

TC ABSTRACT

I. Basic Project Data

▪ Country/Region:	BAHAMAS/CCB - Caribbean Group
▪ TC Name:	Climate Resilience Diagnosis and Mitigation Plan for Public Infrastructure in The Bahamas
▪ TC Number:	BH-T1100
▪ Team Leader/Members:	SCHOLL, PATRICIA LYNN (INE/TSP) Team Leader; PERSAUD, CHRISTOPHER (INE/TSP) Alternate Team Leader; LUCIEN CHUNG (INE/TSP); HORI, TSUNEKI (CSD/RND); AIELLO, ROBERTO GABRIEL (INE/ENE); LEWIS, GILROY FRANCIS (INE/WSA); ALBERTO ELIZALDE BALTIERRA (INE/ENE); ROCA, MARIA EUGENIA (CCB/CBH); ROBERTS, SYRETA (CCB/CBH); BETTY VILLEGAS (INE/TSP)
▪ Taxonomy:	Client Support
▪ Number and name of operation supported by the TC:	N/A
▪ Date of TC Abstract:	28 Feb 2023
▪ Beneficiary:	Ministry of Works and Utilities, The Commonwealth of the Bahamas
▪ Executing Agency:	INTER-AMERICAN DEVELOPMENT BANK
▪ IDB funding requested:	US\$370,000.00
▪ Local counterpart funding:	US\$0.00
▪ Disbursement period:	36 months
▪ Types of consultants:	Individuals; Firms
▪ Prepared by Unit:	INE/TSP - Transport
▪ Unit of Disbursement Responsibility:	CCB/CBH - Country Office Bahamas
▪ TC included in Country Strategy (y/n):	Yes
▪ TC included in CPD (y/n):	Yes
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	Social inclusion and equality ; Productivity and innovation; Institutional capacity and rule of law; Environmental sustainability; Gender equality

II. Objective and Justification

- 2.1 Determine the climate risks posed by climate change related weather patterns and to support the planning and implementation of adaptation measures to improve the resilience of public infrastructure to climate change impacts. Specifically, the aim is to map the degree of severity of risks to critical transport and energy infrastructure posed by natural hazards, increased variability in weather patterns, and extreme climate events to create a prioritized set of risk mitigation investments and costs for the Government of The Bahamas. The analysis will draw on models across New Providence (especially inland areas) and other low-lying Islands to simulate hydrometeorological risks in for a range of climate hazards and potential future damages along road corridors and by extension adjacent public infrastructure (i.e., energy, water and sanitation, health, and education infrastructure).
- 2.2 Infrastructure coverage, quality, capacity, climate resilience, and connectivity are essential to enabling access to jobs, markets, and services, reducing poverty and inequality, and fostering productivity, as well as to recovery and response after a climate-related disaster. An archipelagic nation made up of 700 low lying islands and cays of which 30 islands are inhabited, is located in the Atlantic Ocean and north Caribbean

Sea, The Bahamas is one of the most vulnerable countries in the Latin America and Caribbean region to climate hazard events. According to the IPCC (2022), small island states are increasingly affected by rising temperatures, which are predicted to continue increasing even under the most optimistic scenarios of greenhouse gas reductions. In the Caribbean, additional warming, could lead to a drier region (5–15% less rain than present day). In the past two decades (2000-2020), the country has been hit by 15 major disasters, mainly hurricanes (EM-DAT, 2021). The high winds and flooding from heavy rains and storm surges from these disasters have in total resulted in than US\$6 billion in public infrastructure and housing losses (EMDAT, 2021). Moreover, The Bahamas is expected to experience rising temperatures and reduced rainfall. Combined with a drier climate, more extreme weather events can place additional stress on infrastructure. Damaged transport assets, as infrastructure structural integrity, operational capacity, from increased variability and extreme weather events, that in turn can lead to reduced mobility and access to key destinations, disrupted power, and led to loss of life, and can represent a sizable portion of economic losses.

