



Report Number: ICRR0023033

1. Project Data

Project ID

P127338

Project Name

BZ Climate Resilient Infrast.

Country

Belize

Practice Area(Lead)

Urban, Resilience and Land

L/C/TF Number(s)

IBRD-84160

Closing Date (Original)

31-Aug-2019

Total Project Cost (USD)

29,378,670.87

Bank Approval Date

27-Aug-2014

Closing Date (Actual)

30-Aug-2021

IBRD/IDA (USD)
Grants (USD)

Original Commitment

30,000,000.00

0.00

Revised Commitment

29,378,670.87

0.00

Actual

29,378,670.87

0.00

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2. Project Objectives and Components

a. Objectives

According to the Financing Agreement (FA, p. 6) and the Project Appraisal Document (PAD, paragraph 15), the Project Development Objectives (PDOs) were "to enhance the resilience of road infrastructure against flood risks and impacts of climate change; and to improve the borrower's capacity to respond promptly and effectively in an eligible crisis or emergency."



The objective was revised at restructuring (see Dates below) "to enhance the capacity to promote climate and flood resilience in road infrastructure designs."

This review will parse the PDO into the following objectives against which project performance will be assessed:

- to enhance the resilience of road infrastructure against flood risks and impacts of climate change.
- to enhance the capacity to promote climate and flood resilience in road infrastructure designs (revised).
- to improve the borrower's capacity to respond promptly and effectively in an eligible crisis or emergency.

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

Yes

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

Yes

Date of Board Approval

05-May-2021

c. Will a split evaluation be undertaken?

Yes

d. Components

1. Climate Resilient Infrastructure: (US\$21.5 million at appraisal; revised to US\$2.6 million at restructuring, US\$2.6 million actual). This component was to finance feasibility and engineering studies of critical road infrastructure and associated drainage and flood mitigation systems within the primary and secondary road network in the priority areas. The activities to be financed included riverbank strengthening, small scale flood mitigation improvements, rehabilitation and replacement of critical small-scale bridges, slope stabilization, and road improvements. A first indicative sub-project was 16 km of the Philip Goldson Highway (PG Highway) from the airport junction to mile 20. Additional sub-project sites were to be identified at implementation. At restructuring (see Dates below), activities to be financed were limited to feasibility and engineering studies of critical road infrastructure in the priority areas.

2. Technical Assistance for Improved Climate Resilience Management: (US\$4.9 million at appraisal; revised to US\$4.3 million at restructuring; US\$3.6 million at closing). This component was to finance technical assistance (TA) to strengthen the capacity of the Ministry of Transport and Works (MOTW), renamed the Ministry of Infrastructure and Housing Development, (MIHD), and the Ministry of Natural Resources and Agriculture (MNRA), renamed the Ministry of Natural Resources (MNR). The capacity building TA activities were to mainstream climate resilience in physical and investment plans and strengthen climate resilient asset maintenance. Specifically, the TA was to finance the following:

- In MNR, assist its Land Information Center to consolidate existing geographic information system (GIS) databases, establish data sharing protocols and platform management, manage data and



training programs; and support its physical planning unit to mainstream climate resilient factors and disaster risk information in land use and territorial planning.

- In MIHD, implement its road maintenance strategy, identifying measures and developing technical standards for capital investments to incorporate appropriate climate risk mitigation strategies including flood resilient road infrastructure to strengthen its operations and maintenance (O&M) and asset management capacities.

3. Project Management and Implementation Support: (US\$2.0 million at appraisal; US\$1.9 million at closing). This component was to finance services, training, operating costs, and goods for project management and implementation.

4. Contingent Emergency Response Component (CERC): (US\$1.0 million at appraisal; revised to US\$20.51 million at restructuring; US\$20.86 million at closing). This component was to finance immediate response to an eligible crisis or emergency, defined as “an event that has caused, or is likely to imminently cause, a major adverse economic and/or social impact associated with natural or man-made crises or disasters,” including a disease outbreak (ICR, footnote 10). As a flexible instrument, its activation did not require restructuring (ICR, footnote 12) but was to be financed by reallocating uncommitted funds from other components at the time of activation. This component was updated at restructuring (see Dates below) to finance two sub-components. The first was to finance the increase in two social protection cash transfer programs (US\$12.5 million) - the Building Opportunities for Our Social Transformation (BOOST), and the Belize COVID19 Cash Transfer (BCCAT) programs. The second was to finance the Agriculture Relief Program (US\$8 million) to finance the support to farmers affected by the prolonged drought and market contraction in Belize.

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

Project Cost: The original project cost was US\$30 million. This was revised at restructuring (see Dates below) to US\$29.4 million. The loan disbursed the full amount.

Financing: The International Bank for Reconstruction and Development (IBRD) fully financed this loan.

Borrower Contribution: None

Dates: The project was approved on August 27, 2014 and made effective on April 29, 2015. The Mid Term Review (MTR) was conducted on November 27, 2017. The original closing date was on August 31, 2019. The project was extended by a total of 24 months to close on August 30, 2021. There were three level 2 restructurings:

- On May 18, 2018, to introduce changes to the results framework indicators because of the reduced scope of the first component. The output and outcome indicators and their corresponding targets were revised accordingly and rationalized to provide a standard framework for resilient transport operations (RES31915, paragraph 5).
- On May 20, 2019, to extend the project closing date by 24 months from August 31, 2019, to August 30, 2021. The extension was to address two aspects of delays in implementation. The first, brought by the lack of coordination among the Ministry of Economic Development and Investments (MEDI), the Ministry of Works (MOW), and the Project Management Unit (PMU). The second, brought by the complex technical design of the Philip Goldson Highway to withstand future extreme natural events



- On May 5, 2021, to change the PDO, and component costs by reallocating US\$19.5 million of uncommitted loan funds from components 1 (infrastructure) and 2 (TA) to CERC. The COVID19 pandemic response activated CERC and financed two sub-components to augment the country's social safety net programs.

