

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

BARBADOS

COASTAL RISK ASSESSMENT AND MANAGEMENT PROGRAM

(BA-L1014)

LOAN PROPOSAL

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ELECTRONIC LINKS	
REQUIRED	
1.	POA http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35382159
2.	Monitoring & Evaluation Arrangements http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35392202
3.	Impact Evaluation Plan http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35381712
4.	Environmental and Social Management Report - ESMR http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35379789
5.	Fiduciary Requirements and Agreements, and Detailed Procurement Plan http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35400230
OPTIONAL	
1.	Diagnostic of status of CZM in Barbados http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35380199
2.	System of Indicators for Disaster Risk Management http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35379996
3.	Analysis of project cost and economic viability http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35402281
4.	Institutional capacity evaluation of the CZM Unit http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35372359
5.	Risk Assessment http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35372339
6.	Final Evaluation of the Coastal Infrastructure Program (1386/OC-BA) http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35379134
7.	Component 2 - Designs http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35403967
8.	Terms of Reference http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35401227
9.	Safeguard Screening and Classification of Projects http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=35381265

ABBREVIATIONS

CCA	Climate Change Adaptation
CRM	Coastal Risk Management
CZM	Coastal Zone Management
DEM	Department of Emergency Management
DRM	Disaster Risk Management
ESMR	Environmental and Social Management Report
ESMP	Environmental and Social Management Plan
GHG	Greenhouse Gas
GDP	Gross Domestic Product
GRP	Risk Management in Projects with Sovereign Guarantee
GOBA	Government of Barbados
ICRM	Integrated Coastal Risk Management
LIDAR	Light Detection and Ranging
MEWD	Ministry of Environment and Water Resources & Drainage
NCRIPP	National Coastal Risk Information and Planning Platform
QA/QC	Quality Assessment and Quality Control
SEA	Strategic Environmental Assessment
SECI	Institutional Capacity Evaluation System
TCDPO	Town and Country Development Planning Office
UNFCCC	United Nations Framework Convention on Climate Change

PROJECT SUMMARY
BARBADOS
COASTAL RISK ASSESSMENT AND MANAGEMENT PROGRAM
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Financial Terms and Conditions			
Borrower: Government of Barbados Executing Agency: Ministry of Environment, Water Resources and Drainage through the Coastal Zone Management Unit		Amortization Period:	25 years
		Grace Period:	5 years
		Disbursement Period:	5 years
Source	Amount		
IDB (OC)	\$30 million	Supervision and Inspection Fee:	*
		Interest Rate:	LIBOR - based
Local	\$12 million	Credit Fee:	*
Total	\$42 million	Currency:	Single Currency Facility in US\$
Project at a Glance			
Project Objective/Description: The Coastal Risk Assessment and Management Program is aimed at building resilience to coastal hazards (including those associated with climate change) through enhanced conservation and management of the coastal zone. The program consists of the following components: (1) coastal risk assessment, monitoring and management; (2) coastal infrastructure; and (3) institutional sustainability for Integrated Coastal Risk Management			
Special contractual clauses: Special conditions prior to first disbursement. The Borrower shall present: (i) evidence that the Project Execution Team has been established with the Project Administration Section fully functioning and the key positions selected and hired (¶3.2); (ii) evidence that the Steering Committee has been formally established by Cabinet and its members appointed (¶3.4); and (iii) evidence that the Program Operating Manual has been officially approved by the Steering Committee in accordance with the terms previously agreed with the Bank, and is in force (¶3.6).			
Exceptions to Bank policies: None The project is consistent with Country Strategy : Yes [X] No []			
Project qualifies for: SEQ[] PTI[] Sector [] Geographic[] Headcount []			

(*) The credit fee and inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank's lending charges, in accordance with the applicable provision of the Bank's policy on lending rate methodology for ordinary capital loans. In no case will the credit fee exceed 0.75% or the inspection and supervision fee exceed, in a given six-month period, the amount that would result from applying 1% to the loan amount divided by the number of six-month periods included in the original disbursement period.

