Board of Executive Directors
Simplified Procedure
On or after 8 November 2017

PR-4519
24 October 2017
Original: English
Public
Simultaneous Disclosure

To: The Executive Directors

From: The Secretary

Subject: Bahamas. Proposal for a loan for the "Climate-resilient Coastal Management and Infrastructure Program"

Basic Information:

Loan type ..... Specific Investment Operation (ESP)
Borrower ..... Commonwealth of The Bahamas
Amount ..... up to US$35,000,000
Source ..... Ordinary Capital

Inquiries to: Michele Lemay (extension 1838) or Tsuneki Hori (extension 1878)

Remarks: Management has determined that this loan proposal meets the requirements for presentation by Simplified Procedure, in accordance with Part III, Section 2 (paragraph 3.29(b)) of the Regulations of the Board of Executive Directors and document GN-1838-1, paragraph 2.

Reference: GN-1838-1(7/94), DR-398-17(1/15), GN-2884(2/17), CII/GN-341(2/17)

PUBLIC
SIMULTANEOUS DISCLOSURE

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

THE COMMONWEALTH OF THE BAHAMAS

CLIMATE-RESILIENT COASTAL MANAGEMENT AND INFRASTRUCTURE PROGRAM

(BH-L1043)

LOAN PROPOSAL

This document was prepared by the project team consisting of: Michele Lemay (CSD/RND), Project Team Leader; Tsuneki Hori (CSD/RND), Co-team Leader. Members: Roberto Guerrero, Melanie Argimon, Kelsey Schueler and Elizabeth Chavez (CSD/RND); Gerard Alleng (CSD/CCS); Pilar Jimenez de Arechaga (LEG/SGO); Rene Herrera (FMP/CJA); Mario Castaneda (FMP/CBH); Chitralekha Deopersad (CBH/RND); Syreta Roberts and Edwige Baron (CCB/CBH); and Natasha Ward (VPS/ESG).

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ABBREVIATIONS	
AOP	Annual Operational Plan
ASDMP	Andros Sustainable Development Master Plan
BEST	The Bahamas Environment, Science and Technology Commission
BNT	Bahamas National Trust
CRF	Corporate Results Framework
DEFRA	Department for Environment, Food and Rural Affairs
EA	Executing Agency
ECLAC	Economic Commission for Latin America and the Caribbean
EGB	East Grand Bahama
EM-DAT	Emergency Events Database
ERR	External Rate of Return
ESAR	Environmental and Social Analysis Report
ESHS	Environmental, Social and Health and Safety
ESMP	Environmental and Social Management Plan
ESMR	Environmental and Social Management Report
GDP	Gross Domestic Product
GIS	Geographic Information System
GOBH	The Government of The Bahamas
ICZM	Integrated Coastal Zone Management
IDB	Inter-American Development Bank
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
IWECO	The Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States
MEH	Ministry of the Environment and Housing
MLBS	Maritime Limits and Boundaries Services
MOPW	Ministry of Public Works
NDC	Nationally Determined Contribution
NDP	National Development Plan
NPV	Net Present Value
PEP	Pluriannual Execution Plan
PIU	Program Implementation Unit
POM	Program Operating Manual
REAs	Rapid Ecological Assessments
SDG	Sustainable Development Goals
SLR	Sea Level Rise
SMP	Shoreline Management Plan
UIS	Update to the Institutional Strategy
UNCBD	United Nations Convention on Biological Diversity
UNISDR	United Nations Office for Disaster Risk Reduction
UNFCCC	United Nations Framework Convention on Climate Change
WSC	Water and Sewerage Corporation

PROJECT SUMMARY
THE COMMONWEALTH OF THE BAHAMAS
CLIMATE-RESILIENT COASTAL MANAGEMENT AND INFRASTRUCTURE PROGRAM
(BH-L1043)

<table>
<tr><th colspan="5">Financial Terms and Conditions</th></tr>
<tr><td colspan="3" rowspan="2">Borrower: The Commonwealth of The Bahamas.</td><td colspan="2">Flexible Financing Facility[a]</td></tr>
<tr><td>Amortization Period:</td><td>24 years</td></tr>
<tr><td colspan="3" rowspan="2">Executing Agency: Ministry of Public Works (MOPW).</td><td>Weighted Average Life (WAL):</td><td>15.25 years</td></tr>
<tr><td>Disbursement Period:</td><td>6 years</td></tr>
<tr><td>Source</td><td>Amount (US$)</td><td>%</td><td>Grace Period:</td><td>6.5 years</td></tr>
<tr><td rowspan="3">IDB (OC):</td><td rowspan="3">35,000,000</td><td rowspan="3">100</td><td>Supervision and Inspection Fee:</td><td>[b]</td></tr>
<tr><td>Interest Rate:</td><td>Libor based</td></tr>
<tr><td>Credit Fee:</td><td>[b]</td></tr>
<tr><td>Total:</td><td>35,000,000</td><td>100</td><td>Currency of Approval:</td><td>United States dollars chargeable to the Ordinary Capital</td></tr>
<tr><th colspan="5">Project at a Glance</th></tr>
<tr><td colspan="5">Project Objective/Description: The program's objective is to build resilience to coastal risks (including those associated with climate change) through sustainable coastal protection infrastructure, including natural infrastructure and integrated management of the coast. Specifically, the program will finance science-based shoreline stabilization and coastal flooding control measures in East Grand Bahama (EGB), Central Long Island and Nassau/Junkanoo Beach in New Providence, natural infrastructure for hazard resilience through restoration of coastal natural habitats (mangroves, reefs) in Andros and institutional strengthening for coastal risk management. This operation is expected to result in a reduction of economic losses due to natural disasters and an increase in local economic activity through coastal resilience.</td></tr>
<tr><td colspan="5">Special contractual clauses prior to the first disbursement of the financing: The Executing Agency (EA) shall provide evidence that: (i) a Program Implementation Unit (PIU) has been created and a program coordinator, procurement, financial, monitoring and evaluation, and environmental and social specialists have been selected, pursuant to the terms of reference satisfactory to the Bank; and (ii) the Program Operating Manual (POM) has been approved in the terms previously agreed with the Bank, including fiduciary management arrangements, execution plan and environmental and social safeguard compliance provisions (¶3.6). For environmental and social contractual clauses prior to first disbursement, see Annex B of the Environmental and Social Management Report (ESMR).

Special contractual clauses of execution: Prior to execution of works, the Bank shall have received, to its satisfaction, evidence of commitments from each of the participating entities, regarding their responsibilities in relation to the execution of the program in their respective area of competence (¶3.5). For contractual clauses of execution regarding the environmental and social conditions, see Annex B of the ESMR.</td></tr>
<tr><td colspan="5">Exceptions to Bank Policies: None</td></tr>
<tr><th colspan="5">Strategic Alignment</th></tr>
<tr><td colspan="2">Challenges[c]:</td><td>SI ☐</td><td>PI X</td><td>EI ☐</td></tr>
<tr><td colspan="2">Cross-Cutting Themes[d]:</td><td>GD ☐</td><td>CC X</td><td>IC X</td></tr>
</table>

[a] Under the Flexible Financing Facility (FN-655-1), the borrower has the option to request modifications to the amortization schedule as well as currency and interest rate conversions. In considering such requests, the Bank will take into account operational and risk management considerations.

[b] The credit fee and inspection and supervision fee will be established periodically by the Board of Executive Directors during its review of the Bank's lending charges, in accordance with the relevant policies.

[c] SI (Social Inclusion and Equality); PI (Productivity and Innovation); and EI (Economic Integration).

[d] GD (Gender Equality and Diversity); CC (Climate Change and Environmental Sustainability); and IC (Institutional Capacity and Rule of Law).

I. DESCRIPTION AND RESULTS MONITORING

A. Background, Problem Addressed, and Justification

1.1 **Background.** The archipelago of The Bahamas consists of 700 low-lying islands and 2,500 cays, with 80% of land less than one meter above sea level.[1] The maritime territory is also vast, extending 2,000 km and covering approximately 668,600 km.[2] The coastal and marine environment not only dominates the landscape of The Bahamas, it is also a critical component of the economy and Bahamian identity. It was recognized as a pillar of the Vision 2040: National Development Plan (NDP) of The Bahamas.[3]

1.2 The coastal and marine environment's economic impact is most apparent in the tourism sector, on which The Bahamas' economy is heavily dependent. A tropical climate, sandy beaches, fringing reefs and other coastal and marine ecosystems provide ideal conditions for tourism activities. In 2015, The Bahamas received 6.1 million tourists, a 28% increase in only one decade, becoming one of the most dynamic Caribbean tourist destinations. Among all the islands, New Providence (Nassau/Paradise Island) is the largest port of call, receiving 3.2 million passengers in 2015, many attracted by the coast's scenic quality and recreational attractions.[4] An estimated US$2.4 billion of direct tourist revenues were generated in 2015 equivalent to 27% of Gross Domestic Product (GDP).[5] The total contribution of tourism to GDP (including wider effects from investment, the supply chain and induced income impacts) is approximately US$4 billion, or 45% of GDP.[6] With 164,675 persons employed in the tourism sector (just under 50% of the total labor force), the economy depends heavily on tourism for employment.[7] The tourism sector's potential future growth rests predominantly on continued investments in tourism infrastructure and the uniqueness and health of the archipelago's coastal resources.

1.3 Beyond tourism's economic impact, The Bahamas' coastal and marine ecosystems provide other benefits that have value to human well-being (ecosystem services) but are not easily monetized, such as coastal protection, carbon sequestration and cultural values. Coastal protection benefits, including the natural buffering of coral reefs and mangroves against beach erosion and other coastal hazards, are now recognized throughout the Caribbean as natural capital,[8]

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1 The Bahamas Environment, Science and Technology Commission (BEST). "First National Communication on Climate Change." Nassau: BEST, 2001.

2 Maritime Limits and Boundaries Services (MLBS) Ltd. "Desktop Study Report prepared by MLBS Ltd for the Commonwealth Secretariat" London: BNGIS Centre, 2015.

3 NDP Secretariat. "State of the Nation Report." v.2, Nassau: NDP, 2016.

4 Department of Statistics of The Bahamas. "Foreign arrivals to The Bahamas by air and sea, landed and cruise 1998-2015". Retrieved January 14, 2017 from (OEL-9).

5 World Tourism Organization. "Bahamas: Country-specific: Basic Indicators (Compendium) 2011-2015." Madrid: 2016.

6 World Travel and Tourism Council. "Travel and Tourism. Economic Impact 2015. Bahamas." London: 2016.

7 Department of Statistics of The Bahamas. "Foreign arrivals to The Bahamas by air and sea, landed and cruise 1998-2015." Retrieved January 14, 2017 from (OEL-9).