Split Rating: A split rating was applied to derive the project outcome. The scope of the project was revised to reduce the level of ambition of the infrastructure component at the first restructuring, and the PDO was revised to increase level of ambition of the social protection component at the third restructuring.

3. Relevance of Objectives

Rationale

Country Context: Belize is a middle-income country and is categorized as a small island developing state (SIDS). Among the SIDS, it was ranked 3rd most vulnerable to risks of disasters from natural hazards, and 5th in vulnerability to risks from climate change. The country experienced frequent floods posing great risk to infrastructure and socio-economic activity. The project was to enhance climate and disaster resilience of critical road infrastructure that would reduce risks along key economic and social transportation routes, ensure access to relief services in the event of a natural disaster, and improve capacity for resilient decision-making processes.

Country Plans: The government's long-term development vision was embodied in its Horizon 2030: National Development Framework 2010-2030. The PDOs were relevant to this plan, evident in its relevance to national sector policies for transport and agriculture. Both sectors highlighted the importance of addressing environmental sustainability, and including disaster and climate risks, in development planning. 70 percent of Belize's population live near primary and secondary road networks. The 2013 National Climate Resilient Investment Plan (NCRIP) which aimed to systematically reduce climate and disaster risk in Belize guided project preparation. The financing requirements of the structural, technical and policy interventions were estimated at US\$112.5 million (ICR, footnote 5).

World Bank Partnership Strategy: The PDOs were relevant to the World Bank Group's Country Partnership Framework (CPF) for the period FY18-22 for Belize. This project was directly relevant to its two focus areas: (a) fostering climate resilience and environmental sustainability; and (b) promoting financial inclusion and social resilience. This CPF was informed by the 2016 Belize Systematic Country Diagnostic (SCD). The overarching goal of the CPF was to support Belize in strengthening its economic resilience. The CPF recognized the special characteristics of a small state with capacity and absorptive constraints. The PDOs were also aligned to the World Bank's Green, Resilient, and Inclusive Development (GRID) initiative. The project activities promoted improved institutional capacities, systems, and infrastructure designs to address climate and disaster risks. These efforts were aligned to the GRID Pillars 2-Protecting Poor and Vulnerable Peoples and 4-Strengthening Policies, Institutions, and Investments for Rebuilding Better.

World Bank Experience in the Country and in the Sector: The World Bank Municipal Development Project (MDP, P111928) preceded this operation. It initiated a dialogue and established mechanisms to design, manage and implement climate resilient and disaster risk management projects in Belize. MDP investments in drainage, road, community infrastructure reduced flood impacts in vulnerable areas. Local executives from other municipalities became interested in implementing similar works. The MDP also



developed the capacity of the Social Investment Fund (SIF) and gave the Project Management Unit (PMU) experience in multi-sectoral coordination. The World Bank, through the Global Facility for Disaster Reduction and Recovery (GFDRR) assisted Belize in developing the NCRIP and added value by identifying the structural, technical and policy interventions that would strengthen the country's climate and disaster resilience.

Overall, the relevance of objectives is rated **Substantial** because the PDOs at closing were relevant to both the country's plan and the Bank's partnership strategy for the country.

Rating

Substantial

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

To enhance the resilience of road infrastructure against flood risks and impacts of climate change

Rationale

Theory of Change: At appraisal, the TOC was reflected in the results framework (PAD, Annex 1) to show the causal links between inputs from the four components to produce nine outputs to achieve three outcome indicator targets.

Inputs were to be in two parts: first, physical investments to rehabilitate roads and river crossings, and second, technical assistance to build capacity of the government to manage climate resilient infrastructure. These were to include training in GIS analysis, spatial data management, road maintenance, road maintenance fund, flood risk analysis and disaster risk mitigation. These inputs were logically derived from the activities and project components.

Outputs were to be the construction of flood-resistant non-rural roads, drainage, culverts, and flood-resistant river crossings. The technical assistance was to generate hazard maps, trained staff in flood risk analysis and disaster risk mitigation, creation of a road maintenance unit in MOWT, and methodologies to track flood risk reduction investments. Outputs were also to include the operationalization of the National Land Use Policy plan and the adoption of an Integrated Planning Framework for land resources. These outputs were reasonably attributable to the inputs above.

Outcomes targeted the residents who were to benefit from the improved roads, the reduced impact from flood events measured by the reduced number of days that interrupted access to these roads and making available flood risk data to stakeholders for incorporation into their respective national plans. These outcome indicators were more at an intermediate rather than at outcome level (see Section 9 M&E Design below). While target beneficiaries were a reasonable indicator of the reduced impact from environmental and natural hazard risks, others could also have been used, e.g., road service standards met, facilitated increase



in trade and commerce, efficiency in travel time, improved safety of pedestrians, commuters, or vehicles. Strengthened capacity in building flood-resilient roads was to be met by the availability of flood risk data to stakeholders. The TOC included the following assumptions to increase the likelihood of achieving this objective: the government has approved the proposed disaster resilient policies and tools; trained staff was retained; and resources to sustain outputs were in place. There was no indication that this last assumption materialized.