I. DESCRIPTION AND RESULTS MONITORING

A. Background

1. Coastal Risk in Barbados

- 1.1 The coastal zone¹ of Barbados is the country's main economic asset. Sandy beaches, fringing reefs and other coastal ecosystems distributed along 97 km of shoreline, relatively calm waters (on the Caribbean coast) and a warm tropical climate, create optimal conditions for a tourism industry that accounted directly and indirectly for 39% of Gross Domestic Product (GDP), 50% of total export earnings and 44% of employment in 2008. In addition, the coastal zone is central to the social and recreational lives of Barbadians, attracting more than one million person days at beach locations every year. Access to the coastal zone is also critical for other traditional uses such as fishing and maritime transport.
- 1.2 Due to its location, Barbados is moderately exposed to hurricanes and tropical storms and, resulting directly from these, storm surges and high winds, all of which have had a significant impact on the coastal zone. The country is also highly susceptible to coastal beach erosion along the west and south coasts and cliff instability along the east coast (Scotland District), either from specific storm events or from ongoing processes such as shoreline sediment transport and soil and rock slippage. In addition, low lying regions of the country, including those in the densely populated coastal zone, are often prone to inland flooding. This situation is compounded by a lack of permanent natural water courses and poor drainage infrastructure. Earthquake hazard is moderate and tsunami and drought hazard are low.
- 1.3 As more than 50% of Barbados' population of 276,000 and 95% of the tourism related physical plant and other critical infrastructure are concentrated in or near the coastal zone, coastal risk² is high. For example, a study on [Indicators of Disaster Risk and Risk Management](#) conducted by the Bank found that, for the year 2008, the probable maximum losses that Barbados could suffer as a result of a catastrophic (hurricane and earthquake) event with a return period of 100 years (10% probability of occurrence in ten years) amounted to US\$423 million, or

¹ The coastal zone management area for the Caribbean Coast is defined as: (a) landward - the first coastal through road which has traditionally been used as the boundary when considering coastal development applications or the limit of the 100 year storm surge flooding, whichever is further inland; and (b) seaward – the 100 meter isobath or 200 meters seaward of the outer edge of the bank reef, whichever is further seaward. (Draft Integrated Coastal Management Plan for the West and South Coasts. Government of Barbados 1999). For the Atlantic Coast, the landward boundary follows main roads near the coast and landscape features. The seaward boundary lies along the 100m depth contour which marks the shelf slope boundary which is 1- 2km offshore.

² In the context of this operation, coastal risk refers to the losses resulting from the occurrence of natural and anthropogenic hazards and disasters, including those associated with climate variability and climate change, in the coastal zone.

11% of GDP. The country also displays a moderate to high prevalent vulnerability, primarily related to a high exposure of its physical assets and population; and a moderate lack of resilience. Economic impacts from coastal zone degradation could include losses in land value to owners, tourist revenues and recreational opportunities for Barbadian beach users.

- 1.4 Improvements in coastal zone management can certainly contribute to the country's overall performance in disaster risk management. Barbados' Risk Management Index for 2008, a Bank risk indicator that measures this performance on a scale from 0 to 100 (maximum), suggests that disaster risk management is at a low average level of 44.6, slightly above other countries in the region for which the index is available. Performance in public policy areas of risk identification, risk reduction, disaster management, as well as governance and financial protection could be enhanced if disaster risk reduction is incorporated in the management of the coastal zone.
- 1.5 Climate change is affecting and has the potential to severely modify the climate risk profile of Barbados by altering the frequency and severity of existing coastal hazards as well as generating new hazards such as sea level rise; and increasing socioeconomic vulnerability. It is estimated that under a worst case scenario on Greenhouse Gas (GHG) emissions, additional annual expected GDP losses to Barbados from wind, inland flooding and coastal flooding attributed to climate change will be an additional 4% of total GDP by 2030 ([Caribbean Catastrophe Risk Insurance Facility, 2010](#)). In the context of the coastal zone, climate change has the potential to affect shoreline stability, the health of coastal and marine ecosystems, public infrastructure and private property in general. Coral bleaching, the intensification of beach erosion and encroachment of wetlands and lagoons associated with sea level rise could have serious implications for future development, recreational activities and land use in the coastal zone. This means that without the implementation of appropriate adaptation measures, climate change will likely threaten the physical and economic viability of the coastal zone.

2. Progress in Coastal Zone Management (CZM) and lessons learned

- 1.6 Beginning in 1983, the Government of Barbados (GOBA) embarked on a program to improve coastal zone management in an effort to safeguard the character of the coastline and protect significant infrastructure threatened by erosion and other coastal processes. Progress in managing the coastal zone has been achieved, in part, through Bank support. In 1994, the Bank approved the Coastal Conservation Program – Phase I (856/OC-BA, US\$3.6 million and CAN\$500,000 grant from the Canadian Trust Fund). Valuable data on shoreline and oceanographic dynamics were collected and analytical capabilities on processes in coastal environments were strengthened. The loan supported work towards the establishment of the Barbados CZM Unit in 1996, passage of the CZM Act of 1998, and a draft National CZM Plan which provides development guidelines and management actions for each coastal segment. The project was one

of the first to develop an integrated coastal zone management program for a developing country.

