU) of the Ministry of Agriculture for the EDWC dam works based on the experiences from upgrading of dam sections under this project and incorporated the use of the new equipment provided under the project, such as amphibious excavators. (ICR, p. 18) The ICR interview indicated that the EPP was further expanded under the project to include a Response Plan. The EPP is now called Emergency Preparedness and Response Plan (EPRP), which is now proposed to be used nationwide under the Cat DDO that is currently being prepared by the Bank. (ICR interview, December 4, 2025)
- 4 key consultations for citizen feedback were conducted during design and implementation of key drainage infrastructure, **achieving** the new target of 3. This indicator was added at the additional financing phase. The ICR interview noted that the consultations were carried out to raise public awareness, disclose project activities, and gather community input. These consultations confirmed broad support for the project, with minor complaints recorded. The consultations identified potential traffic disruption from road closures, which led to the adoption of trenchless technology for tunnelling under the road to install culverts, to avoid traffic disruption. Consultations also increased women's participation in line with the gender analysis, although the highly technical nature of the infrastructure limited the influence of these inputs on core design. (ICR Interview, December 4, 2025)

OUTCOMES

- 32,000 hectares with improved protection against breach of EDWC dams, **achieving** the expanded target of 32,000 hectares. This result was achieved by upgrading 11.03 km of the EDWC dams. The ICR interview noted that while the target of dam rehabilitation was not achieved, the selectivity of dam rehabilitation locations allowed the project to achieve the area of protected hectares with less lineal

km of dam rehabilitation. The protection of this area is based on the rehabilitated dam, but also the operation and maintenance of the infrastructure as noted in the institutional indicators above.

- 13,379 hectares with new/improved irrigation or drainage services (Original target was 13,379 hectares) **(achieved).** This was achieved through the installation of three pumping stations that added a total capacity of 8 cubic meters per second of drainage capacity. A sluice gate at Ogle was rehabilitated and two mobile pumps provided an additional 2.4 cubic meters per second, and the construction of high-capacity pump at Liliendaal added another 8.6 cubic meters per second for a total of 19 cubic meters per second. (ICR. p. 7) The area with improved drainage is based on the rehabilitated pumping stations, and increased capacity of drainage infrastructure, but also on the operation and maintenance of the infrastructure as noted in the institutional indicators above.
- 315,658 people are benefiting from reduced flood risk/protected from flooding, **exceeding** the expanded target of 150,000 people. This indicator refers to the number of people who directly derive benefits from project interventions, and includes the population reported in the census for Region 4, East Coast Demerara. The investments in Liliendaal and Ogle under the additional financing benefited the Georgetown population (2025 estimate of 119,920), because the two drainage systems have interconnections with other parts of the Georgetown drainage system.

The following outcome was not an indicator in the results framework, but was reported in the ICR:

- Before the project, the failure probability [of the dam] was estimated at 1 in 1,000 (0.001). After implementation, the probability has been reduced to 1 in 10,000 (0.0001), representing a 90 percent reduction in breach risk. (ICR, p. 36)

The indicators used to monitor PDO, and the ToC were generally adequate. The project was able to achieve or exceed all of its output and outcome indicators except for three. While the project did not achieve the training indicator on flood risk modeling, the ICR interview noted that the government lowered the priority of this training during the additional financing and decided to prioritize other investments, but the trust fund resources and the ongoing CARes project continue to provide opportunities for strengthening institutional capacity in this area. Taking these factors into account, the efficacy rating for PDO is assessed as **High**.

Rating
High

OVERALL EFFICACY

Rationale
As discussed in the efficacy section above for Objective 1, the project was able to achieve or exceed its core indicators. The three indicators that were not achieved did not have a material impact on the project outcomes. Taking these factors into account, the efficacy rating for PDO is assessed as **High**.