8 Natural capital is defined as the stock of natural resources that provide people with goods and services. Those goods and services provided by nature are ecosystem services.

which should be considered in development decisions.[9] For example, a Natural Capital Project study in Belize, coastal habitats were found to prevent erosion over 340 km of shoreline, atolls and cays resulting in average annual avoided damages of US$2.5 billion. Benefits increased over 50% in a scenario where conservation of natural capital was blended with coastal development.[10] A similar study in Andros, a Bahamian island endowed with unique coastal and estuarine ecosystems and where nearly 40 miles of the populated coast is highly vulnerable to storms and Sea Level Rise (SLR), found that coastal habitats (mangrove and coppice forests, coral reefs and seagrass) reduce coastal risks along almost 71% of the coastline and that the implementation of a plan leveraging ecosystem services to fill development gaps could further reduce the length of shoreline at risk from erosion and flooding by 20%.[11]

1.4 **The problem.** The Bahamas is highly vulnerable to natural hazards, including hurricanes which put at risk both economic activities and associated public infrastructure concentrated along the coast of New Providence and several of the Family Islands. From 1970 to 2016, the country experienced 18 major disasters including hurricanes, affecting 38,000 citizens.[12] Seven or 40% of these 18 major disasters occurred in the last 10 years, signifying that impacts from disasters have increased at an accelerating rate. These events are usually accompanied by severe coastal erosion and flooding, including in densely populated areas where the buffering effect of coastal habitats has been lost. Hurricane Joaquin (2015), which passed through southern islands comprising only 1.5% of the total population, destroyed large segments of five islands (including Long Island) with total damage estimated at US$104.8 million (over 0.1% of GDP).[13] In October 2016, Hurricane Matthew, the first hurricane since 1929 to strike directly both New Providence and Grand Bahama which support the bulk of the country's population, amounted to an estimated US$438.6 million of losses and damages. These events underscore the socio-economic vulnerability of The Bahamas with its small population spread in a large discontinuous area where informal or isolated settlements, housing and basic services located along the shore are not designed in accordance to adequate building codes.[14]

1.5 The Bahamas' vulnerability to natural hazards is likely to worsen with climate change which is projected to exacerbate floods linked to extreme rainfall events, rising sea level and tropical storms.[15] Given its low-lying topography, the country

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9 Wealth Accounting and the Valuation of Ecosystem Services Partnership. Managing Coasts with Natural Solutions: Guidelines for Measuring and Valuing the Coastal Protection Services of Mangroves and Coral Reefs. Edited by M. Beck and G.M. Lange. Washington, D.C: World Bank, 2016.

10 Arkema, K., et al., "Embedding ecosystem services in coastal planning leads to better outcomes for people and nature," Proceedings of the National Academy of Sciences 112.24 (2015).

11 Natural Capital Project. "Andros Phase 1 Final Report." IDB, 2016 (OEL-14).

12 Centre for Research on the Epidemiology of Disasters. "Emergency Events Database (EM-DAT)". Retrieved January 9, 2017 from OEL-10.

13 Economic Commission for Latin America and the Caribbean (ECLAC) and IDB. "Assessment of the Effects and Impacts Caused by Hurricane Joaquin: The Bahamas." IDB, 2016 (OEL-15).

14 See footnote 3.

15 McLean, R.F., et al., "Small Islands." In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the IPCC. Edited by V.R. Barros, et al., 1613-1654. Cambridge: Cambridge University Press, 2014.

is highly vulnerable to SLR[16] with impacts likely to include increased coastal flooding and erosion, mangrove retreat and loss of associated ecosystem services,[17] decreased seagrass bed productivity, and saltwater intrusion into the small lenses of fresh groundwater which are the source of water for some potable water systems.[18] A recent Inter-American Development Bank (IDB) study indicates that the probable coastal flooding exposed area in a 1-in-a-50-year flood event in New Providence is projected to expand to 15% by 2050 due to increasing precipitation caused by climate change.[19] Nationally, one meter SLR would place 36% of major tourism properties, 38% of airports, 14% of road networks and 90% of sea ports at risk.[20] There are various estimates of economic costs associated with these impacts. For example, under the Intergovernmental Panel on Climate Change (IPCC) low impact scenario, projected annual costs would be US$0.24 billion by 2025 (4.2% of 2004 GDP) and US$0.31 billion by 2050 (5.3% of 2004 GDP). Costs double under a high impact scenario.[21]

1.6 **Recent advances in the sector.** The Government of The Bahamas (GOBH) has recognized that future growth and diversification of its tourism-dependent economy depend on ecosystem services, maintaining biodiversity[22] and enhancing the resilience of economic activities to coastal risks, including climate change. Given the strategic importance of the country's coastal zone to economic development, GOBH has made several advances towards climate-resilient coastal management, including with Bank support, such as: (i) National Policy for the Adaptation to Climate Change,[23] including policy directives to address climate change impacts on coastal and marine resources; (ii) Andros Sustainable Development Master Plan (ASDMP) (ATN/OC-14719-BH), an innovative multi-sectoral planning initiative where trade-offs in ecosystem services were modelled for different development scenarios using a highly participatory process to arrive at a widely endorsed ecosystem-based plan; (iii) site selection and feasibility studies for this program, including a draft Policy Framework for Climate resilient Integrated Coastal Zone Management (ICZM) and capacity assessments (ATN/OC-14250-BH / ATN/OC-14251-BH); (iv) Sustainable Nassau Initiative (ATN/OC-15098-BH) supported by the Bank's Emerging and Sustainable Cities Initiative that undertook a baseline risk assessment (coastal and inland flooding and saltwater intrusion) and vulnerability analysis of Nassau and New Providence

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16 The BahamasSimCLIM system indicates that sea level will rise 9.0 cm, 20 cm, and near 70 cm by 2030, 2050 and 2100, respectively. These projections are consistent with the global SLR trend. (GOBH. "The Second National Communication Report of The Commonwealth of The Bahamas under the UNFCCC." Nassau: 2014).

17 Friess, D. and B. Thompson, 2016. "Mangrove Payments for Ecosystem Services: A Viable Funding Mechanism for Disaster Risk Reduction?" In Ecosystem-Based Disaster Risk Reduction and Adaptation in Practice, 42 vols., Edited by F. Renaud et al. Springer, 2016.

18 Simpson, M. et al. "CARIBSAVE Climate Change Risk Atlas - The Bahamas." Barbados: DFID, AUSAID and CARIBSAVE, 2012.

19 Environmental Resources Management. "CE-2 Hazards and Risks: Sustainable Nassau Action Plan." IDB, 2016. (OEL-7).

20 Simpson, M. et al. "Quantification and Magnitude of Losses and Damages Resulting from the Impacts of Climate Change: Modelling the Transformational Impacts and Costs of SLR in the Caribbean." Barbados: UNDP, 2010.

21 Bueno, R. et al. "The Caribbean and Climate Change: The Cost of Inaction." Stockholm Environment Institute and Tufts University, 2008.

22 GOB commitment to protect of 20% of its nearshore marine and coastal environment by 2020 under the Caribbean Challenge Initiative.

23 GOBH. "National Policy for the Adaptation to Climate Change." 2005.

Island and recommended a growth scenario for the future urbanization of Nassau that is reflective of a sustainable city; and (v) the development of a Community Adaptation Plan for Andros supported by the Bank's Multilateral Investment Fund (MIF). Most of the actions taken to date have been small-scale and recently, GOBH estimated the cost of implementing mitigation actions related to Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC), to be over US$900 million through 2030. Adopting measures to protect the coast and increase the resilience of coastal ecosystems are highlighted in The Bahamas NDC (OEL-17), including strategic planning, land use and management plans, environmental guidelines and building codes as adaptation priorities, which is consistent with this program's balanced approach to both physical and institutional investments.

1.7 **Challenges for the sector.** Despite recent advances, enhancing coastal resilience in The Bahamas considering its vulnerability to natural hazards and climate change faces the following challenges:

1.8 Need for sustainable coastal protection infrastructure [24] achieved through science-based analysis and designs an essential element of adaptive coastal resilience. Past studies confirm that coastal hazards (shoreline erosion and flooding) are exacerbated by human-related causes including poor land use practices such as construction of roads and other infrastructure too close to the high water mark, seawalls in high energy locations and invasive species such as casuarina.[25] A review of Bahamian coastal engineering structures constructed previously revealed additional issues such as lack of understanding of the impact of adjacent coastal construction and natural habitats on receding stretches of shoreline and lack of design guidance for coastal structures under various climate change scenarios.[26] Engineering solutions such as seawalls and causeways are failing in several locations in the Family Islands owing to lack of empirical data to inform science-based designs. Although quantitative data on beach erosion rates in The Bahamas are limited, average Caribbean rates are 0.5m y^{-1} with the highest rates in those islands impacted by a greater number of hurricanes such as The Bahamas.[27] Severe coastal flooding associated with storm surges of 2.7 m to 5.4 m height that reached maximum 0.8 km inland from the coast have occurred in Long Island, Andros and Grand Bahama during Hurricanes Joaquin and Matthew.[28] Although the Ministry of Public Works (MOPW) is currently building coastal engineering structures to protect roads and other public infrastructure from these risks, empirical data and modelling on the multiple causes of flooding (tides, wave overtopping, storm surges, inland flooding) and shoreline instability are needed to design lasting solutions. Evidence from The Bahamas and internationally suggests that science-based engineering solutions that are informed by analyses of site-specific coastal processes such as wave regime and

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24 Refers to the full range of structural and non-structural measures (i.e. breakwaters, groynes, seawalls, revetments, beach nourishment, mangrove restoration and other nature-based infrastructure) that control beach erosion, coastal flooding and other coastal hazards.

25 Sealey, N. "Coastal erosion and seawall construction in The Bahamas," and "Casuarina-induced Beach Erosion Revisited, The Bahamas." The 13th Symposium on the Natural History of the Bahamas, 2011.

26 Mott MacDonald. "Final Report, Appendix C." IDB, 2016 (OEL-5).

27 Cambers, G. "Caribbean Beach Changes and Climate Change Adaptation." Aquatic Ecosystem Health & Management 12.2 (2009): 168–76.

28 See Footnotes 13 and 14.

potential climate change impacts are more effective and durable than those that are not.[29] When designed effectively, shoreline stabilization structures can enhance beach quality, contribute to ecosystem productivity and diversity as well as contribute to medium-term economic growth.[30]

1.9 **Threats to natural capital and natural infrastructure.** The rapid degradation of coastal ecosystems exacerbates the archipelago's environmental and socio-economic vulnerability. Based on available data, the country has lost over half of live coral cover of its reefs.[31] Mangrove wetlands of The Bahamas are threatened by land conversion for development and estimates in New Providence indicate a 32% decline in wetlands over the last 30 years.[32] Throughout The Bahamas, invasive species such as casuarina (Australian Pine) cause sand dune erosion and inhibit the growth of native vegetation.[33] These threats amount to losses in natural coastal protection that, increasingly, is being recognized as 'natural infrastructure' that, in suitable locations, has greater adaptive capacity and is often less costly than conventional solutions.[34] A growing body of evidence suggests that coral reefs, mangroves, coppice forests, and seagrass beds can dampen waves and currents in the nearshore and retain sediments, providing cost-effective protection for coastal communities and infrastructure while maintaining or restoring the multiple benefits of coastal habitats for people and ecosystems now and in the future.[35] Nature-based defense projects report benefits ranging from reductions in storm damage to reductions in coastal infrastructure costs. Comparison of costs between nature-based defense projects and engineering structures demonstrates that salt-marshes and mangroves can be two to five times cheaper than a submerged breakwater for wave heights up to half a meter.[36] Recent experience such as a pilot project undertaken by the Bahamas National Trust (BNT), in Bonefish Pond National Park in New Providence shows that, under the right conditions, mangrove restoration can be implemented with the participation of local communities and generate biodiversity conservation benefits.[37] Evidence from post-tsunami initiatives in Thailand demonstrates that the willingness of local communities to participate in mangrove restoration projects is a key sustainability factor.[38] Recent results for Andros show that natural habitats

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29 For example, evidence from the UK on beach management found that empirical monitoring data on wave regime were critical components of effective designs. Department of the Environment, Food and Rural Affairs (DEFRA). "Delivering benefits through evidence: Beach modelling – lessons learnt from past scheme performance." UK: Environment Agency, 2014 (OEL-5). Hughes S A. Coastal engineering challenges in a changing world. Journal of Applied Water Engineering and Research. 2 (2). 2014.

30 Corral, L., et al. "The Impact of Coastal Infrastructure Improvements on Economic Growth: Evidence from Barbados." IDB Working Paper No. IDB-WP-729, SPD and RND divisions, Washington, D.C: IDB, 2016.