- 1.7 Building on this experience, the Bank provided further support in 2002 through the Coastal Infrastructure Program (1386/OC-BA, US\$17 million). The loan, which was executed by the CZM Unit, was fully disbursed as of December 2009 and its [final evaluation](#) was completed in July 2010. The program has resulted in effective erosion control and beach stabilization at popular locations along the West Coast and significant improvements in public coastal access along 4.5 km of shoreline. The improvements were designed on the basis of the best available scientific information, advanced modeling and the use of high quality materials, thus meeting the highest international engineering and design standards and reducing long-term maintenance costs. The investments are currently being maintained with government funds. The Bank's support to date has resulted in the establishment of one of the most comprehensive coastal and marine management programs in the Caribbean.
- 1.8 Progress to date has yielded important lessons for the sector's future including: (i) to be effective, CZM must combine regulatory and institutional reforms with the collection and analysis of up-to-date scientific data on coastal ecosystems and their services (erosion and sediment control); (ii) investments in coastal engineering infrastructure must be accompanied by continued improvements in the technical understanding of coastal processes and all coastal risks (including those associated with climate variability and climate change), particularly since the designs themselves can have impacts on processes in adjacent shoreline areas; (iii) a rigorous stakeholder consultation process is essential and should involve one-on-one visits to affected property owners as well as public meetings to obtain input to finalize the designs and subsequently during construction to inform the affected public of progress and to provide a forum for the discussion of and resolution of issues; and (iv) a coordination mechanism involving decision makers should be in place during execution of programs to streamline the processes required to initiate works.
- 1.9 In its First National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) (2001), the GOBA recognized that one of the most serious challenges the country faces as a result of changing climate is sea level rise and its principal impacts (coastal erosion, inundation and saltwater intrusion) are expected to be felt mostly on the northwest, west and southwest coasts. The National Communication also identifies the National CZM Plan as a key policy instrument that could provide guidance for climate change adaptation. In addition, the draft National Climate Change Adaptation Policy Framework and Abatement Plan identifies the strengthening of the CZM Unit as an important asset in addressing the impacts of climate change on coastal resources.
- 1.10 Against this background of emerging climate risk, and recognizing that climate change has a number of implications for disaster risk reduction and management,

the GOBA considers it both prudent and timely to adopt an integrated coastal risk management approach, expanding the CZM mandate as a necessary strategy for sustainable development. This approach incorporates risk management solutions into CZM that address current and future vulnerabilities as well as reflect changes in environmental and socio-economic conditions over time³.

3. Challenges for Coastal Risk Management

1.11 While significant advances have been made in integrated CZM, the following challenges limit Barbados's ability to systematically manage coastal risk in the face of a changing climate. These include the following areas:

- a. Risk assessment, monitoring and management. The CZM Unit currently has some capacity in coastal erosion and storm surge monitoring, data analysis and modeling; however the existing programs are limited in terms of the range of data characteristics monitored, as well as in area coverage. In addition, the CZM Unit lacks: (a) an adequate knowledge base on the types and magnitude of the natural and anthropogenic hazards that affect the coastal zone, exposed asset inventories and vulnerability, and potential losses; and (b) capacity in hazard risk assessment. The CZM Unit needs to expand its existing program for coastal monitoring and data collection, as well as to develop new initiatives for natural hazard and climate risk data collection, assessment, monitoring and management, including baselines studies. Moreover, so as to facilitate an integrated and harmonized approach to risk-based decision making in the coastal zone, the CZM Unit must lead the development, implementation and sustained use of an integrated coastal risk information and planning platform, that will (i) also be accessible to key strategic partners⁴ and (ii) utilize standardized risk evaluation and communication methodologies and tools, supported by appropriate protocols for data sharing.
- b. Shoreline stability, hazard resilience and access in critical areas. In addition to limiting public access, high density development along the West and South Coasts results in severe erosion and an overall reduction in beach width which affects recreational use along the coast and threatens public and private infrastructure. Beach erosion rates of -0.8m/year have been recorded at various locations along the West Coast. Previous studies have shown that approximately 70% of Barbados households visit beaches during the peak season⁵, thus providing evidence of the potential impact of beach erosion on resident recreational use. In addition, deteriorating water quality associated

³ Draft climate change adaptation and abatement policy, 2010. Government of Barbados.

⁴ Town and Country Development Planning Office (TCDPO), Department of Emergency Management (DEM), Ministry of Environment, Water Resources and Drainage through its Policy, Planning and Research Unit, Environmental Protection Division and Drainage Division; and Soil Conservation Unit.