Overall Efficacy Rating

High

5. Efficiency

Ex Ante Economic Efficiency: A cost-benefit analysis (CBA) was used to determine the economic feasibility of the project and estimate the net economic benefit corresponding to the difference of incremental economic benefits and incremental costs resulting from two scenarios: with and without the project. The Avoided Cost method was used to estimate benefits, and the evaluation was complemented with sensitivity analysis. (PAD, p. 52) The analysis was conducted separately for the drainage works and the dam rehabilitation works. The internal rate of return (IRR) of the project at appraisal for the drainage works was 12 percent, and 32 percent for the dam works. There were no net present value (NPV) calculations made at appraisal. The lifecycle of the works was assumed to be 30 years, and a discount rate of 10 percent was applied.

Ex Post Economic Efficiency: The economic analysis at project completion used the same approach for the drainage works, but adjustments were made to the assumptions, and the actual costs were used. (ICR, p. 35). The project at closing had an IRR of 18 percent for the drainage works, which was slightly higher than at appraisal. The ex-post analysis for the dam works revised the methodology because the original model was not available. The ICR noted that the internationally accepted practices in dam safety economics were applied. (ICR, p.36) The IRR for the dam works was estimated at 7.9 percent, which was higher than the 6 percent discount rate applied. The ICR reports that a range of IRRs was estimated for the dam works at the restructuring for additional financing, with the IRRs varying depending on the percentage of dam failure risk reduction. The additional financing paper estimated that a 16 percent risk reduction results in an IRR of 6 percent, while a 35 percent risk reduction results in an IRR of 16 percent. The change in discount rate from 10 to 6 percent was done at the additional financing restructuring per the 2016 World Bank discounting costs and benefits guidelines. The ICR does not provide a direct comparison of risk reductions and IRRs in the ICR for the dam works, as was done in the additional financing paper. Similar to the ex-ante analysis, there were no NPV calculations made at closing.

Operational and Administrative Efficiency: The project was approved on June 4, 2014, and became effective on November 25, 2014. The project closing date at appraisal was January 31, 2019, but the actual closing date was extended by 30 months until January 30, 2021. Additional financing was approved on November 19, 2020, extending the closing by 3 years and 11 months. The total project implementation period was 10 years and 7 months. The ICR noted various reasons for implementation delays that included weather events that slowed work, limited availability of specialized equipment, difficulties in sourcing construction materials for the dam, and procurement delays. Factors outside the control of the government and the implementing agency, such as the depreciation of the local currency against the loan currency, led to a 10 percent reduction in the project budget, and the COVID-19 pandemic and the war in Ukraine interrupted supply chains.

Conclusion. The project's ex-post IRR was slightly higher for the drainage works than that at additional financing. The IRR of 7.9 percent for the dam works is higher than the discount rate of 6 percent; however, the ICR did not provide a direct comparison of the IRRs at different risk reduction levels for the dam works, as was done at additional financing, which ranged from 6-16 percent. The project met its revised targets and spent 87 percent of the total restructured IDA commitment of US$37.89 million. However, the project experienced operational delays of two and a half years, resulting in an efficiency rating of Substantial.

Efficiency Rating

Substantial

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

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	12.00	0 ☑ Not Applicable
ICR Estimate	✓	18.00	94.00 ☐ Not Applicable

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

6. Outcome

The PDO had indicators that were able to generally measure the ToC at the output and outcome level. Progress was made against the output indicators, such as the length of dam upgraded, the capacity of drainage increased, and various qualitative indicators on plans and procedures developed, a meteorological network installed and active, and users provided with improved irrigation and drainage services. While the institutional indicators were qualitative, the ICR provided insights into how the government is utilizing the instruments developed under the project but could have expanded on changes in the behavior of government agencies responsible for flood control. The project did not carry out an endline or impact survey as discussed in the PAD, which would have allowed the project to measure perceptions of beneficiaries across the intervention areas that included farmers and the urban population. The relevance rating is High, the efficacy rating is High, and the efficiency rating is Substantial, resulting in an overall outcome rating of Highly Satisfactory.