31 Dahlgren C. et al. "Bahamas Coral Reef Report Card Volume I: 2011-2013." Nassau: Atlantis Blue Project, 2016.

32 See OEL-7.

33 Sealey, N. "Casuarina-induced Beach Erosion Revisited, The Bahamas." 2011.

34 Narayan, S., et al., "The Effectiveness, Costs and Coastal Protection Benefits of Natural and Nature-Based Defenses," PLOS One 11.5 (2016).

35 For a review of valuation studies of the storm protection value of mangroves in Thailand and wetlands in the US, see. Barbier EB (2015) Valuing the storm protection service of estuarine and coastal ecosystems. Ecosyst Serv 11:32–38. OEL-19.

36 Ibid.

37 Knowles L. et al. Bonefish Pond National Park Restoration: Increased Management Effectiveness through Community Restoration Projects. Proceedings of the 66th Annual Gulf and Caribbean Fisheries Institute. 2015.

38 Barbier E B. Natural barriers to natural disasters: replanting mangroves after the tsunamis, Front Ecol Environment. Research Communications. 2006.

reduce exposure to coastal risks over 71% of the island's east and north coasts, which represents approximately 11% of the national shoreline extent.

1.10 Limited coastal risk data, strategic planning, coordination and technical capacity limit the public sector's ability to engage in project formulation to address coastal risk and climate change. Existing mandates for coastal management are fragmented, with an opportunity to create coordination mechanisms for coastal planning and development. Limited human and institutional capacities are, "factors that make The Bahamas vulnerable to climate change".[39] In addition, there is a scarcity of reliable information on coastal processes, the foundation for understanding, planning and implementing solutions (structural and non-structural) for improving coastal resilience.[40] Critical meteorological, geophysical and oceanographic data are not collected consistently, digitized or widely available to inform decision-making.[41] In addition, gaps in foundational baseline data (e.g., aerial imagery, maps and Digital Elevation Models) inhibit risk and hazard mapping. For example, the existing tidal benchmark[42] and spatial reference systems[43] needed for accurate mapping and integration into a Geographic Information System (GIS) require updating. Further, long-term coastal risk monitoring programs are not in place.[44] For example, previous shoreline monitoring at a New Providence beach was sporadic and unreliable.[45] There are opportunities to employ analytical tools and technology, particularly in GIS.[46] For example, MOPW could benefit from an updated and geo-referenced inventory of coastal assets (sea defenses and environmental assets). In the context of limited budgets for maintenance and construction of coastal defenses, the geographic scale of The Bahamas and dispersion of small populations across many islands, strategic planning to prioritize risk reduction activities is critical. However, this is not common practice and coastal risk management tools are limited (i.e. no requirement for lateral coastal set back).

1.11 **Selected sites.** The geographic scope of the program agreed with GOBH consists of Nassau, New Providence; Central Long Island; East Grand Bahama (EGB) and Andros. Selection criteria included: (i) presence of existing or planned critical public infrastructure at high risk to natural disasters and climate change, (SLR and other coastal hazards); (ii) opportunities to reduce beach erosion, coastal flooding and habitat degradation and improve public coastal access; (iii) associated with priorities for investment and/or is consistent with the NDP; and (iv) high ecosystem services value and potential for use of natural infrastructure. The first three sites were endorsed by the Technical Advisory Committee for ATN/OC-14250-BH, ATN/OC-14251-BH given mainly that Nassau is the country's main economic and

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39 GOBH. NDC under UNFCCC. Communicated November 17, 2015.

40 Field, C. and IPCC, eds. "Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaption: Special Report of the IPCC." New York: Cambridge University Press, 2012.

41 For example, 80% of meteorological data exists only in paper form; detailed records on natural disasters and damages could be standardized and land use and cover maps are not easily accessible.

42 For example, the reference point for vertical elevations in The Bahamas is now approximately 2-4 ft. lower than it should be. (Watson, D. "Project Note: Relating Wellfield Lens Level to Shattuck Datum." The Bahamas Water and Sewerage Corporation (WSC) and United Nations Development Programme, 1983).

43 For example, WSC and the Department of Lands and Surveys collect data using different datum, (OEL-5).

44 GOBH, 2014.

45 Ministry of the Environment and Housing (MEH). "The Fourth National Biodiversity Report of The Bahamas to the United Nations Convention on Biological Diversity (UNCBD)." Nassau: MEH, 2011.

46 Ibid; NDP Secretariat, 2016.

touristic center, Central Long Island is among the most vulnerable sites heavily impacted by Hurricane Joaquin, and EGB is also a highly vulnerable site recently declared as a protected area. Andros was selected because of being the pilot for the ecosystem-based development plan (ATN/OC-14719-BH). Table 1 shows an overview of the selected sites.

Table 1. Overview of selected sites

Junkanoo Beach, Nassau	Central Long Island	EGB	Andros
• **Population:*** 8,292	• **Population (Long Island):** 3,094	• **Population:** 10,127	• **Population:** 9,221
• **Natural capital:** Sandy, rocky shoreline. Coconut palms, grasses, dune creepers, Caribbean Pines.	• **Natural capital:** Wetlands, sandy and rocky shorelines. World's second largest blue hole, mangrove, buttonwood and Caribbean pine forests.	• **Natural capital:** Sandy, rocky, mangrove shorelines. Coppice and Caribbean pine forests, wetlands, tidal creeks, seagrass beds. Marine biodiversity (bonefish, lemon sharks, spiny lobster, snapper, grouper, etc.)** and declared protected area.	• **Natural capital:** Sandy, rocky and mangrove shorelines. Low energy coast protected by the world's third-largest fringing barrier reef; blue holes, hardwood coppice, pine scrub, saltwater marsh, palm savannas.
• **Economic activity:** Major recreational beach primarily for leisure tourism to the east and commercial vending of souvenirs to the west.	• **Economic activity:** Mixture of tourism, bonefishing, flyfishing and commercial construction.	• **Economic activity:** Primarily fisheries (bonefishing, lobster, conch). Tourism (fishing within the creeks).	• **Economic activity:** 80% of all economic activities related to natural resources, (agriculture, tourism, fishing).

* The Department of Statistics. 2010 Census of Population and Housing". Retrieved January 24, 2017 from OEL-11. Population data are for: Fort Charlotte Supervisory District (Junkanoo Beach); Long Island Supervisory District; High Rock Supervisory District (EGB); and Andros District.

** Bahamas National Trust (BNT) "Global Environmental Facility (GEF), Integrating Water, Land and Ecosystem Management in Caribbean Small Island Developing States (IWEco) Project Document." 2016.

Junkanoo Beach, Nassau	Central Long Island	EGB	Andros
• **Hazard exposure:** Storm surge, coastal flooding, sand overtopping, erosion of the public beach area. Impact of damaged breakwaters, recent shoreline construction in adjacent areas and planned developments on shoreline dynamics is unknown.*	• **Hazard exposure:** Storm surge, coastal flooding of main access road for residential areas. The areas not protected by mangroves were most affected by Hurricane Joaquin.** Impact of damaged dykes on shoreline is unknown.	• **Hazard exposure:** Storm surge, coastal flooding and beach erosion affecting main access road, and residential areas. Causeways serving as a critical link for EGB communities to Freeport are experiencing severe flooding owing to inadequate design of drainage infrastructure that does not factor in tidal flows in creeks and mangroves.***	• **Hazard exposure:** Coastal flooding and coastal erosion to beach and main access roads. North Andros (e.g. Lowe Sound) severely impacted by Hurricane Matthew.

* Limited information exists on the exact physical condition of the breakwaters. A full on-site appraisal will be conducted as part of the baseline study planned for Y1. Nonetheless, the Port has provided evidence that commercial vessel operations are being disrupted because of the state of disrepair of the breakwaters which no longer provide reliable continuous protection during storms. In addition, there is empirical evidence that breakwater disrepair has increased the rate of erosion of Junkanoo Beach (Baird, et al, 2008).

** See footnote 13.

*** Cant-Woodside, S., "Rapid Ecological Assessment for East Grand Bahama." BNT, 2016.

1.12 **Experience in the sector and lessons learned.** There is growing international experience demonstrating that an integrated and risk-based approach to managing coasts is an effective response to these issues.[47] Table 2 shows the main lessons learned from countries in the region such as Barbados and Belize and internationally that have embarked on ICZM Programs and how these have been incorporated into the design of this operation. A case study of Barbados found that reactive and stand-alone protective efforts were less effective and that hard and soft engineering structures are more effective if implemented as part of a wider coastal zone management plan.[48]

47 Corral et al, 2016; Banerjee et al. "A Retrospective Stated Preference Approach to Assessment of Coastal Infrastructure Investments: An application to Barbados." IDB, 2016.

48 Mycoo, M. and Chadwick A. Adaptation to Climate Change: The Coastal Zone of Barbados. Proceedings of the Institute of Civil Engineers" – Maritime Engineering 165. 4 (2012): 159-68.

Table 2. Lessons learned and its incorporation into BH-L1034

Theme	Lessons	Incorporation into the design of BH-L1034
Sustainable coastal engineering solutions.	Empirical data collection and modelling of coastal processes to inform designs contributes to their effectiveness and sustainability e.g., Barbados, UK).*	Component 1 investments are designed to incorporate scientific data and analysis (modelling) on coastal processes to be sustainable.
Nature-based coastal protection infrastructure.	In suitable physiographic and ecological conditions, nature-based coastal protection infrastructure is an effective solution to enhance resilience to coastal risks (e.g., Australia, Southeast Asia, US).**	Component 2 investments in Andros (and selected investments in Component 1) are designed to demonstrate how nature-based coastal protection infrastructure is a cost-effective solution for improving coastal resilience in suitable (low energy) conditions.
Institutional capacity building for risk management.	Experience demonstrates that the establishment of an ICZM Program is a gradual process which combines institutional development and planning with data acquisition and investments (i.e., Barbados, Belize, Trinidad and Tobago).***	Component 3 activities for the acquisition of prioritized scientific information on the coastal zone, establishment of coordination mechanisms and capacity building represent a phased approach to ICZM focused on building coastal resilience to natural disasters and climate change which are priorities for national economic development.

* Mycoo, M., and Andrew C. 2012: 159–68; DEFRA, 2014.
** Wealth Accounting and the Valuation of Ecosystem Services Partnership. 2016; Bayraktorov, E. et al. "The cost and feasibility of coastal marine restoration." Ecological Applications 26.4 (2016): 1055-1074.
*** Barbados Coastal Zone Management Program see OEL-12.

1.13 **Program design:** The program is intended to contribute to Vision 2040: NDP and addresses the national priority of creating wealth and employment through a regionally-based approach to sustainable development. Based on the lessons learned and challenges identified above, a focused set of interventions has been identified to increase coastal resilience in selected sites while enhancing overall ICZM capacity. Program design features three key elements: (i) shift from a conventional approach towards a focus on sustainable coastal protection infrastructure that incorporates reliable scientific information on coastal risks, including climate change; (ii) demonstration of the effectiveness and potential co-benefits of natural infrastructure to enhance resilience under suitable circumstances;[49] and (iii) creating a lasting capacity for ICZM in the country through the phased establishment of a Coastal Protection Unit combined with enhancing information management, planning and coordination functions in the MOPW with participating agencies. The program will also assist GOBH in its progress towards attainment of the Sustainable Development Goals (SDG), specifically SDG 13 (Climate Action) – Take Urgent Action to Combat Climate Change and its Impacts; and SDG 14 (Life Below Water) - Conserve and Sustainably Use the Oceans, Seas and Marine Resources for Sustainable Development.

[49] The Sendai Framework for Disaster Risk Reduction, which serves as the global framework to guide disaster risk reduction efforts from 2015 to 2030, identifies ecosystem-based disaster risk reduction as a key solution to building coastal resilience. (United Nations Office for Disaster Risk Reduction. "Sendai Framework for Disaster Risk Reduction 2015-2030." Geneva: 2015).