Outputs:

- 17 river crossings and culverts were improved (the original target of 12 was exceeded).
- 9 km of non-rural roads were rehabilitated (the original target of 30 km was not achieved).
- 101 individuals were trained (the target of 115 was almost achieved).
 - The Ministry of Transport and Works (MOTW renamed Ministry of Infrastructure and Housing Development, MIHD) trained 20 people (3 females, 17 males) in GIS analysis (the target of 20 was achieved); 35 people were trained in road maintenance (the original target of 100 people was not achieved), and 10 people were trained in flood risk analysis (the original target of 15 was almost achieved).
 - MNR, through the National Spatial Data Infrastructure (NSDI), trained 36 staff in GIS analysis (6 females, 30 males) (no target).
- MNR also completed the following:
 - Established NSDI as a platform to harmonize data collection, storage and sharing of information on flood vulnerability, LiDAR maps, and other relevant data across sixty government and statutory bodies. NSDI Data collection guidelines were developed to strengthen the operational capacities of the NSDI. The target was achieved.
 - Generated a total of 33 localized hazard maps and related data layers that included flood hazards, sea walls, hurricane shelters, police stations, fire risks, agriculture, education centers, and urban land use at the global, national, and local levels (the target of 25 maps and layers was exceeded).
 - Updated the National Land Use Policy on September 7, 2018, incorporating climate resilience and disaster risk management in infrastructure planning. The Bank Task Team clarified that this draft was not presented to the cabinet for approval. MNR also prepared an implementation road map and action plan, a communication strategy and plan, and a resource mobilization strategy on January 29, 2019 (ICR, paragraph 33). The Bank Task Team clarified that since this Land Use policy was not approved by the cabinet, the above plans and strategies were not implemented.
- MIHD was to acquire a road maintenance management information system (MIS) in place of a planned road maintenance unit (ICR, paragraph 90) but this was dropped when CERC was activated. The original target was not achieved.

Outcomes:

- The NSDI shared its data across sixty government and statutory bodies. Institutions and line ministries used NSDI data to prepare climate resilient development plans. The target to make flood risk data available to all stakeholders for inclusion in national plans was achieved.
- Data from methods and surveys noted above was used to develop hydrological models to determine flood risk and strengthen the disaster and climate resilient design of the PG Highway.
- At closing, the cabinet had not yet approved the updated National Land Use Policy.



- The indicator - number of days that the improved roads would be accessible after flood events- was replaced at the 2018 restructuring (see below). With a baseline of 20 days, the original target of 10 days was dropped,

Overall, the efficacy of the project to achieve this objective is rated **Modest**. Some gains in building capacity to manage flood resistant road investments were evident in the adoption of designs for future road investments.

Rating
Modest

OBJECTIVE 1 REVISION 1

Revised Objective

The objective was not changed.

Revised Rationale

Revised Theory of Change: The TOC was revised. The May 2018 restructuring reduced the scope of the project components. The target values of input, output, and outcome indicators were revised to better establish the causal link that would test the revised TOC. Additional inputs were to replace the reduced scope of the infrastructure investments.

Revised inputs: The target values of the road, crossings, and culverts to be rehabilitated were revised. Investments were to be added to improve off-site and road drainage. These revised inputs were logically linked to the expected outputs and expected outcomes to achieve the objective. The capacity building inputs were rationalized to enhance capacity of technical teams to analyze disaster and climate resilience of investments and clarified the indicators to better establish the causal link that would test the theory of change and be less subjective. Added inputs included hydrological and geological assessments.

Revised outputs The target values of the rehabilitated non rural roads, river crossings, and culverts were adjusted because of the reduced scope of the infrastructure investments. The revised outputs were also to include the length of improved flood-resilient off-site and road drainage, hydrological and geological assessments, and a standardized results framework for future Bank-financed resilient transport operations. The capacity building outputs were redefined with less subjective indicators. These revisions were reasonable to strengthen the causal link of inputs to outputs to outcomes.

Revised outcomes were limited to direct beneficiaries from the 6 communities of the project area. The length of time that the improved roads would withstand flood events replaced the number of days in which roads remained inaccessible after flood events. No new assumptions were introduced.

Revised Outputs:

- 9 km of non-rural roads were rehabilitated (the revised target of 26 km was not achieved).
- 17 river crossings, culverts were improved (the revised target of 50 was not achieved).



- Two new outputs were: 2 km of improved off-site drainage (the target of 6 km was not achieved) and 3 km of roadside drainage (the target of 10 km was not achieved).

Revised Outcomes:

- The project design adopted a 25-year return period standard for roads to withstand a flood event (baseline of 50 years, the target was achieved). This new standard was used to design the PG Highway as first road in Belize to be designed to this standard. The new standard was to be used in future infrastructure design and construction

Overall, the efficacy of the project to achieve this revised objective is rated Substantial with moderate shortcomings. Adopting new standards showed some evidence of enhanced capacity to design climate resilient road investments. This outcome, however, reflected the moderate shortcoming that the actual construction has not tested the resilient road design. The National Land Use Policy Implementation Road Map was developed but not yet implemented. There is a reasonable expectation that this would be achieved in the short term.

Revised Rating

Substantial

OBJECTIVE 1 REVISION 2

Revised Objective

To enhance the capacity to promote climate and flood resilience in road infrastructure designs

Revised Rationale

Revised Theory of Change: The May 2021 restructuring revised the PDO entirely, leading to a second revision of the TOC. Output and outcome indicators were limited to what had already been achieved since the procurement of the road works was cancelled. Funds were to be reallocated to CERC as emergency response to COVID19 and the prolonged drought.

Revised Inputs: The revised inputs were to be limited to designing climate resilient roads. The capacity building inputs that were achieved under the first revision above remained.

Revised Outputs: All outputs associated with rehabilitating the roads to climate resilient standards were to be dropped. Outputs were now limited to climate resilient designs of the road investments. The revised outputs could be reasonably attributed to the revised inputs.

Revised Outcomes: The direct beneficiary target value was increased but this was associated with the families receiving emergency support through social and agriculture assistance programs under CERC. The revised outcomes included how the LIDAR and DSDI data were used to arrive at disaster and flood resilient road infrastructure designs. No additional assumptions were made.