a. Outcome Rating

Highly Satisfactory

7. Risk to Development Outcome

The risks to the development outcomes are primarily linked to:

Ownership and commitment risk: the risk that the government lacks commitment to operate and maintain the installed works is considered in low in the country's current macro-economic climate. The government has continued to advance the rehabilitation of the EDWC dams with its own resources, using specialized equipment and plans supported by the project. The government is currently implementing a follow-on project – REDD+ Coastal Adaptation and Resilience Project (P503393), which builds upon the progress made under

this project using its own resources. Moreover, the catastrophic flooding that occurred in 2005 was the impetus for this project and the government's continued commitment.

Financial risk: The country's discovery and investment in oil production have rapidly improved the country's gross domestic product per capita, allowing for increased investment in the public sector. The country's exposure to climate-related hazards puts the country at high risk of disaster, which is recognized in the government's national development plans. Protecting its increased investments and reducing the risk of flooding disasters is likely to remain a priority as the country continues to grow its economy. Increasing financial flows from its oil revenues and growing economy should enable the government to finance the operation and maintenance costs of its public investments in flood control systems.

Technical risks: The technical risks of the works failing that were financed under the project are considered low. The technical designs of the rehabilitated earthen dams followed international technical standards that were tailored to the hydrologic conditions of the country. The construction supervision and quality assurance firm hired to oversee the rehabilitation verified that the construction met the design standards.

8. Assessment of Bank Performance

a. Quality-at-Entry

The project was highly relevant to the World Bank's strategy and aligned with national priorities at appraisal. The design of the project was based on and guided by the predecessor GEF-financed project that conducted detailed engineering and modeling analysis to identify priority areas for investment in the East Demerara and establish a technical foundation for planning and managing these systems. The results framework and monitoring and evaluation arrangements were generally appropriate to track progress, and the Bank team adequately assessed the implementation arrangements for project implementation.

At appraisal, the overall implementation risk for the project was considered moderate with the key risk related to capacity constraints in the ASDU, particularly related to fiduciary responsibilities. The mitigating activities was to provide financing to hire a financial management specialist as the ASDU had established procurement capacity under the predecessor project and financial management to a less extent. (PAD, p. 10) The ICR reported that the project generally maintained adequate control during implementation with some financial management weaknesses emerging, but these were corrected in 2021.

Quality-at-Entry Rating

Satisfactory

b. Quality of supervision

The World Bank provided close technical support throughout project implementation and conducted about two missions per year for a total of 20 formal supervision missions that were documented by Aide Memoirs and Implementation Status and Results reports (ISRs) over the life of the operation. Environmental and

social aspects of the project were adequately monitored, and no major issues arose during implementation. The project struggled with procurement challenges and the Bank team took corrective action during implementation. The Bank team supported the client through a series of external shocks that included (i) the COVID-19 pandemic, (ii) supply chain issues related to the Ukraine war, and (iii) budget losses due to foreign exchange fluctuations. There were four Task Team Leaders that rotated supervision of the project during implementation providing some level of continuity given the duration of implementation. The Task Team obtained trust funds to support the client during implementation, demonstrating proactive support.

The ICR noted that the Bank team provided solution-oriented support, including facilitating key design revisions (e.g., increasing the height of the EDWC embankment to provide the additional benefit of protection from overtopping), encouraged innovations (e.g., adoption of trenchless technology), and helped the client prioritize and deliver strategic and high-impact risk reduction investments. (ICR, p. 14). The team generally updated progress on the results framework during implementation.