1.14 **Bank's strategy.** The program is strategically aligned with the Update to the Institutional Strategy (UIS) 2010-2020 (AB-3008) through the cross-cutting theme climate change and environmental sustainability in view of the sustainable green infrastructure aimed at restoring environmental conditions in mangroves and tidal creeks (Component 1), mangrove restoration activities contributing to carbon sequestration (Component 2), baseline data collection and monitoring activities that contribute to understanding climate change impacts (i.e., SLR) (Component 3), and contribution to the indicator reduction of emissions with support of IDBG financing. The program is also strategically aligned with the UIS cross-cutting theme of institutional capacity and rule of law as part of the creation of the Coastal Protection Unit in the MOPW, and the UIS development challenge of productivity and innovation through its focus on human resources, technical expertise and generation of data and knowledge necessary for sustainable coastal protection infrastructure. This program is also aligned with the Corporate Results Framework (CRF) 2016-2019 (GN-2727-6) by the Country Development Results (CDR) indicators: (i) beneficiaries of improved management and sustainable use of natural capital and (ii) government agencies benefited by projects that strengthen technological and managerial tools to improve public service delivery and the Auxiliary Indicators: (i) households protected from flood risk; (ii) terrestrial and marine areas with improved management; and (iii) countries that have improved disaster risk management. The approach is consistent with the IDB Country Strategy with The Bahamas 2013-2017 (GN-2731), which identified coastal risk management and climate change adaptation as priority areas for support. In addition, it is consistent with the Environment and Biodiversity Sector Framework Document (GN-2827-3), the Integrated Strategy for Climate Change Adaptation and Mitigation, and Sustainable and Renewable Energy (GN-2609-1) and Action Plan (GN-2609-3); Tourism Sector Framework Document (GN-2779-7), and the IDB Infrastructure Strategy (GN-2710-5). The program is also included in the 2017 Operational Program Report (GN-2884) and is consistent with the objective of the Disaster Risk Management Policy (OA-704) aimed at assisting borrowers in disaster risk reduction and the Gender Equality in Development Policy (OP-761) through inclusion of gender-disaggregated indicators for gender tracking.

1.15 According to the joint Multilateral Development Banks (MDB) approach (OEL-13) on climate finance tracking, 100% of total IDB funding for this program is invested in climate change adaptation activities. This contributes to the IDBG's climate finance goal of 30% of combined IDB and IIC operational approvals by year's end 2020.

1.16 **Gender additionality.** Female labor participation in The Bahamas is one of the highest in LAC (69.1% vs. 52% in 2014).[50] Per the UNFCC, climate change can have a greater impact on those sections of the population that are most reliant on natural resources such as the rural poor and women. In addition, women can play a critical role in response to climate change due to their local knowledge of and leadership in sustainable natural resources management at the household and community levels. The participatory approach used in the program design for

50 UN Women. "The Bahamas: Overview of the country gender equality status." Retrieved February 1, 2017 from OEL-16; International Labor Organization (ILO). "Women at Work: Trends 2016." Geneva: ILO, 2016.

natural infrastructure offers a unique opportunity for the inclusion of women in the design, monitoring and maintenance of nature-based solutions.

B. Objective, Components and Cost

1.17 The program's objective is to build resilience to coastal risks (including those associated with climate change) through sustainable coastal protection infrastructure, including natural infrastructure and integrated management of the coast. Specifically, the program will finance science-based shoreline stabilization and coastal flooding control measures in EGB, Central Long Island and Nassau/Junkanoo Beach in New Providence, natural infrastructure for hazard resilience through restoration of coastal natural habitats (mangroves, reefs) in Andros and institutional strengthening for coastal risk management. This operation is expected to result in a reduction of economic losses due to natural disasters and an increase in local economic activity through coastal resilience. In addition, the program offers an opportunity for increased inclusion of women in the design, monitoring and maintenance of nature-based coastal infrastructure.

1.18 The program consists of three components tailored to the specific characteristics of the archipelago as follows.

1.19 **Component 1. Sustainable coastal protection infrastructure (US$23.5 M).** The objective of this component is to increase resilience to coastal hazards through science-based shoreline stabilization and coastal flooding control measures coupled with sustainable rehabilitation of adjacent critical public infrastructure at three priority sites (EGB, Central Long Island and Nassau/Junkanoo Beach in New Providence). The component will finance studies (baseline, design and feasibility, management and maintenance plans), works, and the procurement of goods and services for:

(a) causeway removal and rehabilitation (i.e., excavation, replacement of culverts and road resurfacing) preceded by baseline studies (tidal regime, discharge rates, currents, mangrove condition) along approximately 35 km of shoreline in EGB to improve road access for vulnerable coastal communities and restore hydrological flows in mangroves and tidal creeks in the future 48,700 ha EGB National Park;

(b) beach stabilization measures (i.e., groynes and beach nourishment), rehabilitation of the Nassau eastern and western breakwaters and repair of a coastal drainage outlet to reduce the rates of shoreline retreat along the 1 km Junkanoo Beach and protect critical infrastructure. Designs will be informed by oceanographic studies and modelling along the beach and adjacent nearshore waters to understand hydrodynamics in coastal areas and within the harbor under current conditions as well as with planned developments along the coast considering different climate change scenarios; and

(c) shoreline stabilization and coastal flood control measures, a road by-pass and mangrove restoration and associated baseline studies (topography, geotechnical, hydrodynamics) along approximately 15 km of shoreline in Central Long Island to reduce the vulnerability of communities impacted by

Hurricane Joaquin. In Nassau and Long Island, the studies and recommended measures will contribute a Shoreline Management Plan (SMP) to identify short, medium, and long term adaptation measures for coastal resilience. In every case, investment designs strive for: (i) integration of local communities, including property owners near the works to engage them in the design process, monitoring performance and maintenance; (ii) durability and low maintenance costs; (iii) natural disaster and climate-proofing; and (iv) co-benefits including biodiversity conservation.

1.20 **Component 2. Natural infrastructure for hazard resilience in Andros (US$3 M)**. The objective of this component is to enhance communities' resilience to coastal hazards and climate-related impacts through implementation of pilot projects on Andros that demonstrate the effectiveness of natural habitat restoration for coastal protection in line with the Andros Master Plan. The program will finance studies, technical assistance and the procurement of goods and services for pilot restoration efforts in at least one priority site for each district for a total area of approximately 200 ha, through the following set of activities: (i) baseline studies for selection of priority sites for demonstration projects applying socioeconomic and biophysical suitability parameters; (ii) stakeholder consultations and validation workshops of pilot sites; (iii) pilot site assessments, including baseline inventories and diagnostics to inform design and implementation of nature-based solutions; (iv) implementation of conservation and restoration activities (e.g. mangrove reforestation, casuarina eradication) as nature-based solutions for coastal protection informed previous activities; (v) management plan for pilot sites including maintenance and monitoring plan; and (vi) communication plan including community awareness activities and preparation of replicable guidelines to inform future rehabilitation efforts. Stakeholder and community engagement[51] will be a central element of this component, with a view of promoting local participation and engagement to achieve a sustainable impact. Pilot projects and nature-based solutions will be tailored to the unique conditions of each site. They will be designed and implemented to: (i) enhance the adaptive capacity of Androsians and the ecosystems on which they depend to cope with the anticipated impacts of climate change; and (ii) provide a cost-effective means of restoring coastal habitats and associated co-benefits (e.g., fisheries, carbon sequestration, improved aesthetics for tourism and recreation).

1.21 **Component 3. Institutional strengthening for coastal risk management (US$3.5 M).** This component aims to increase MOPW's capacity to engage in coastal resilience project formulation through enhancing institutional capacity and integrated planning. The program will finance studies, technical assistance and the procurement of goods and services for: (i) capacity building and establishing a Coastal Protection Unit, including improving human resources with technical expertise in coastal engineering and sciences, training and technical assistance, strategic planning and provision of equipment and software; (ii) data generation and information management, including design and implementation of a pilot nearshore monitoring program and consolidation of existing baseline data according to the protocols of The Bahamas central repository for geo-spatial data (The Bahamas National Spatial Data Infrastructure); (iii) design and updating of

[51] As part of this, a gender targeted approach will be used in in community resilience activities to increase participation of women.

policy and planning tools (i.e., SMPs,[52] building codes, coastal and natural infrastructure design guidance) to improve and coordinate routine planning exercises for reducing coastal risk and vulnerability; and (iv) assessment of needs and opportunities for financing long term approach to ICZM for risk reduction and climate resilience in The Bahamas.

1.22 **Amount and structure of financing.** The program's total cost is up to US$35 million to be financed with resources from the Bank's Ordinary Capital. Table 3 details the costs and financing.

Table 3: Costs and financing structure (in US$ millions)

Components	IDB	Total	%
1. Sustainable coastal protection infrastructure	**23.50**	**23.50**	**67.15**
1.1 East Grand Bahama	2.50	2.50	7.13
1.2 Nassau/Junkanoo Beach	18.00	18.00	51.42
1.3 Central Long Island	3.00	3.00	8.60
2. Natural infrastructure for hazard resilience in Andros	**3.00**	**3.00**	**8.60**
3. Institutional strengthening for coastal risk management	**3.50**	**3.50**	**10.00**
4. Administration	**2.00**	**2.00**	**5.70**
Program Implementation Unit	1.5		
Financial audits	0.2		
Monitoring and evaluations	0.3		
5. Contingencies*	**3.00**	**3.00**	**8.55**
TOTAL	**35.00**	**35.00**	**100**

* Contingencies are to cover potential delays and cost overruns associated with inclement weather interrupting construction.

1.23 **Key results indicators.** Based on the indicators proposed in the Country Strategy (GN-2731), the CRF and the objectives pursued by the program, the results are expected to be measured in terms of: (i) terrestrial and marine protected areas with improved management in EGB (ha); (ii) number of households with improved road access to Freeport due to flood reduction in EGB; (iii) number of people visiting the beaches in New Providence; (iv) number of households protected from flood risk in Central Long Island; (v) number of people (disaggregated by gender) in the local communities participating in the design, monitoring and maintenance of nature based solutions for coastal resilience in Andros; (vi) amount of CO2 captured by restored mangrove; (vii) beneficiaries of improved management and sustainable use of natural capital; and (viii) number of government agencies strengthened. The Results Framework (Annex II) agreed upon with the executing agency shows a breakdown of result and output indicators.

1.24 **Economic viability.** An economic evaluation (OEL-3) was conducted to assess the viability of sustainable coastal protection infrastructure in Nassau, EGB and Central Long Island, considering a social discount rate of 12%. Overall, the Net Present Value (NPV) of the program is greater than US$106 million. The Internal Rate of Return (IRR) is robust at 20%. Benefits from an improved tourist stream amounts to US$50 million. In addition, expected storm damage reductions

[52] A SMP is a large-scale assessment of the risks associated with coastal processes to reduce these risks to people and the developed, historic and natural environment. SMP's are developed based on sediment cell boundaries and aims to identify: (i) policies to manage risks; (ii) appropriate schemes to put the policies into practice; and (iii) type of work to put the preferred scheme into practice.

because of the program is US$81 million. Furthermore, the economic benefits of erosion control activities, mangrove restoration and beach enhancements for local use is US$1 million. Analysis of the program under a climate change scenario increasing storm frequencies and damage by 15% indicates a NPV of almost US$121 million with an IRR of 22%. Sensitivity analyses were also conducted and, under the most conservative assumptions, the NPV of benefits is still US$61 million with an IRR of 14%, reflecting that the program is a viable investment from an economic standpoint.

II. FINANCING STRUCTURE AND MAIN RISKS

A. Financing Instruments

2.1 The proposed financing instrument is a specific investment loan in recognition that science-based designs tailored to local conditions are required. The disbursement period will be six years from the effective date of the loan contract. The tentative disbursement schedule is shown in Table 4 below.