Revised Outputs:

- The following outputs were dropped:



- Number of river crossings/culverts;
 - Length of off-site drainage;
 - Length of roadside drainage;
 - Length of rehabilitated non-rural roads;
 - Updated Inventory of primary roads assets;
 - Primary road condition survey conducted and reported;
 - Number of localized hazard maps generated and shared.
- A new material testing laboratory was constructed and equipped for use by MIDH to independently test and verify geophysical and hydrological site conditions and the integrity of construction material, such as aggregate, asphalt, and concrete.
- The new outputs achieved their respective targets:
 - The final design for the Philip Godson Highway (PG Highway) met climate and disaster-resilient standards and was delivered on April 2020.
 - Methodologies were adopted and surveys were conducted to track flood risk reduction measures to be included in the design, construction, and maintenance of road investments. These included (i) LIDAR surveys that captured topographic data for 17 percent of Belize (the target of 12.7 percent was exceeded). LiDAR is a remote sensing method that uses a pulsed laser light to measure variable changes in elevation heights; (ii) flood inundation models; (iii) primary road condition survey; and (iv) an updated inventory of primary roads assets.

Revised Outcomes:

- The NSDI data, including hazard maps and layers informed the PG Highway resettlement negotiation packages. Location maps were generated for Project Affected People (PAP). Access to the NSDI data allowed institutions to integrate resilience in design processes and decision-making. NSDI can be updated with new information to capture evolving climate and disaster risk information.
- The LiDAR data was used to assess flood risk and integrate climate and disaster risk resilience in the design of new road investments. MIHD used the new design standards for new infrastructure projects across Belize to replace culverts, bridges, and roads to be financed by other international financing institutions. These included the Mile 38 bridge and culverts, the George Price Highway, and the Nago Bank Road in northern Belize, the Roaring Creek Bridge, the new Haulover Bridge, 59 km of roads, 6 new bridges, and 3 rehabilitated roads under the BZ \$140 million Coastal Road.
- The Central American Bank for Economic Integration (CABEI) is expected to finance the PG Highway. The US\$24 million 24-month construction project was submitted to the CABEI board in April, 2022. The project was expected to start in the second half of 2022.
- The MIHD used the material testing laboratory to test the strength of existing road infrastructure and the quality of materials for new projects. No further outcomes were reported.

Overall, the efficacy of the project to achieve this revised objective is rated Substantial also with moderate shortcoming as noted above.

Revised Rating
Substantial



OBJECTIVE 2

Objective

To improve the capacity to respond promptly and effectively respond in an eligible crisis or emergency.

Rationale

Theory of Change: The original TOC followed the practice allowed IPF projects financed by IDA, IBRD and trust funds to include a CERC component to provide swift response in the event of an eligible crisis or emergency. Crisis or emergency was “an event that has caused, or is likely to imminently cause, a major adverse economic and/or social impact associated with natural or man-made crises or disasters.” Such events may include a disease outbreak (ICR, footnote 10).

Input was to be the preparation of an Operations Manual. This would outline an emergency action plan to train staff and disburse funds for an eligible emergency or crisis.

Output was to be the CERC Operations Manual and completion of training.

Outcome was to be the beneficiaries of CERC funds and an enhanced capacity of the government to respond to an emergency. A critical assumption to increase the likelihood that this objective would be achieved was that an eligible emergency or crisis was to occur. Two emergencies activated CERC during implementation.

Outputs:

- The CERC Operations Manual was completed (the target was achieved).
- CERC training was conducted for officials from the Ministry of Finance (MOF), the National Emergency Management Office (NEMO), SIF, and the PMU on institutional mechanisms to prepare for the 2017 hurricane season. Training also involved maintaining an up-to-date registry and list of pre-qualified suppliers and contractors in the relevant ministries (the target was achieved).
- Information technology (IT) equipment were procured. Investments included a server and software to run the NSDI, desktops and laptops, printers and plotters, tablets for data collection, and satellite phones and GPS equipment for field-based activities.

Outcomes:

- MIHD has a database of pre-qualified suppliers and contractors to identify contractors with standard pricing to deploy in future emergencies.
- The IT equipment enhanced capacities in processing speeds and storage capacity, collection of data, assessment of damage, and dissemination of emergency information. For example, the 2020 Tropical Storm Eta, caused flooding in Cayo, Belize and Stann Creek districts. MNR used tablets, satellite phones, and GPS equipment to rapidly conduct emergency assessments of affected areas and define response plans in coordination with NEMO.

Overall, the efficacy of the project to achieve this objective is rated Substantial. Systems were in place to respond to an emergency evident in the government response to Storm Eta (before CERC was activated).



Rating

Substantial

OBJECTIVE 2 REVISION 1

Revised Objective

To improve the capacity to respond promptly and effectively respond in an eligible crisis or emergency.

Revised Rationale

The objective was not changed.

Revised Theory of Change: CERC was activated. Unused funds from components 1 (infrastructure investments) and 2 (capacity building) were to be reallocated to CERC. Implementing CERC was to demonstrate the enhanced government capacity to respond promptly and effectively to an eligible crisis or emergency.

Revised Inputs: The emergency action plan was to prescribe the use of the cash transfers for social protection. Funds were to assist vulnerable families to alleviate the impact of COVID19 including farmers experiencing agriculture market contractions due to COVID19 and the long drought that began in 2019. Funds were to be used for drought relief; and agricultural inputs, support for post-harvest management, technical assistance, and financial support to protect farmers from further economic loss, volatile demand, and to strengthen food security.

Revised Outputs: The cash transfers were to be distributed under three programs - the Boosting Opportunities for Our Social Transformation (BOOST), the Belize COVID19 Cash Transfer (BCCAT), and the Agriculture Relief programs. These revised outputs could be reasonably attributed to the CERC inputs.

Revised Outcomes: Two new PDO outcome indicators were added. These were vulnerable beneficiary families receiving social protection and agricultural relief support. These indicators were more at an intermediate rather than outcome level but were reasonable. Qualitative assessments at closing added evidence of outcome.