Quality of Supervision Rating
Satisfactory

Overall Bank Performance Rating
Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design
The PDO was clearly specified, and the supporting indicators in the results framework were generally adequate to measure the ToC with minor shortcomings. The results framework covered both infrastructure and institutional aspects. The technical studies completed under the predecessor project helped define the baselines and target values for the indicators. The PAD discussed mid-term and ex-post evaluations to assess the project's impact. Population census data from 2003 was used to estimate the number of people who would benefit from the project interventions, but as noted in the ICR this information was outdated and reflected the limitations in information when the targets were set during appraisal.(ICR, p. 12) The monitoring and evaluation function for the project was assigned to the PIU.

b. M&E Implementation
Baseline data for quantitative targets were based on the technical studies carried out under the predecessor project. The project was able to track inputs and outputs during implementation through monitoring contracts of contractors and consultants. The Bank team updated the results framework through ISRs during implementation for most indicators. Monitoring and tracking the progress of civil works was done through a third-party supervision firm to ensure quality. The ICR noted that the PIU had minor shortcomings in tracking results during implementation and did not provide a consolidated report at project close; however, the ICR team was able to triangulate results through various project documents. (ICR, p. 12). The ICR did not report that any mid-term and ex-post evaluation was conducted that would

have assessed the beneficiary perspectives on the impact of the project. The ICR documented a video that captures one resident's perspective on the project's impact with respect to reduced flooding, but there was no systematic assessment to gain perspectives of beneficiaries across intervention areas. Likewise, there was limited information around changes in institutional behaviors to manage flood risk that could have been obtained through qualitative interviews with government staff.

c. M&E Utilization

The results framework's indicators were updated during missions and were reflected in Implementation Status and Results (ISR) reports and client progress reports. While the client's progress was not always timely, they were sufficient to adequately track progress and inform decisions. The tracking of results was adequate to justify the additional financing that was approved by the Bank in 2020.

The overall rating for M&E systems is Substantial. There were minor shortcomings in tracking results during implementation.

M&E Quality Rating

Substantial

10. Other Issues

a. Safeguards

Environmental: The project was classified as Category B, triggering the following safeguard policies: Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), and Safety of Dams (OP/BP 4.37). While the EDWC dams were under 10 meters high and classified as small dams, the EDWC dams contain a large surface area and protect a significant portion of the population. An Environmental and Social Management Framework was prepared to guide the application of safeguard instruments, and site-specific Environmental Management Plans were implemented. During the project, no significant environmental impacts were documented.

Social: The project triggered Physical Cultural Resources (OP/BP 4.11) and Involuntary Resettlement (OP/BP 4.12). No involuntary resettlement occurred, and a grievance redress mechanism (GRM) was in place throughout the project to address complaints. Overall, the environmental and social safeguards ratings were generally Satisfactory throughout implementation, except early in the project when the PIU was delayed in hiring safeguards staff. This led to a temporary downgrade to Moderately Satisfactory.

b. Fiduciary Compliance

Financial Management: The project's financial management was satisfactory at closing and was generally adequate throughout implementation. The project implementation unit submitted interim financial statements and annual audit reports that were acceptable to the Bank and maintained adequate controls throughout the life of the project. (Final ISR, no. 20) FM performance was rated Satisfactory at the

beginning of the project and was downgraded to moderately satisfactory due to weak internal controls, which were rectified by 2021, and resulted in a Satisfactory rating for the last three ISRs. The Bank team received the final audited financial statements for the year 2024 on March 31, 2025, and found them to be acceptable. The Audit Office of Guyana issued a clean opinion. (ICR, p. 14). Lastly, the Annex 3 of the ICR notes that the government was validating the amount to be refunded to the World Bank. (ICR, p. 33)