Table 4. Tentative disbursement schedule (US$ millions)

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
IDB	1.75	5.25	12.25	12.25	1.75	1.75	35
%	5	15	35	35	5	5	100

B. Environmental and Social Safeguard Risks

2.2 In accordance with the IDB's Environment and Safeguards Compliance Policy (OP-703) a Category "B" classification has been assigned to the program, given the nature of the proposed interventions, and their location, it is anticipated that the environmental and social impacts and risks are likely to be mostly local and short term, for which effective mitigation measures are readily available. Additionally, as per the Bank's Disaster Risk Management Policy (OP-704) the program has been assessed for disaster risks and is categorized "medium" due to the risks of tropical storms and hurricanes. Given that the program's objective is to build resilience to coastal risks (including those associated with climate change) through sustainable coastal protection infrastructure, the program has intrinsically incorporated disaster risk management into its strategy, design and implementation.

2.3 An Environmental and Social Analysis Report (ESAR) (ORL-4) was prepared and posted on the IDB's website on February 16, 2017. Per the ESAR and consultation with local stakeholders, there is a series of positive and negative environmental and social impacts and risks mainly associated with the proposed interventions in Component 1 and Component 2. The key Environmental, Social and Health and Safety (ESHS) direct, indirect and cumulative impacts and risk of the program are related to construction of grey infrastructure works (impacts on vegetation, avifauna, biodiversity, hydrology and tidal regime, freshwater resources, as well as impacts resulting from erosion and sedimentation, waste management and air and noise pollution, impacts on local communities, and worker community health and safety). These are in the main part, small scale works on Long Island and EGB, and as such are not considered to have significant adverse environmental or social

impacts. The nature and scale of works in Junkanoo is of a moderate size in a busy tourist harbor area, and as such there may be moderate impacts and risks. If it is determined that further environmental and social analysis is required, this will be presented to the Bank prior to the issuance of tenders for specific works. A basic social baseline was done for the New Providence works; it is expected that the potential impacts to affected people livelihoods will be very limited to negligible since the closure of the main use areas of Junkanoo Beach is highly unlikely. Consultations with local communities were held in all four islands during the preparation phase (December 2016-January 2017), including on the ESAR. Further consultations will be held with stakeholders by the MOPW as the project designs are finalized and the projects are executed, guided by a Community Consultation and Engagement Plan to be developed prior to first disbursement.

2.4 The ESAR (OEL-4) includes an Environmental and Social Management Plan (ESMP) to mitigate that potential environmental and social impacts and risks. The ESMP is a guide that identifies relevant management techniques, including Best Management Practices (BMPs) and Emergency Response Plans, based on site-specific conditions and potential impacts. The ESMP includes a framework for: a Traffic Management Plan, Sediment and Erosion BMPs, Noise, Vibration, Air Quality BMPs, Storm Water Management BMPs, Waste Management BMPs, Removal of Invasive Species, Contractors Commitment to Environmental Compliance, Emergency Protocols (Severe Weather, Spill Prevention and Cleanup), Health and Safety Plan, a Chance Find procedure. Activity specific ESMPs will be developed and implemented by the construction contractors, and will be presented to the Bank for its non-objection prior to the start of construction for specific works. In addition, the EA will put into place the ESHS governance structure (environmental and social specialists) to ensure that the ESMP for the program and specific works is implemented adequately.

C. Fiduciary Risk

2.5 Per the IDB's Institutional Capacity Assessment of the MOPW and the Project Risk Management exercise, the program has a medium fiduciary risk. The risks are associated with potential delays in procurement and financial reporting and control applying IDB policies and procedures with possible delays on the contracts, particularly to build the infrastructure under Component 1 due to permitting and consultation requirements. As mitigation measures the program includes the creation of a Project Implementation Unit (PIU), including fiduciary personnel to support execution, and a Program Operations Manual (POM) to define roles and responsibilities.

D. Other Risks

2.6 A risk assessment was conducted, and the key risks classified as medium level and their associated mitigation measures are: (i) potential delays or interruption in execution due to limited capacity in implementation which will be mitigated with the recruitment of key positions within the PIU prior to first disbursement; (ii) decreased level of commitment by the borrower and executor with upcoming general elections which will be mitigated with public outreach and regular dialogue with GOBH; (iii) low sustainability of investment risk to be mitigated with the design of a rigorous maintenance plan; (iv) delays in acquisition to be mitigated with provision of

training; (v) natural disasters and other contingencies; and (vi) traffic disruption and disturbance to economic activities which will both be mitigated with ESMP implementation.

2.7 **Sustainability**. The science and nature-based designs for infrastructure in Components 1 and 2 provide sustainable, low maintenance solutions to coastal erosion and flooding relative to conventional designs as they are better adapted to localized hydrodynamic conditions and thus reduce the probable need for repair and/or replacement after storm events. The GOBH has also indicated its commitment to the operation and maintenance of the improved infrastructure after the life of the project with the inclusion of technical personnel in the Coastal Protection Unit dedicated to maintenance and monitoring. In addition, the program seeks to involve local communities in the monitoring and maintenance of nature-based infrastructure in Andros.

III. IMPLEMENTATION AND MANAGEMENT PLAN

A. Summary of Implementation Arrangements

3.1 **Borrower and EA.** The borrower will be The Commonwealth of The Bahamas and the EA will be the MOPW. A PIU will be established within the MOPW and will be staffed with specialized personnel, including a program coordinator, a monitoring and evaluation specialist, a procurement specialist, a financial specialist and an environmental and social specialist.

3.2 The PIU will coordinate scheduling and execution of the works and services to be contracted, preparing the bidding documents, and conducting the tender processes. It will manage and oversee the contracts, ensuring compliance with all technical and socioenvironmental specifications, and implement the ESMP and the ESMR. Roles and responsibilities of the PIU and the mechanisms for coordination will be determined in the POM.

3.3 The roles and responsibilities of the PIU to be addressed in the POM will concern the coordination of: (i) implementing and maintaining contract management systems, accounting and financing management, and administering the internal control system for managing program resources in accordance with Bank requirements; (ii) submitting disbursement requests and eligible expense documentation on a timely basis; (iii) preparing and submitting semiannual financial reports, which are to accompany the semiannual progress reports, including the status and use of funds disbursed in the form of advances of funds and the program's consolidated financial reports; (iv) maintaining a separate bank account for management of Bank resources and financial reports and for submitting disbursement requests; (v) maintaining an adequate filing system for documents supporting eligible expenses for verification by the Bank and by external auditors; and (vi) keeping all public information available and updated on the entity's website, including procurement processes, progress on contracts, outcomes achieved, and financial statements.

3.4 In addition, five technical specialists will be hired in the MOPW: a coastal engineer, a coastal scientist, two civil engineers and a surveyor/GIS specialist. It is

anticipated that the program will finance salaries for an initial stage (first two years of execution) and the positions will gradually (25% year 3; 50% year 4; 100% year 5) be merged into the permanent staff of the MOPW. While initially part of the PIU, it is expected that these technical personnel will serve as the Coastal Protection Unit of the MOPW.

3.5 **Participating entities.** In addition to the MOPW, several institutions will participate in the program by providing assistance in their areas of competence. These may include but are not limited to: The Port Authority with respect to port operations, Ministry of the Environment and Housing (MEH) in collaboration with the office of the Prime Minister with respect to compliance to national environmental policy and regulations, NEMA with respect to compliance to disaster risk management policy and the University of The Bahamas with respect to environmental research and monitoring. These institutions will be invited to participate in the Project Technical Advisory Committee and be responsible for reviewing terms of reference, contributing to technical monitoring and supervision and reviewing reports in their areas of competence. Evidence of commitments from each of the participating entities, regarding their responsibilities in relation to the execution of the program in their respective area of competence, will be a special condition prior to execution of works. This condition is crucial to guarantee the sustainability of programs investments.

3.6 Prior to the first disbursement of the financing, **the Executing Agency (EA) shall provide evidence that: (i) a Program Implementation Unit (PIU) has been created and a program coordinator, procurement, financial, monitoring and evaluation, and environmental and social specialists have been selected, pursuant to the terms of reference satisfactory to the Bank.** This condition is deemed crucial to ensure that the EA has the minimum team required to initiate the execution of the program; and **(ii) the Program Operating Manual (POM) has been approved in the terms previously agreed with the Bank, including fiduciary management arrangements, execution plan and environmental and social safeguard compliance provisions.** This is necessary to establish the guidelines and procedures that should be followed by the EA to secure the successful execution of the program.

3.7 **Procurement of goods, works and services.** Procurements will be governed by the loan contract and the Policies for the Procurement of Goods and Works Financed by the Inter-American Development Bank (GN-2349-9) and the Policies for the Selection and Contracting of Consultants Financed by the Inter-American Development Bank (GN-2350-9). The provisions of the loan contract and procurement plan (Annex III), which establish the type of review, processes, and monitoring of procurements under the program, will also be followed. The Bank will conduct ex ante reviews of all procurement processes.

3.8 **Bahamas National Trust (BNT)**. The BNT will be single-source contracted to implement the coastal habitat participatory restoration and monitoring activities in Component 1(a) and Component 2 (¶1.20 (a and b) as it is qualified and has experience of exceptional worth for the assignments, see GN-2350-9 ¶3.10(d). The BNT is a non-governmental, non-profit, membership organization governed by an independent council that includes representatives from the public and private sectors, as well as from international scientific institutions. The BNT's mission is

to conserve and protect the natural resources of The Bahamas, through stewardship and education for present and future generations. The BNT is uniquely qualified to conduct these activities given its exhaustive experience successfully implementing environmental research and monitoring, education and conservation activities in The Bahamas since its creation in 1959. This has included for example the conduct of several Rapid Ecological Assessments (REAs) to gather information about the state of the environment within and outside of national parks, public awareness conservation campaigns and demonstration projects in habitat restoration such as the successful mangrove restoration project at Bonefish Pond in New Providence, all activities included in Component 1(a) and Component 2(b). The BNT also has a proven track record in conducting its research and conservation activities in a highly participatory manner through an extensive local network of over 50 grassroots organizations, clubs and schools. As such, BNT has experience of exceptional work for the assignment of restoration and monitoring activities which require a local participatory approach customized to the cultural identity of the Family Islands and New Providence.

3.9 **Disbursements.** The GOBH´s preferred method of disbursement is through reimbursements, but the options for fund advances and direct payments may be reconsidered by GOBH as necessary during execution. The frequency of these disbursements will be determined by the program's financial programming, to be periodically updated by the EA. The Bank may release a new advance of funds once 80% of all funds disbursed in the form of advance payments have been justified. Disbursement requests will be subject to ex post review.

3.10 **Auditing.** The borrower, acting through the EA, will select and hire an independent auditing firm in accordance with Bank policies and for the entire project execution period, including any extensions of the disbursement period. Annual Audited Financial Statements of the project are to be submitted to the Bank within 120 days after the close of each fiscal period of the PIU, in addition to final audited financial statements, which are due for submission to the Bank within 120 days of the close (last disbursement date) of the project. The government is also given the option to use the services of the Office of The Auditor General who currently has eligibility level II to audit Bank financed projects and that the country strategy has the commitment of maintaining 50% of the portfolio under the supervision of the Office of the Auditor General.

B. Summary of Arrangements for Monitoring Results

3.11 The program's monitoring and evaluation arrangements include inspection visits, management missions, semiannual progress reports, including the MOPW's technical, environmental, and financial considerations, annual external audits, a midterm evaluation of outcomes and a final evaluation report (REL-2).