Revised Outputs: New outputs were added:

- 2,269 vulnerable households affected by COVID19 received payments under the vertical expansion of the BOOST Program (the original target of 2,300 households was substantially achieved).
- 20,510 households received payments under the BCCAT program (the target of 10,500 households was exceeded).
- 57 percent of BCCAT households in Categories II and III benefited (the target of 75 percent was not achieved).
- 6,740 farmers received cash compensation under the Agriculture Emergency Assistance Program (AEAP) (the target of 5,543 farmers, was exceeded).
- 2,481 female farmers received cash compensation under the AEAP. MOA targeted female farmers who registered because they were deemed more vulnerable to the crises affecting the agriculture sector (the target of 2,029 female farmers was exceeded).



- A qualitative assessment of beneficiary satisfaction with support from CERC to mitigate impacts of COVID19 was conducted, as targeted.

Revised Outcomes:

- Overall, CERC beneficiaries included 176,535 direct beneficiaries or 44,785 households (the revised target of 90,081 persons was exceeded); 40.2 percent were female beneficiaries (the target of 51 percent was not achieved). Beneficiaries included poor and vulnerable families, pregnant women, children, the elderly (those not receiving pensions); persons with disabilities, households affected by the COVID19 but were excluded from the existing social safety net programs; and farmers experiencing losses due to both COVID19 and the prolonged impacts of the 2019 drought in the northern and central regions of the country.
- 86,560 individuals received support from social assistance programs or unconditional cash transfers (the target of 92,355 beneficiaries was almost achieved) The target was expressed as the number of families in the main text but Annexes 1 and 4 reported this as individuals.
- 86,829 farmers received emergency support under the Agriculture Emergency Assistance Program. Over 21,000 households benefited from the agriculture emergency assistance programs with over 12,700 households receiving climate resilient voucher packages to build greenhouses, install drip irrigation systems, and buy seeds for cash crops; another 8,500 households (including nearly 2,500 women-headed households) farming less than 20 acres of land receiving direct cash transfers of US\$ 250 per household.

Overall, the efficacy of the project to achieve this revised objective is rated Substantial.

Revised Rating
Substantial

OVERALL EFFICACY

Rationale

The overall efficacy of the project to achieve the original objectives is rated Substantial. The efficacy of the project to achieve the first objective is rated Modest while the efficacy of the project to achieve the second objective is rated Substantial.

Overall Efficacy Rating

Substantial

OVERALL EFFICACY REVISION 1

Overall Efficacy Revision 1 Rationale



The efficacy of the project to achieve the revised objective 1 is rated Substantial. The efficacy of the project to achieve the unrevised objective 2 but with revised indicators is rated Substantial. The revised overall efficacy of the project to achieve its objectives is rated Substantial.

Overall Efficacy Revision 1 Rating

Substantial

OVERALL EFFICACY REVISION 2

Overall Efficacy Revision 2 Rationale

The efficacy of the project to achieve the revised objective 1, revision 2 is rated Substantial. The efficacy of the project to achieve the unrevised objective 2 with revised indicators is rated Substantial. The revised overall efficacy of the project to achieve its objectives is rated Substantial.

Overall Efficacy Revision 2 Rating

Substantial

5. Efficiency

Economic Efficiency: At appraisal, a cost benefit framework incorporated climate change scenarios. Each sub-project feasibility study was to include an economic analysis comparing the costs of the interventions against estimated benefits from selected climate scenarios. The analysis used a 12 percent discount rate. The Net Present Value (NPV) of the investments ranged from US\$25.7 million to US\$35.1 million. The estimated Economic Internal Rate of Return (EIRR) ranged from 23 to 26 percent (PAD, paragraph 44 and Annex 6, paragraph 3).

At closing, a comparable cost benefit analysis was not conducted. The first restructuring reduced the road investment to only a section of the PG Highway from the international airport junction to mile 20. Lack of financing cancelled a second potential segment. A subsequent restructuring dropped the infrastructure investments altogether. Funds were reallocated to finance the social protection response to COVID 19 and drought assistance.

Economic efficiency of the project focused on the benefits from the emergency assistance under CERC. These included the following:

- **Under Social Protection:** BOOST added six months of conditional cash grant payments to over 2,200 households. BCCAT provided unconditional cash transfers for six months to over 21,300 households who were not BOOST recipients. Beneficiaries reported that they used the assistance for food, medicine; pay utilities such as water, electricity, and internet bills; and pay school related expenses.
- **Under the Agriculture Emergency Assistance.** The agriculture emergency assistance programs benefited over 21,000 households. Over 12,700 households received vouchers for seeds, fertilizers,



irrigation equipment, poultry and animal stock, animal feed, fencing material, and veterinary supplies. Almost 8,500 households received direct cash transfers of US\$ 250 per household. The value of the outputs, plus the benefit derived from a revitalized agricultural sector that kept food prices low was reported to exceed the US\$ 9.3 million costs of the programs but no figure was provided. Over 99 percent of the recipients of the agriculture emergency relief stated that they were very satisfied or satisfied with the benefits received.

Administrative and Operational Efficiency. The project was extended by 24 months. Deficient early inter-ministerial coordination led to delays. The PMU was unable to address early procurement and contract management challenges (see Section 10 Procurement below). After funds were reallocated to CERC, loan proceeds were fully used within 14 months without financial issues (See Section 10 Financial Management below). The social protection component was administered using existing procedures to cover assessment, approval, enrollment, and payment. BOOST beneficiary households were enrolled in its database. BCCAT households were selected from applicants to the COVID 19 assistance. Electronic system processing of the social protection support led to its efficient delivery. BOOST beneficiaries availed of the existing countrywide network of credit unions. BCCAT beneficiaries availed of mobile payments systems the government established with the National Bank of Belize and Digicell. The government used its own resources to cover the administrative costs of the programs (ICR, Annex 4).