- 2.3 The most recent evidence on the effects of climate change reveals that natural disasters crises have significant socioeconomic implications for Small Island Developing States (SIDS). The concentration of population centers and infrastructure along mostly in coastal areas, leads to high risks to exposure to storm surge and flooding. Latest estimates show that the largest damages in Caribbean islands have been associated with Tropical Cyclones that have resulted in damages of 82% of GDP on average over the period of 1950-2014. Given that most economic activity, including transportation infrastructure and critical power networks, are located on the coastal areas of the islands, they are highly exposed to the impacts of storms and hurricanes and associated storm surge and inundation.
- 2.4 This TC aims to foster more sustainable and inclusive infrastructure that is resilient to climate change. This TC is aligned with supporting resilient infrastructure for inclusive and sustainable growth.

III. Description of Activities and Outputs

- 3.1 **Component I: Research Design for Strengthening Infrastructure Resiliency and Sustainability in New Providence.** This component will develop a research framework and design a model for the assessment of the risks posed by climate change to infrastructure in the province of New Providence in The Bahamas.
- 3.2 **Component II: Assessment of Infrastructure Resiliency and Sustainability in New Providence.** This component will assess the effects of climate hazards such as flooding and storm surges on transport, energy, and water and sanitation infrastructure. These focused studies will utilize both data from existing and information regarding topology. It will present solutions, investment plans, and policy recommendations to foster sustainable, inclusive, and resilient infrastructure. The plans will be prepared with funding scenarios proposed.
- 3.3 **Component III: Piloting Drone-based Hydrology Modeling, Dissemination, and Institutional Strengthening.** Support government officials to learn about the assessment results and explore solutions to apply for improving climate-resilient infrastructure. Activities include: (i) pilot project to introduce drone and AI technology-based hydrology modeling; (ii) dissemination of the methodology and results of pilot project; and (iii) knowledge transfer workshop to present Korea's technology and practices regarding sustainable and climate resilient transport infrastructure.

IV. Budget

Indicative Budget

Activity/Component	IDB/Fund Funding	Counterpart Funding	Total Funding
Research Design for Strengthening Infrastructure Resiliency and Sustainability in New Providence	US\$50,000.00	US\$0.00	US\$50,000.00
Assessment of Infrastructure Resiliency and Sustainability in New Providence	US\$200,000.00	US\$0.00	US\$200,000.00
Piloting Drone-based Hydrology Modeling, Dissemination, and Institutional Strengthening	US\$120,000.00	US\$0.00	US\$120,000.00
Total	US\$370,000.00	US\$0.00	US\$370,000.00

V. Executing Agency and Execution Structure

- 5.1 At the request of the Government of The Bahamas, the TC will be executed by the IDB through its Transport Division. The IDB's execution will facilitate enhanced coordination among the various Ministries and Agencies within the Bahamas, while the close collaboration with MW&U other relevant authorities throughout the preparation, design and successful execution of the program will help ensure coherence with overall objectives to map at risk public infrastructure and prepare an investment plan.
- 5.2 The proposed execution structure is justified, on the one hand, by the Bank's experience in developing the operational and technical instruments considered in the framework of this TC. In particular, the reasons for assigning the Bank the execution of this TC consider that: (i) the previous experience of INE/TSP will allow the establishment of logical and robust guidelines for the preparation of the studies required by this TC, particularly due to the extensive knowledge in the transportation areas, with the possibility of generating a difference in the quality of the products to be developed; and (ii) for the execution of this TC, coordination with different stakeholders is required, a position in which the Bank is seen as a strategic partner.

VI. Project Risks and Issues

- 6.1 Risk of low engagement from the beneficiaries. The primary risk associated with TC, rests in its dependence on coordination and collaboration within Ministries and Government agencies. Even though there is a well-established need and drive to improve the infrastructure resilience in the Bahamas, there is a risk of low engagement from public officials and stakeholders, principally due to limited execution capacity and conflicting timetables and priorities. A technical working group with government-appointed representatives from the relevant Ministries will be established to provide input in TC activities and maintain momentum within Government.

VII. Environmental and Social Classification

- 7.1 The ESG classification for this operation is "N/A".