3.12 **Monitoring.** Comprehensive program monitoring will be performed by the project team and the Bank's Country Office in Bahamas. The project team will conduct inspection visits to the program every six months during the operation's execution period. In addition, the team will conduct annual management missions to assess progress. For its part, the PIU will submit semiannual execution progress reports to the Bank within 60 days following the end of each six-month calendar period, as described in the Monitoring and Evaluation Plan (REL-2), including action taken to

comply with the Bank's environment and safeguards policies. These reports will include at a minimum, the following: (i) executive summary, analyzing the program's physical and financial execution; (ii) monitoring report; (iii) an ESHS compliance report; (iv) updated Plurianual Execution Plan (PEP) and Annual Operational Plan (AOP); (v) risk matrix update; and (vi) procurement plan update.

3.13 **Evaluation.** The MOPW will submit to the Bank: (i) a midterm, independent evaluation report no later than 36 months after the date of entry into force of the loan agreement; and (ii) a final independent evaluation report, within 90 days after the date on which 90% of the loan proceeds have been disbursed or after the Bank's official request. The final evaluation report shall include the results of the program's impact evaluation (see below).

3.14 **Impact evaluation Plan.** The Monitoring and Evaluation Arrangements (REL-2) was agreed upon with the GOBH. The plan presents the methodology, data collection plan, indicators to be measured, sample design and budget allocated to each activity. The proposed empirical strategy is based on a before-and-after research design. The main hypothesis of the proposed impact evaluation is that BH-L1043 will increase resilience to coastal hazards. Resilience is the capacity of humans and ecosystems to withstand and recover from the likely impacts of coastal hazards (including those associated with climate change). Three approaches will be employed to compare outcomes before and after the intervention, namely (i) the construction of a disaster inventory system of natural hazard events that incorporates impacts of disasters of small and moderate scale for retrospective and prospective analysis, including interrupted time-series techniques; (ii) the application of a coastal vulnerability model to evaluate the role of coastal ecosystems in reducing exposure to sea-level rise and storms; and (iii) a segmented regression analysis using statistics to analyze the relationship between total cruise ship tourism expenditures and sustainable coastal protection infrastructure. The outcome variables for the impact evaluation are operationalized notions of resilience, namely (i) economic losses caused by storms and floods; (ii) people injured, evacuated, relocated, with houses being damaged or destroyed, or requiring emergency assistance due to storms and floods; (iii) people exposed to reduced coastal risk due to attenuation of waves, erosion and flooding by coral reefs, mangroves and seagrasses; and (iv) total tourism expenditures in Nassau and Paradise Island. These indicators will be evaluated before and after program implementation.

Development Effectiveness Matrix		
Summary		
I. Corporate and Country Priorities		
1. IDB Development Objectives	**Yes**	
Development Challenges & Cross-cutting Themes	**-Productivity and Innovation -Climate Change and Environmental Sustainability -Institutional Capacity and the Rule of Law**	
Country Development Results Indicators	**-Reduction of emissions with support of IDBG financing (annual million tons CO2 e)* -Beneficiaries of improved management and sustainable use of natural capital (#)* -Government agencies benefited by projects that strengthen technological and managerial tools to improve public service delivery (#)* -Households protected from flood risk (#)* -Terrestrial and marine areas with improved management (ha)***	
2. Country Development Objectives	**Yes**	
Country Strategy Results Matrix	**GN-2731**	**To build resilience to coastal hazards including those associated with climate change through enhanced conservation and management of the coastal zone.**
Country Program Results Matrix	**GN-2884**	**The intervention is included in the 2017 Operational Program.**
Relevance of this project to country development challenges (If not aligned to country strategy or country program)		
II. Development Outcomes - Evaluability	Evaluable	
3. Evidence-based Assessment & Solution	**9.7**	
3.1 Program Diagnosis	**3.0**	
3.2 Proposed Interventions or Solutions	**4.0**	
3.3 Results Matrix Quality	**2.7**	
4. Ex ante Economic Analysis	**10.0**	
4.1 The program has an ERR/NPV, a Cost-Effectiveness Analysis or a General Economic Analysis	**4.0**	
4.2 Identified and Quantified Benefits	**1.5**	
4.3 Identified and Quantified Costs	**1.5**	
4.4 Reasonable Assumptions	**1.5**	
4.5 Sensitivity Analysis	**1.5**	
5. Monitoring and Evaluation	**6.1**	
5.1 Monitoring Mechanisms	**2.5**	
5.2 Evaluation Plan	**3.6**	
III. Risks & Mitigation Monitoring Matrix		
Overall risks rate = magnitude of risks*likelihood	**Medium**	
Identified risks have been rated for magnitude and likelihood	**Yes**	
Mitigation measures have been identified for major risks	**Yes**	
Mitigation measures have indicators for tracking their implementation	**Yes**	
Environmental & social risk classification	**B**	
IV. IDB´s Role - Additionality		
The project relies on the use of country systems		
Fiduciary (VPC/FMP Criteria)	**Yes**	**Financial Management: Internal Audit.**
Non-Fiduciary		
The IDB's involvement promotes additional improvements of the intended beneficiaries and/or public sector entity in the following dimensions:		
Gender Equality	**Yes**	**The participatory approach used in the program design for natural infrastructure offers a unique opportunity for the inclusion of women in the design, monitoring and maintenance of nature-based solutions.**
Labor		
Environment		
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project	**Yes**	**Technical assistance and training (financed by BH-T1040) was provided to relevant institutions by Stanford University in December 2016 in hazard modelling and nature-based solutions to coastal protection.**
The ex-post impact evaluation of the project will produce evidence to close knowledge gaps in the sector that were identified in the project document and/or in the evaluation plan		

Note: (*) Indicates contribution to the corresponding CRF's Country Development Results Indicator.

The objective of the program is to lower the Bahamas' vulnerability to coastal damage from natural disaster, particularly storms, flooding and climate-change induced sea level rise, by implementing sustainable and data-based shoreline stabilization measures in several high-risk areas. The program will implement three components: (i) sustainable coastal protection infrastructure; (ii) natural infrastructure for hazard resilience in Andros; and (iii) institutional strengthening for coastal risk management.

The documentation is well-structured. The diagnostic is based on empirical evidence of the major challenges faced by the country with regards to vulnerability to coastal risks due to insufficient protection measures and weak institutional capacities. The proposed solution is then linked to the problems identified. The results matrix (RM) reflects the objectives of the program and establishes a clear vertical logic, including impact indicators that can capture the program's overall effect on environmental, social, and economic resilience. The RM includes SMART indicators at the outcome (except one) and output level, with their respective baseline values and targets and the means to gather information.

The economic analysis includes a Cost-Benefit Analysis that considers the different benefits from the intervention on: tourism revenue, resident valuation of improved beachfront and ecosystem services, as well as significantly reduced economic costs resulting from storm damages. In general, the benefits are based on a good understanding of the theory of change, and the economic costs include all resource costs as well as costs from a social perspective. Potential issues of double counting benefits are discussed and taken into account in the sensitivity analysis. Overall assumptions appear to be reasonable and appropriate for a CBA based on principles of welfare economics. A sensitivity analysis appears to contemplate key parameters and five alternative scenarios.

The monitoring and evaluation plan presents all outputs and associated costs. The evaluation plan proposes a before-after comparison, a methodology that does not allow attribution. Though additional steps are taken based on available time series data to reduce issues of attribution, no information is provided on additional explanatory variables included in the analysis.

The risk matrix identifies eight risks classified as Medium; all of them seem reasonable. It includes mitigating actions and compliance indicators.

RESULTS MATRIX

Project Objective:	Build resilience to coastal risks (including those associated with climate change) through sustainable coastal protection infrastructure, including natural infrastructure and integrated management of the coast.

EXPECTED IMPACT

Indicators	Unit of measure	Baseline	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	End of Project	Means of verification	Observations
IMPACT #1: Social resilience to coastal hazard events in New Providence, Eastern Grand Bahama, Central Long Island and Andros increased												
People injured, evacuated, relocated, with houses being damaged or destroyed, or requiring emergency assistance due to storms and floods over a three-year period.	People (#)	6,710	2014-2016							6,370 (2024-2026)	DesInventar	This is a lower-bound 2014-2016 estimate as it currently includes data from large-scale disasters only. It will be updated yearly through new DesInventar records as they become available
Economic losses caused by storms and floods over a three-year period.	USD millions of 2015	543	2014-2016							516 (2024-2026)	DesInventar	This is a lower-bound 2014-2016 estimate as it currently includes data from large-scale disasters only. It will be updated yearly through new DesInventar records as they become available

Indicators	Unit of measure	Baseline	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	End of Project	Means of verification	Observations
IMPACT #2: Environmental resilience to coastal hazard events in New Providence, Eastern Grand Bahama, Central Long Island and Andros maintained or increased												
People exposed to reduced coastal risk due to attenuation of waves, erosion and flooding by coral reefs, mangroves and seagrasses.	People (#)	4,610	2015							4,953	InVEST Coastal Vulnerability Model	Baseline is the share of people residing on Andros coastline where coastal habitats reduce risk in 2015. National estimates will be provided for both baseline and end of project years in the ex post impact evaluation
IMPACT #3: Economic resilience to coastal hazard events in New Providence increased												
Total cruise ship tourism expenditures in Nassau and Paradise Island	USD millions of 2015	1,109	2015							1,192	Department of Statistics, GOBH	

EXPECTED OUTCOMES

Indicators	Unit of Measure	Baseline Value	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	End of Project	Means of verification	Observations[2]
OUTCOME # 1: Component 1. Sustainable coastal protection infrastructure												
Terrestrial and marine protected areas with improved coastal zone management in EGB	Area (ha)	0	2017							48,764.62 (ha)	Data from The Bahamas National Trust (BNT)	The definition of this indicator is total terrestrial and marine area that is designated as a protected area and is managed systematically with effective measures by the government. See M&E plan for details
# of households with improved road access to Freeport due to flood reduction in EGB	Households (#)	0	2017							77	Data from the Department of Statistics (statistical office in Freeport)	See M&E plan for details
# of people visiting the beaches and harbor area in New Providence	Visitors (#)	3,266,353	2015							3,985,280	Data from The Bahamas Ministry of Tourism	See M&E plan and Economic Assessment Report for details
Households protected from flood risk (#) in Central Long Island	Households (#)	0	2017							328	Data from the Department of Statistics	See M&E plan for details

Indicators	Unit of Measure	Baseline Value	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	End of Project	Means of verification	Observations[2]
Outcome # 2: Component 2. Natural infrastructure for hazard resilience in Andros												
# of people in the local communities participating in the designing, monitoring and maintenance of the nature based solution	People (#)	0	2017							220	Community workshop reports	See M&E plan for details
Coastline where coastal risk is reduced based on the protection provided by natural habitat	Shoreline coverage (%)	71%	2015							71%	InVEST Coastal Vulnerability Model	Baseline is the share of Andros coastline where coastal habitats reduce risks from waves, flooding and erosion in 2015. National estimates will be provided for both baseline and end-of-project years in the ex-post impact evaluation
% of women participating in the designing, monitoring and maintenance of the nature based solution.	Women (%)	51%[1]	2016							61%	Community workshop reports	Gender tracking See M&E plan for the EOI value calculation used for this indicator
Amount of CO2 captured by restored mangrove	Volume (tons)	0	2017							28,800t CO2	Data (Mangrove restoration area) from BNT	See M&E plan for the CO2 calculation model used for this indicator
Beneficiaries of improved management and sustainable use of natural capital	People (#)	0	2017							9,221	Data from the Department of Statistics	See M&E plan for the EOI value calculation used for this indicator

[1] % of women that participated in the Andros Master Plan Consultations WSS in 2016. See OEL 8.