Overall, the project efficiency is rated Modest. Implementation risks were not adequately mitigated resulting in procurement delays. The original cost benefit analysis was not comparable between appraisal and closing because no analysis was conducted at closing. A quantitative least cost analysis was not prepared; hence the project's cost effectiveness could not be ascertained. Infrastructure investments were cancelled. Although CERC was activated and was efficiently administered, the project was extended for a total of 24 months.

Efficiency Rating

Modest

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

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

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

6. Outcome

The split rating of the overall outcome of the project is Moderately Satisfactory. See calculation below.



		Restructuring		
	Original	May 18, 2019	May 20, 2019	May 5, 2021
Relevance of Objective	Substantial			
Efficacy				
Objective 1 - to enhance the resilience of road infrastructure against flood risks and impacts of climate change	Modest	Modest		
Objective 1 Revised - To enhance capacity to promote climate and flood resilience in road infrastructure designs			Modest	Substantial
Objective 2 -To improve capacity to respond promptly and effectively in an eligible crisis or emergency	Substantial	Substantial		
Objective 2 with Revised Indicators			Substantial	Substantial
Overall Efficacy	Substantial	Substantial	Substantial	Substantial
Efficiency	Modest			
Outcome	MS	MS	MS	MS
Numerical Value of Outcome	4	4	4	4
Disbursement (in US\$ millions)	4.64	2.17	16.21	6.2
Share of Disbursement	15.8	7.4	55.4	21.2
Weighted Value of outcome rating	0.635	0.297	2.219	0.848
Final Outcome Rating =0.635+0.297+2.219+0.848= 4 = MS				

a. Outcome Rating

Moderately Satisfactory

7. Risk to Development Outcome

The following pose risks to the project outcomes:

- **Risk from delayed construction of the PG Highway.** The PG Highway was the first road to be designed with measures to manage climate and flood risks and enhance road safety. However, if CABIE financing for the construction of PG Highway is not secured, the resilient measures and capacities built may not be realized. Construction delays will also pose risks. Vendors have begun to relocate along the PG Highway and may require new resettlement plans. To mitigate this risk, the government will need to pursue renewed commitments from CABIEI to complete the road.
- **Risk from reduced government commitment to maintain technological improvements introduced by the project.** In this project, technological improvements were introduced. Investments in the NSDI and materials laboratory require resources and staffing to sustain the built capacity. Regular meetings were held early after the establishment of the NSDI committees. But coordination committees were no longer meeting regularly. The NSDI is not yet fully operational. The investments in equipment requires maintenance and training. The ICR mission in February 2022 noted that staff trainings and equipment calibration are needed at the material testing laboratory.



8. Assessment of Bank Performance

a. Quality-at-Entry

The Bank team designed the project noting its substantial relevance to the country's plans and the Bank's strategy for the Small Island Developing State (SIDS). With the help of a Multi Criteria Evaluation process, the NCRIP prioritized key investment in roads because of its critical link to the economic development of the country, and where 70 percent of its population lived near primary and secondary road networks. The country continues to be vulnerable to meteorological hazards (ICR, paragraph 3 and footnote 6). The Bank team conducted adequate analysis of the technical, social, and environmental aspects of the project. Lessons from prior operations such as those from the Disaster Vulnerability Reduction Projects in the Caribbean, the prior Municipal Development Project in Belize, and the projects under the Pilot Program for Climate Resilience informed project design. Among these were evidence-based decision making, integrating flood management and preventive maintenance to reduce disaster risk (PAD, paragraphs 30-33).

Mitigating measures were identified to reduce implementation risks such as action plans, additional staff, and training programs. Selecting the Belize Social Investment Fund's (SIF) Project Implementation Unit (PMU) that had just completed the Bank-financed municipal development project in Belize was intended to reduce implementation risks. However, the mitigating measures to address the risk posed by the innovative and complex technical design of a disaster and climate resilient road investment proved inadequate. Significant weaknesses in the design of the M&E system were noted such as the lack of sufficient indicators to reflect project outcomes although assessments at closing addressed this shortcoming (see Section 9 M&E below).

Overall, the assessment of Bank performance to ensure the quality at entry is rated Moderately Satisfactory primarily due to the inadequate mitigating measures to address implementation risks.

Quality-at-Entry Rating

Moderately Satisfactory

b. Quality of supervision

The Bank team conducted 16 supervision missions over the seven-year implementation period, including virtual missions during the pandemic. The Bank team provided hands-on technical assistance, trainings, capacity-building workshops on procurement, financial management, and safeguards. Technical experts supplemented these training and joined supervision missions to build capacity in road asset management, and on activating CERC. The Bank team developed guidance documents, facilitated institutional coordination mechanisms, such as regular steering committee meetings to overcome delays. The Bank team also communicated with the government to recommended corrective measures to address delays. The Bank team mobilized additional trust fund resources for a road maintenance management information system for MIHD but this activity was canceled when CERC was activated.

The Bank team used the Mid-Term Review (MTR) to reinforce key timelines and deliverables, strengthen the results framework, and restructure the project. The three restructurings addressed implementation



challenges. The first restructuring reduced the scope of the project because funds were sufficient only for one sub-project. Indicators were adjusted accordingly. The second restructuring, following the MTR, called for time bound actions as legal covenants to extend the period to complete the works. The third restructuring activated CERC and added corresponding indicators. Pictures, videos, phone interviews, and a storytelling exercise validated the results and impacts of the project.

The quality of supervision is rated Moderately Satisfactory.

Overall Bank performance in ensuring quality at entry and supervision is rated Moderately Satisfactory. Bank performance in supporting the response of Belize to the COVID-19 pandemic was quick and CERC-funds quickly disbursed. The shortcoming at entry and the unaddressed shortcomings in M&E design at supervision lead to an overall rating of Moderately Satisfactory.