Procurement: Procurement performance was rated moderately satisfactory, but the project faced significant delays due to limited familiarity of evaluation committee members with evolving Bank procurement policies, the absence of a dedicated procurement specialist at critical stages, weak evaluation reports, lengthy handling of claims by local authorities (e.g., Bid Protest Committee and NPTAB), and conflicts between local and Bank procurement thresholds. The Bank team responded by training NPTAB evaluators, holding regular follow-up meetings with NPTAB, agreeing to apply Bank procurement thresholds, and resolving one case of non-compliance through re-tendering. A post review in April 2025 found procurement generally consistent with the approved plan and transparently conducted, but identified weaknesses in documentation, alignment between the procurement plan and contracts, and updating of the STEP system, all linked to the lack of a procurement specialist for one year and contributing to cascading delays, time overruns, and cost increases. (ICR, p. 11)

c. Unintended impacts (Positive or Negative)

n/a

d. Other

n/a

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Satisfactory	Highly Satisfactory	IEG's ICR guidelines state that if the rating for Relevance is High, the Rating for Efficacy is High, and the Efficiency is Substantial, then the overall outcome is Highly Satisfactory. IEG agrees with the ICR's individual ratings, which result in a Highly Satisfactory and not Satisfactory overall outcome rating.
Bank Performance	Satisfactory	Satisfactory	
Quality of M&E	Substantial	Substantial	

Quality of ICR	---	Substantial

12. Lessons

- **The Bank's long-term engagement with a client's commitment can enhance prospects for implementation success and achievement of outcomes.** Flood control projects are complex with respect to infrastructure and institutional arrangements and can span more than one project cycle as demonstrated in this project and others in the region and globally. Guyana's catastrophic flooding of 2005 served as an impetus to be more strategic in its planning for flood control and disaster risk management. The predecessor project, supported by the Bank and funded by the GEF provided high-quality technical studies that served as the basis for the interventions in this project and the Cunha Canal Rehabilitation Project (P129555) for US$3.27 million that ran in parallel to this project. The EDWC dam has a total length of 67 km, of which this project helped address 11 km in upgrading. However, this project provided the technical and institutional inputs to support the government with its ongoing efforts with its own resources for operation and maintenance and upgrading, as documented in the ICR, as well as the underpinning for follow-on projects financed by the Bank, such as the Coastal Adaptation and Resilience (CARes) Project (P503393). While not formally a multi-phase approach, de facto, the predecessor project, this project, and the follow-on project mirror one, strategically supporting the client over a long-term engagement.
- **Sequencing interventions such as complex studies, designs, and modeling prior to making large-scale infrastructure commitments can enhance project implementation and improve long-term sustainability.** This project was based on high-quality and rigorous analytical work financed between 2007 and 2013 by the Conservancy Adaptation Project (P103549). That project included sophisticated surveys, detailed assessments of the existing dam infrastructure, and flood modeling to identify priority areas for investments. The smaller investment in that analysis allowed this project to move into implementation and focus on high priority areas while also providing inputs for a long-term investment plan that extended by this project. The ICR notes that the design and implementation of effective flood risk reduction measures depend heavily on robust technical studies, including detailed hydrological and hydraulic modeling, hazard mapping, and risk assessments. It also notes that these analyses are essential to inform the prioritization, design standards, and sequencing of structural and non-structural interventions. (ICR, p. 15)
- **Flexibility to adopt new innovations during implementation can improve project implementation and mitigate prolonged delays.** This project faced various technical challenges during implementation that were not foreseen at appraisal, creating obstacles to delivering the project on schedule. When confronted with these challenges, the PIU and the Bank team adopted innovative construction methodologies in concert with consultants and contractors to accelerate delivery. This was displayed in the construction approach to the EDWC dam as well as tunneling techniques.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR provides a comprehensive and detailed overview of the project. The narrative largely supports the ratings and is based on available evidence. The ICR is candid, concise, follows the ICR guidelines, and is aligned with the project development objective. The infrastructure improvements are well documented, but the ICR could have elaborated more on the institutional behavior changes. The Task Team provided additional information on project outputs and outcomes through the ICR interview. The ICR documented limited perspectives from beneficiaries, which could have been more extensive, given there were no beneficiary surveys at project close. The ICR included a link to a YouTube video about the drainage aspect of the project, which provided good documentation. The quality of evidence and analysis was adequate, and the lessons are relatively clear. The rating is Substantial.

a. Quality of ICR Rating

Substantial