Indicators	Unit of Measure	Baseline Value	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	End of Project	Means of verification	Observations[2]
Outcome #3: Component 3. Institutional strengthening for coastal risk management												
Government agencies benefited by projects that strengthen technological and managerial tools to improve public service delivery (#)	Government agencies (#)	0	2017							1	Semiannual progress reports.	MOWUD as the government agency will be the target agency. "strengthen technological and managerial tools to improve public service delivery" refers to the accomplishment of: - Coastal Program Management Unit (CPU) in operation (output 3.1) - Costal Hazard monitoring in operation (output 3.2) - Sustainable finance study developed and approved (output 3.3) See M&E plan for details

OUTPUTS

Outputs	Unit of measure	Baseline Value	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	EOP	Means of verification	Observations[2]
Component # 1: Sustainable coastal protection infrastructure												
Output 1.1.1: Baseline study at East Grand Bahama completed	Studies (#)	0	2017		1					1	Semiannual progress reports	This baseline study will be used as an input for detailed infrastructure design (output 1.1.2) The Study will include: - Hydrodynamic studies - Ecological survey and Ecosystem services assessment - Environmental impact assessment
Output 1.1.2: Detailed infrastructure design at East Grand Bahama completed	Design work document (#)	0	2017		1					1	Semiannual progress reports	The design will include engineering design works (both hard and natural infrastructure) of the two-project sites shown in output 1.1.3. (mainly for nature based infrastructure) and another two project sites shown in output 1.1.4 (mainly for hard infrastructure)
Output 1.1.3: Coastal protection natural infrastructure at EGB implemented	Project sites (#)	0	2017			1	1			2	Semiannual progress reports	Removal of the causeway and replanting with relevant native species to restore hydrological flow at EGB. The project sites will include: - West Gap Creek and - Snapper Island Causeway

Outputs	Unit of measure	Baseline Value	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	EOP	Means of verification	Observations[2]
Output 1.1.4: Coastal protection (structural solutions) infrastructure at EGB implemented	Project sites (#)	0	2017			1	1			2	Semiannual progress reports	The project sites will include: - McLean's Town Causeway (installation of a new box culvert) - Ridge Creek (installation of a box culvert coupled with plantings and sills)
Output 1.2.1: Baseline study in New Providence completed	Studies (#)	0	2017		1					1	Semiannual progress reports	This baseline study will be used as an input for detailed infrastructure design (output 1.2.2) Specific project site will be Junkanoo Beach and Nassau Harbor Area. The study should Include: - Hydraulic modelling and hydrodynamic/ baseline surveys - Environmental impact assessment and cost benefit analysis
Output 1.2.2: Detailed Infrastructure design in New Providence completed	Design work Document (#)	0	2017		1					1	Semiannual progress reports	The design will include engineering design works in New Providence shown in output 1.2.3 and 1.2.4

Outputs	Unit of measure	Baseline Value	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	EOP	Means of verification	Observations[2]
Output 1.2.3: Coastal protection hard infrastructure in New Providence implemented	Types of Structure measures (#)	0	2017				2			2	Semiannual progress reports	Beach and dune stabilization measures in Junkanoo Beach, with: - Beach management through groyne structures - Repaired/upgraded drainage at West Bay Street
Output 1.2.4: Harbor protection measures in New Providence implemented	Structure measures (#)	0	2017					2		2	Semiannual progress reports	Arawak Cay and Nassau Harbor, with: - Upgrade of the Eastern Nassau Breakwaters - Upgrade of the Western Nassau Breakwaters
Output 1.3.1: Baseline study in Central Long Island completed	Studies (#)	0	2017		1					1	Semiannual progress reports	This baseline study will be used as an input for detailed infrastructure design (output 1.3.2) The study should include: - Hydrodynamic studies - Surge modeling - Environmental impact assessment and cost benefit analysis - Specific infrastructure designs
Output 1.3.2: Detailed infrastructure design in Central Long Island completed	Design work document (#)	0	2017		1					1	Semiannual progress reports	The design will include engineering design works in Central Long Island especially in the sites shown in output 1.3.3.

Outputs	Unit of measure	Baseline Value	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	EOP	Means of verification	Observations[2]
Output 1.3.3: Coastal flood reduction infrastructure in Central Long Island implemented	Project sites (#)	0	2017				2	4		4	Semiannual progress reports	Project sites will include: - Scrub Hill - Buckley - Deadman's Cay - Main Road (Gray's and Old Gray's)
Component # 2: Natural infrastructure for hazard resilience in Andros												
Output 2.1: Baseline study to inform selection of priority sites for demonstration projects in Andros completed	Studies (#)	0	2017		1					1	Semiannual progress reports	The study will include: - Shoreline vulnerability assessment - Ecosystem services assessment - Biophysical and socio economic suitability assessment
Output 2.2: Stakeholder validation workshops in each district executed	Workshops (#)	0	2017		4					4	Semiannual progress reports	Four districts are: (i) North Andros; (ii) Central Andros (iii) Mangrove Cay; and (iv) South Andros
Output 2.3: Site specific assessment for nature-based intervention completed	Assessment document (#)	0	2017		1	2	4			4	Semiannual progress reports	Four districts are: (i) North Andros; (ii) Central Andros;(iii) Mangrove Cay; and (iv) South Andros. Definition: baseline study diagnostics (hydrological patterns, genetic modification of natural environment, autecology) and management plan in each project site

Outputs	Unit of measure	Baseline Value	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	EOP	Means of verification	Observations[2]
Output 2.4: Coastal ecosystems restoration implemented	Area (ha)	0	2017		50	150	200			200	Semiannual progress reports	Four districts are: (i) North Andros; (ii) Central Andros (iii) Mangrove Cay; and (iv) South Andros. Minimal target area in each site will be 50ha. Ecosystem restoration efforts may include: (i) mangroves; (ii) invasive species (e.g., casuarina); and (iii) sand dunes and seagrass
Output 2.5: Communication and community participation plan for project sustainability completed	Planning document (#)	0	2017				1			1	Semiannual progress reports	Community awareness raising and replicable guidelines to inform future restoration efforts.
Component III: Institutional strengthening for coastal risk management												
Output 3.1: Coastal Program Management Unit (CPU) in operation	Accomplishment of milestone (#)	0	2017	1		2	4			6	Semiannual progress reports	"In operation" refers to the accomplishment of milestone 3.1.1 – 3.1.6

Outputs	Unit of measure	Baseline Value	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	EOP	Means of verification	Observations[2]
Milestone 3.1.1: # of technical member contracted for the CPU	People (#)	0	2017	5						5	Semiannual progress reports	The CPU will consist of 5 technical members that include: - Coastal Engineer - Assistant Engineers (two people) - Technician - Surveyor Contracted by MOWUD
Milestone 3.1.2: # of female technical resources of the CPU (desegregated by Milestone 3.1.1.)	People (#)	0	2017	1		2				3	Semiannual progress reports	Gender Tracking
Milestone 3.1.3: Strategic action plan for coastal risk reduction and climate change adaption approved	Strategic action plan (#)	0	2017			1				1	Semiannual progress reports	Approved by MOWUD
Milestone 3.1.4: Building codes with coastal infrastructure design guidance approved	Proposal document submitted (#)	0	2017				1			1	Semiannual progress reports	Approved by MOWUD and endorsed by the Project Advisory Committee (PAC)
Milestone 3.1.5: Shoreline management plans approved	Plans (#) approved	0	2017				2			2	Semiannual progress reports	In: - Nassau (New Providence) and - Long Island The plans will be approved by MOWUD and endorsed by the PAC

Outputs	Unit of measure	Baseline Value	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	EOP	Means of verification	Observations[2]
Milestone 3.1.6: Trainings implemented	Training curriculum developed and executed (#)	0	2017			1		3		5	Semiannual progress reports	Training curriculums include: - Coastal monitoring equipment operation - GIS operation; - Coastal solution modeling - Environmental assessment - Basic instruction for beginners
Output 3.2: Costal Hazard monitoring in operation	Accomplishment of milestone (#)	0	2017			2				3	Semiannual progress reports	"In operation" refers to the accomplishment of milestone 3.2.1 – 3.2.3
Milestone 3.2.1: Monitoring equipment and software installed and tested	Equipment and software (#)	0	2017		7	14				14	Semiannual progress reports	Equipment and software to be installed and tested. These include: - Digital mapping equipment - Acoustic Doppler current profiler (ADCP) - 2 tidal gages - 2 hydrometer monitoring stations - Drones - Nearshore survey equipment - 2 PCs - 4 coastal monitoring software. This equipment is the material necessary for trainings and further project formulation/ implementations
Milestone 3.2.2: Nearshore monitoring program approved	Program document (#)	0	2017				1			1	Semiannual progress reports	Associated by Met Office and approved by MOWUD

Outputs	Unit of measure	Baseline Value	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	EOP	Means of verification	Observations[2]
Milestone 3.2.3: Baseline study implemented and its results approved	Study result document (#)	0	2017			1				1	Semiannual progress reports	The study will include: - Data sets digitalization (meteorological data, aerial data, satellite image and topographic data) - Build on existing bathymetric data - Coastal Asset survey - Sediment resource study
Output 3.3: Sustainable finance study developed and approved	Study document (#)	0	2017					1		1	Semiannual progress reports	Approved by MOWUD Endorsed by the PAC

FIDUCIARY ARRANGEMENTS

Country:	The Bahamas
Project Number:	BH-L1043
Name:	Climate-Resilient Coastal Management and Infrastructure Program
Executing Agency (EA):	Ministry of Public Works (MOPW)
Prepared by:	Mario Castaneda (FMP/CBH) and René Herrera (FMP/CJA)

I. EXECUTIVE SUMMARY

1.1 The EA for this operation will be the MOPW. The Bank's methodology for Project Risk Assessment was used to identify the project's risks and to determine the corresponding mitigating measures. The Institutional Capacity Assessment System of MOPW prepared recently for the Airport Infrastructure Program (BH-L1041) was taken into consideration. Both assessments resulted in a medium fiduciary risk average level.

1.2 For the purposes of execution of the program, it has been agreed that a Program Implementation Unit (PIU) will be established within the MOPW, properly staffed with specialized fiduciary personnel. This PIU will maintain close coordination with the different stakeholders, and for this purpose, as a special condition, the loan will require the approval of a Manual of Operations to ensure clarity of roles, responsibilities and procedures applicable for program execution. IDB´s procurement policies and procedures will be applied.

II. EXECUTING AGENCY'S FIDUCIARY CONTEXT

2.1 The Constitution of The Bahamas is based on the Westminster Model and dates back to 1973. The Cabinet constitutes the executive branch and has general direction of the government. The Constitution authorizes the National Assembly to make laws by passing bills, including approval of government´s budget. In addition to its constitutional functions, the National Assembly has established a Public Accounts Committee to maintain oversight of the government's financial matters. The Constitution also states that there is an auditor general who is independent of both government and the National Assembly.

2.2 Public Financial Management is defined in the Financial Management and Audit Bill (2010 and 2013 amendment). The Bill outlines the functions of financial officials, budget administration, control over expenditures, bank accounts, accounts and audits, as well the external control exercised by the Auditor General. The fiscal year is inter-annual, going from July 1st to June 30th.

2.3 In 2010, the country initiated a reform of the national public procurement system, undertaken by the Ministry of Finance (MOF). This reform effort is still underway and the country's public procurement systems are not yet recommended for this program as of today. The MOF maintains a close oversight of project implementation by channeling all disbursement requests to the IDB and stays involved particularly in major issues regarding project implementation.

III. FIDUCIARY RISK EVALUATION AND MITIGATION ACTIONS

3.1 The results of applying the Risk Assessment Matrix for the fiduciary component after mitigation actions were considered of medium risk; also, the institutional capacity assessment resulted in a medium level rating. The analysis also considered the Methodology for Assessing Public Financial Management Performance (PEFA) scores for the Budget Cycle scores for accounting and external audit were particularly low. Therefore, the successful implementation of the program would require the hiring of appropriate specialized staff for the PIU.