Quality of Supervision Rating

Moderately Satisfactory

Overall Bank Performance Rating

Moderately Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

Two M&E systems were designed. The first covered the original Theory of Change, which documented how the key infrastructure and capacity building activities were to generate nine outputs to achieve three outcomes related to disaster resilient road investments. The Bank team acknowledged that the objectives were over-ambitious. The PDO was not clear on which climate risk or disaster impact was to be reduced beyond the impact from floods, without noting that floods could result from an active hurricane season or a series of combined disasters in a given year. Some intermediate indicators for building institutional capacity were not linked to climate risk resilience. The results framework did not include all possible outcome indicators that would lead to resilient road investments. For example, there was no indicator to meet O&M needs or road service standards. The proposed limited activities (inputs) and outputs were insufficient to achieve an over-ambitious objective (ICR, paragraph 68). Outcome indicators were mostly at intermediate rather than outcome level (i.e., beneficiaries). All indicators had targets, were time-bound, although not all were specific, two were achieved by Yes/No measures. Two indicators had baselines (i.e., number of localized hazard maps, and the return period for resilient roads).

The other M&E system was designed under the Emergency Action Plan under CERC. This was designed during implementation and discussed below. Both M&E systems were project specific although it appeared that aspects of the CERC M&E system was to continue after the project closed.

b. M&E Implementation



Both M&E systems were implemented by the Belize Social Investment Fund (SIF) Project Management Unit (PMU). M&E data was regularly analyzed and informed the reporting of progress and results. Outcome indicators were revised twice. First when the scope was reduced to acknowledge insufficient funds to finance planned investments. Second, when the PDO was revised and CERC was activated. These revisions were made to strengthen the links established by the theory of change. Some weak indicators, particularly those associated with capacity building noted above were not revised during implementation.

The CERC Operations Manual, including the Emergency Action Plan, laid out the CERC M&E system, which defined roles and responsibilities for SIF, the Ministry of Agriculture (MOA), Food Security and Enterprise, and the Ministry of Human Development (MHD), Social Transformation and Poverty Alleviation. Field visits, telephone calls, or a combination of both were undertaken. COVID19 mobility restrictions limited most surveys and assessments to be conducted by phone. The CERC GRM monitored how social protection activities were implemented. Since CERC M&E was implemented under emergency conditions, there is no expectation that it would remain after closing. However, some of the components were part of existing social protection systems and would continue after CERC. For example, the existing baseline data for BOOST was used to target vulnerable households. BCCT household beneficiaries were extracted from those who applied for COVID19 assistance and were not BOOST beneficiaries. The Agricultural Relief Program beneficiaries were obtained from the Belize Agriculture Information Management System (BAIMS), the official registry of all farms in Belize that the MOA updated daily. Beneficiary surveys and storytelling methodologies were added to report on the outcome of CERC. These included semi-structured interviews and environmental portraits of vulnerable households to show how they integrated disaster resilience at the household level. The assessments were focused only at the beneficiary level. No macroeconomic assessments were undertaken to capture the overall impact of the social safety net on the country's disaster resilience. Beneficiaries were not involved in target setting but participated in the surveys and interviews to assess outcomes.

c. M&E Utilization

M&E data were reported regularly to management to address challenges and informed implementation. M&E data informed the MTR. The CERC M&E was used to reach beneficiaries. Surveys and storytelling methodologies were used to supplement the acknowledged weak indicators and justify the impact of the assistance under CERC. CERC M&E data was used to provide evidence of achievement of outcomes.

Overall, the M&E design, implementation and utilization is rated Modest. The first M&E system had weaknesses in design, evident in the lack of indicators to adequately assess achievements related to resilience of road investments. The second M&E system design included indicators that assessed CERC outcome on beneficiaries supplemented by other surveys.

M&E Quality Rating

Modest

10. Other Issues



a. Safeguards

Environmental Safeguards: The project was a category "B" under the World Bank's environmental policies. The following environmental safeguards were triggered: Environmental Assessment (OP/BP 4.01); Natural Habitats (OP/BP 4.04); Pest Management (OP 4.09); Safety of Dams (OP/BP 4.37); and Projects on International Waterways (OP/BP 7.50). Impacts were anticipated to be specific, short-term, and reversible.

An Environmental and Social Management Framework (ESMF) was prepared and disclosed in the country and at the World Bank's websites on April 15, 2014. The PMU was staffed with an Environmental and Social Specialist, with knowledge and experience in environmental and social risk management following the completion of the preceding Bank-financed project. When CERC was activated, the PMU updated the ESMF to indicate that none of the previously anticipated works would be implemented to affect the safety of dams but site specific ESMPs may be needed for CERC-funded irrigation sub-activities. An exception to the notification required under OP/BP 7.50 was granted because CERC was limited to rehabilitating and modernizing existing small scale irrigation systems. CERC Operations Manual also prohibited the use of surface water for irrigation. The revised ESMF was disclosed in the country and the Bank website on August 14, 2020.

Social Safeguards: The following social safeguards were triggered: Indigenous Peoples (OP/BP 4.10), Physical and Cultural Resources (OP/BP 4.11); Involuntary Settlement (OP/BP 4.12) and Projects in Disputed Areas (OP/BP 7.60). A Resettlement Policy Framework, a Culturally Appropriate Planning Framework (Indigenous Peoples Planning Framework or IPPF) and a Resettlement Action Plan (RAP) were prepared. The proposed infrastructure works under Component 1 resettled 30 Project Affected persons (PAPs). The delayed Environmental and Social Impact Assessment (ESIA) and late Social Specialist joining by the time of the MTR led to delays in identifying PAPs and developing the RAPs. A detailed survey identified households and businesses to be affected by the right of way of the project road works. A compensation methodology was developed. The government compensated PAPs for the replacement cost of their structures, loss of income, and provided a relocation allowance and/or relocation assistance. On average, each of the 30 PAPs received BZ\$15,000 (US\$7,500), for a total of BZ\$450,000 (US\$225,000).