3.2 A PIU will be established within the MOPW with specialized personnel, including a Financial Management and Procurement Specialists to ensure adequate fiduciary accountability and controls during program execution.

Table 1. Fiduciary risks and recommended mitigation actions

Risks/weakness	Action recommended	Compliance by
Delays in procurement due to limited experience applying IDB procurement policies and procedures and coordination between the two Ministries coordination. Determined as medium.	1. Selection of a Procurement Specialist under the PIU. The Bank will offer a progressive training plan to procurement staff in the PIU and explain acceptable bidding methods. This specialist will consolidate the overall procurement plan. Supervision of procurement will be conducted in ex ante modality.	Program startup date.
Delays in financial reporting due to limitations in personnel applying IDB financial management policies and procedures. Determined as medium. The delays in reporting relate to the inefficiencies observed in other programs in other government agencies in relation to the documentation process of the centralized accounting and treasury systems, which make it difficult to gather the information necessary to make payments, conduct documentary reviews and prepare disbursement requests.	2. Selection of a Financial Management Specialist under the PIU. The Bank will offer progressive financial management training for the PIU staff. The training will also incorporate financial planning. This specialist will consolidate all financial program information and reporting.	Program startup date.
	3. Still maintain the option for using Advances of Funds for disbursing loan resources, maintaining the 80% minimum justification requirement for the processing of new advances of funds to the program. However, if necessary during implementation, we will seek application of flexibility according to Financial Management Guidelines criteria to reduce the standard percentage (80%) of justification of funds required for new advances to a more manageable minimum.	During execution.
Also, the MOF has determined the Reimbursement of Expenses as their preferred method to access loan resources, which is already applied	4. The GOBH has been given the option to have the Office of the Auditor General to audit the program. Audited Financial Statements (AFS) must be presented to the Bank within	To be included in the loan contract.

Risks/weakness	Action recommended	Compliance by
to current portfolio. This approach may lead to inefficiencies that limit the ability to have accurate financial planning due to long treasury processing turnaround. These structural inefficiencies have also led to late presentation of audited financial statements in other programs as information for testing purposes is not readily available, even in those cases in which the audit has been performed by the Office of the Auditor General (OAG).	the 120 days following the closing of each fiscal year. If the option of using the OAG services is not applied, an Independent Audit Firm should be used.	
Lack of coordination Risk. Coordination between the MOPW and Bahamas National Trust will be critical for the implementation of Component 2.	5. Require the signature of an Execution Agreement or contract, whichever is applicable, so both parties have clarity of their roles and responsibilities and expected levels of coordination for the implementation of the program.	To be required in the loan contract
	6. A Program Operating Manual should also have sufficient details of roles, responsibilities, procedures of the organization for execution of the program.	To be required in the loan contract.

IV. ASPECTS TO BE CONSIDERED IN THE SPECIAL CONDITIONS OF CONTRACT

4.1 Based on the fiduciary risk evaluation and mitigation actions, the fiduciary arrangements that are recommended are the following:

a. **Special Contractual Clauses prior to the first disbursement of the financing**: All the precedent conditions related to the first disbursement are included in the Project Summary of the Loan Proposal.

V. FIDUCIARY ARRANGEMENTS FOR PROCUREMENT EXECUTION

5.1 Procurement for the proposed program will be carried out in accordance with the Policies for the Procurement of Works and Goods Financed by the Inter-American Development Bank (GN-2349-9) and the Policies for the Selection and Contracting of Consultants Financed by the Inter-American Development Bank (GN-2350-9), and with the provisions established in the loan contract and these procurement fiduciary arrangements.

a. **Procurement of Works, Goods and Non-Consulting Services.** The contracts for Works, Goods, and Non-Consulting Services[1] generated under the program and subject to International Competitive Bidding will be

[1] Policies for the Procurement of Goods and Works Financed by the IADB (GN-2349-9) paragraph 1.1: The services different to consulting services have a similar process as procurement of goods. The exchange rate considered was 1 US dollar = 1 BS dollars.

executed through the use of the Standard Bidding Documents (SBDs) issued by the Bank. The processes subject to National Competitive Bidding (NCB) will be executed through the use of bidding documents based on the above-mentioned standard documents and satisfactory to the Bank. The technical specifications review during the preparation of the selection process is the responsibility of the program sector specialist.

b. **Selection and Contracting of Consultants.** The consulting services contracts generated under this program will be selected and contracted using the Standard Request for Proposals issued by the Bank, when advertising at the international level and a document satisfactory to the Bank when advertising at the local level. The terms of reference review for the selection of consulting services is the responsibility of the program sector specialist. **Selection of Individual Consultants.** Contracts of individual consultants will be carried out using procedures per Section 5 of GN-2350-9. Posting of opportunities for individual consultant contracts may be advertised internationally or locally in order to attract qualified individuals.

c. **Training.** Training will be provided to the MOPW staff in charge of the financial management and procurement execution prior to starting activities and based on the Annual Operations Plan (AOP).

d. **Recurrent Expenses.** The program contains coverage of recurrent expenses that are required to start and maintain the program during execution and will be financed by the program within the annual budget approved by the Bank and Bahamas Financial Parameters. Among those identified there is funding for hiring consultants to assist the PIU in program management and supervision, monitoring and evaluation and contingent costs identified in the cost structure. These personnel are necessary to ensure proper staffing of the PIU to carry out the program activities, and are consistent with Country Financing Parameters.

f. **Retroactive Financing.** Not considered.

Table 2. Thresholds (US$)

International Competitive Bidding Threshold *		National Competitive Bidding Range ** (Complex Works and non-common goods)		Consulting Services
Works	**Goods**	**Works**	**Goods**	**International Short List**
≥3,000,000	≥150,000	150,000 – 3,000,000	50,000 -150,000	≥200,000

* When procuring simple works and common goods and their amount is under the International Competitive Bidding thresholds, shopping may be used.

** When procuring complex works and non-common goods with amounts under the NCB range, Shopping shall be used.

Note: The established threshold amounts for ex post review is applied based on the fiduciary capacity of the executing agency and can be modified by the Bank if the level of capacity varies. The complete procurement plan is available in REL-4.

VI. MAIN PROCUREMENT ACTIVITIES

6.1 The main procurement activities financed with this operation are listed below. One key procurement activity will be the single-source selection of The Bahamas National Trust (BNT) to implement the coastal habitat participatory restoration and monitoring activities in Component 1(a) and Component 2(a and b) as it is qualified and has experience of exceptional worth for the assignments, in accordance with GN-2350-9 ¶3.10(d).

Table 3. Main procurement activities

Activity	Procurement Method	Estimated Date	Estimated Amount 000'US$
Goods			
Procurement of Specialized Equipment for Field Services	ICB	3 Q 2018	470,000
Works			
Construction and rehabilitation of coastal infrastructure in Junkanoo Beach	ICB	3 Q 2018	13,568,000
Firms			
Bahamas National Trust	SSS	2 Q 2018	2,000,000
Individuals			
Experts for Project Implementation Unit	NIC	3 Q 2017	1,500,000

VII. PROCUREMENT SUPERVISION

7.1 The supervision method for procurement execution will be established ex ante until the procurement expert has gained experience observing and executing Bank policies, procedures, and use of standard bidding documents. The ex post modality may be recommended by the Procurement Specialist to the team leader in accordance to outcomes of supervision visits, if appropriate evidence is presented to demonstrate capacity to perform under the ex post supervision modality. Supervision visits will be performed every 12 months and as indicated in the program supervision plan. When ex post review is recommended, the supervision visits will be performed jointly with supervision visits.

VIII. SPECIAL STIPULATIONS

8.1 As indicated in Section IV.

IX. FINANCIAL MANAGEMENT

9.1 **Programming and Budget.** Each year during its budget call, the Budget Department of the MOF sends out its circular including the required forms to be completed. The information is completed by the various Ministries and forms are returned to the Budget Department. At this stage the Budget Department must key in all of the information it receives from the various ministries and departments to complete the Budget call. Once the budget has been approved, and the warrant

issued by the Minister of Finance, an interface is done by the IT department to upload the information to the Treasury's system.

9.2 The borrower has committed to allocate, for each fiscal year of program execution, adequate fiscal space to both ministries to guarantee the unfettered execution of the program; as determined by normal operative instruments such as the Annual Operations Plan (AOP), the Procurement Plan and Financial Plan.

9.3 **Accounting and Information Systems.** As the government accounting system does not provide sufficient details of program financial execution, it will be necessary to maintain auxiliary records at the PIU level, under the responsibility of a financial specialist, to fully comply with IDB requirements of internal control and records.

9.4 **Disbursements and Funds Flows.** The MOF has expressed their decision to use the Reimbursement of Expenses as their preferred method to disburse loan resources.

9.5 The option of using advances of funds on the basis of a financial plan will be maintained. For this purpose, the Treasury Department is in agreement to establish a Special Account at the Central Bank of The Bahamas, denominated in US Dollars in the event that MOF returns to using advances of funds. This account will have exclusive use to cover for program expenditures. Advances will be requested and deposited into this account on the basis of a financial plan.

9.6 The PIU commits to maintain strict control over the utilization of loan resources so as to ensure the easy verification and reconciliation of balances between the executing agency's records and IDB records (WLMS1 Summary Report). Other methods of disbursement such as direct payments will be considered on a case by case basis.

9.7 The program will provide adequate justification of the existing advance of funds balances, whenever at least 80% of said balance has been spent; if necessary, a lower percentage may be considered following the criteria established in the revised Financial Management Guidelines. When used, advances will normally cover a period not exceeding 180 days and no less than 90 days.

9.8 Supporting documentation for Justification of Advances and Reimbursement of Payments Made will be kept at the office of the PIU. Copies of the support documentation only in the case of direct payments will be sent to the Bank for processing. Disbursements' supporting documents may be reviewed by the Bank on an ex post basis. These reviews do not entail a blanket approval, based on the samples reviewed.

9.9 To request disbursements from the Bank, the EA will present the following forms and supporting documents:

Table 4. Type of Disbursement

Type of Disbursement	Mandatory Forms	Optional forms/ information that can be requested by the IDB
Advance	Disbursement Request/ Financial Plan	List of commitments physical/financial progress reports
Reimbursements of payments made	Disbursement Request/ program Execution Status/ Statement of Expenses	List of commitments physical/financial progress reports
Direct payment to supplier	Disbursement Request/ Acceptable Supporting Documentation may include invoices and acceptance of completion of works and/or delivery of goods and services to satisfaction of GOBH.	List of commitments physical/financial progress Reports/Evidence that goods/services have been satisfactorily received

9.10 **Internal Control and Audit.** The internal control capacity is estimated to be satisfactory. To the extent possible, the internal audit unit will provide oversight to the program.

9.11 **External Control and Reporting.** The government is given the option to use the services of the OAG to conduct the external control of the program. A private eligible audit firm will be in charge of the external audits if the use of the services of the OAG were not possible.

9.12 **Financial Supervision Plan.** Financial, Accounting and Institutional Inspection visits will be performed at least annually, covering the following: (i) review of the Reconciliation and supporting documentation for Advances and Justifications; (ii) compliance with financial and procurement procedures; (iii) review of compliance with the lending criteria; (iv) conducting ex post Review of Disbursements; and (v) follow up on audit work plan and audit recommendations. Financial Supervision will be developed based on the initial and subsequent risk assessments carried out for the program. To the extent possible, the Fiduciary Specialists will join administration missions and other project supervision activities.

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-__/17

Bahamas. Loan ____/OC-BH to the Commonwealth of The Bahamas
Climate-Resilient Coastal Management and Infrastructure Program

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Commonwealth of The Bahamas, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a climate-resilient coastal management and infrastructure program. Such financing will be for the amount of up to US$35,000,000 from the resources of the Bank's Ordinary Capital, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.

(Adopted on __ _____)

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