The CERC-ESMF was prepared to assess applicable national legislation and possible additional safeguards policies and procedures related to eligible activities in the CERC Emergency Action Plan (EAP). The CERC-ESMF included a screening process to identify and assess risks and impacts from the sites of sub-projects to be financed and guided the preparation of the Environmental and Social Management Plans to support CERC-ESMF compliance.

A Grievance Redress Mechanism (GRM) was in place by December 2017. A CERC-specific GRM was embedded in the CERC ESMF. The GRM indicated multiple channels for receiving grievances with guidelines to illustrate types of complaints, responsible agencies, the level of complexity of the concern or complaint, and timeframe for response and resolution. The GRM also included procedures to resolve allegations of Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH). A communication strategy was implemented to inform beneficiaries on how to submit grievances using traditional media (flyers, television, and radio informational ads, and press releases), and online channels (government websites and Facebook pages).



b. Fiduciary Compliance

Financial Management: Financial management (FM) was reported to comply with Bank policies by submitting satisfactory financial statements and audit reports to the Bank on time. FM capacity risks at appraisal were mitigated by training of the SIF and the line ministries on the World Bank's fiduciary requirements. The SIF, in coordination with other partners, developed a detailed EAP and the CERC OM to define eligible expenditures, beneficiary eligibility criteria, and adequate controls over the use of funds. There were no reports of the misuse of funds.

Procurement: Procurement and contract management challenges delayed implementation. Delayed feedback on technical outputs and delayed consultant outputs, led to low disbursement rates. There were delays in preparing bid documentation and processing of awards. Cases of unsuccessful bids and selection were noted. Significant differences between bid prices and initial estimates cascaded to more delays in completing the feasibility study and the ESIA. Once CERC was activated, procurement of infrastructure works was cancelled. Three of the four procurement risk mitigation measures were established: (i) an action plan to strengthen procurement capacity; (ii) recruiting a procurement officer for the PMU; and (iii) training PMU staff and line ministries staff on procurement. The fourth, establishing a new procurement unit in the SIF was not achieved because the SIF board had not approved the finalized proposal. SIF, however, developed a road market/procurement database with financial and technical data on road contractors active in Belize and in neighboring countries to strengthen its procurement capacity.

The entire selection process for the PG Highway design had to be restarted because of repudiatory breach (ICR, paragraph 64). This delay was resolved and the final design was completed in 2020.

c. Unintended impacts (Positive or Negative)

d. Other

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



According to the ICR, the project's operational experience informed the following four lessons, slightly modified below (ICR, paragraphs 95-98):

- **Investing in risk information systems strengthens the design of infrastructure works.** In this project, activities led to the development of LiDAR surveys to generate flood models and led to a 1:25 year flood return period standard for road works. Data was used to design a climate resilient PG Highway. MIDH adopted the standards to decide future resilient infrastructure designs to be financed by other donors.
- **Designing and implementing climate and disaster resilient infrastructure needs to be matched by adequate experience and capacities of the recipient institutions.** In this project, integrating climate and disaster resilient road infrastructure was new to Belize. National institutions did not have experienced or the capacity to define such investment activities and prepare accompanying bid documents. This capacity gap was not carefully considered during project design. Mitigating measures may avoid delays.
- **Small Island Developing States (SIDS) may benefit from establishing an umbrella PMU to mitigate the limited availability of expertise.** In this project, Belize had a limited number of experts familiar with procedures and requirements of Bank financed operations. The SIF and PMU staff from the previous MDP proved to be an effective strategy for implementing this project. Measures such as a procurement unit within SIF were designed to mitigate the lack of procurement capacity. This and similar efforts were to ensure that institutional knowledge and capacities are retained. Capacity would then be ready for future donor-funded projects. The SIF board had not approved the proposal but if adopted, SIF would have qualified staff and serve as the central management entity for future operations. This could be further explored in Belize and other SIDS.
- **A non-technical implementation agency, like the SIF, may facilitate implementation.** In this project, the SIF experience in managing donor-funded projects and working with multiple ministries and partners helped the rapid response to manage CERC. The SIF PMU mobilized other ministries, government institutions, and private sector partners. SIF established effective working relations with the Ministry of Agriculture, the Ministry of Human Development, National Bank of Belize, and the private telecom operator Digicell to implement CERC activities.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR followed the guidelines and presented a comprehensive overview of the project operation. The theory of change guided the reader on how the ratings were achieved. The report was results-oriented with sufficient description of the strengthened government capacity, evident in the adoption of new standards for future road investments. The CERC component constituted 70 percent of the project financing and was sufficiently assessed. CERC-related findings were supported by evidence and supplemented by additional assessments carried out at closing, as presented in Annexes 8 and 9 of the report. Annex 4 also added information to



complete the account of how the operation proceeded with detailed benefits from the CERC components. Lessons were based on the operation, particularly the benefit of using an umbrella PMU to mitigate limited implementation capacity. This was particularly helpful to effectively deliver CERC-financed support to beneficiaries. The report was candid, acknowledging the over-ambitious PDOs and the relatively weak outcome indicators for the capacity building outcomes. The report's base of evidence supported the ratings, although the justification for the High rating for the relevance of objectives was countered elsewhere in the report by noting that the PDOs were over-ambitious. Some minor shortcomings in the report were reflected in some small inconsistencies. For example, the implementation road map for the National Land Use Policy was reported to not have been developed (ICR, paragraph 38) but was reported as prepared (ICR, paragraph 33 and Annex 1). Changes in project cost allocation from restructuring were not presented in Annex 3 - Project Cost by Components.

a. Quality of ICR Rating
Substantial