⁵ Strand, I. 2000. Modeling demand for and economic value of beaches and their characteristics: residential use in Barbados. Unpublished manuscript provided by author.

with effluent discharges in nearshore waters has resulted in significant mortality rates in coral reefs which provide a natural barrier against wave erosion and produce sand that nourishes beaches. Estimates indicate that over 80% of Barbados' fringing reefs are deteriorated. Since shoreline restoration through natural sand production is a slow process, the solution to shoreline instability in the short to medium term is the construction of shoreline stabilization structures that are sustainable and hazard resilient. This can be combined with an ecosystem-based approach to climate change adaptation for a longer term response whereby the natural processes supported by reefs, dunes and other ecosystems are managed to increase resilience to climate change impacts.

- c. Policy and institutional framework for Integrated Coastal Risk Management (ICRM). In order to more effectively manage identified hazard risk in the coastal zone, Coastal Risk management (CRM) must be mainstreamed into development decision making at the national and sectoral levels. While GOBA has endorsed comprehensive disaster management and Climate Change Adaptation (CCA), and CZM has been mainstreamed into national development planning, there is a need to apply CRM in a practical manner in day-to-day decisions and operations throughout the network of institutions implementing sector development policies and plans, enforcing regulations and managing resources in the coastal zone, thus contributing to building resilience to risk in tangible ways. Although there has been a draft CZM Plan since 1999, it has not been approved by Cabinet, nor have the subsidiary regulations been passed to support the enforcement of the requirements of the Coastal Zone Management Act (e.g. delimiting the CZM areas, harmonizing CZM and coastal development, and establishing clear flow of information). Also, the planning assessment process, led by the Chief Town Planner, lacks efficient flow of information on final decisions on development applications. Apart from its legislative base, addressing these challenges will require expanding capacity within the CZM Unit to integrate disaster risk management DRM and CCA into its activities, strengthening institutional collaboration between the CZM Unit and its public sector strategic partners, and expanding stakeholder participation and education.

4. Program concept strategy

- 1.12 The Program is framed within the context of an integrated risk-based approach to coastal zone management, which promotes the proactive management of coastal risk for improved coastal conservation and management. This approach includes: (i) risk analysis, in order to strengthen the knowledge base on the types and magnitude of potential climate-related and other hazard impacts that affect population and assets in the coastal zone; and (ii) prevention and mitigation, in order to reduce vulnerability, including through: (a) hazard-resilient design and construction of coastal infrastructure; (b) institutional strengthening through the mainstreaming of disaster risk management and climate change adaptation into development decision making in the coastal zone. The approach builds on the

significant advances made to date by the CZM Unit in managing key coastal processes such as erosion while engaging in the necessary shift to develop and enhance the information and adaptation strategies for other coastal hazards such as wind, storm surge and coastal flooding; inland flooding, tsunamis, and coastal cliff instability (landslide and subsidence).

- 1.13 Within this context, the Program's strategy consists of three inter-related lines of action, each one providing a response to the challenges identified for CZM (§1.11). First, the scope of and access to coastal risk information and risk assessment methodologies and tools will be expanded for use by the CZM Unit as well as its strategic partners responsible for development planning, DRM and CCA and for implementation of the CZM plan. Second, climate and other hazard resilient infrastructure (combined with ecosystem-based adaptation measures) will be built using designs that incorporate the improved coastal risk information with a view to controlling erosion, flooding and other hazard impacts, and improving access. Locations for the infrastructure were selected from a set of national priorities established on the basis of technical, economic, social and environmental criteria. Third, policies and regulations related to CZM will be updated to incorporate an integrated coastal risk management approach. This will be combined with strengthening of the CZM Unit and its strategic partners to enable them to implement the expanded risk-based approach more effectively.
- 1.14 **Country Strategy.** The proposed program supports the Country Strategy (2009-2013) (GN-2539) in that it contributes one of the four country development goals of the Strategy, namely building resilience to coastal risks, natural disasters and climate change. The program's results and output indicators are also consistent with the indicators included in the Strategy, such as improved risk data and tools, extent of beaches stabilized and mainstreaming of disaster risk management and climate change adaptation in policies and the CZM Plan. Finally, the program contributes to GCI-9, specifically to one of the Bank's institutional priorities to protect the environment and respond to climate change by aiming to build resilience to coastal hazards and climate-related risks in the coastal zone.

B. Objective, components and cost

- 1.15 The Coastal Risk Assessment and Management Program is aimed at building resilience to coastal hazards (including those associated with climate change) through enhanced conservation and management of the coastal zone. The program's overall objective is to build capacity in integrated coastal risk management in Barbados incorporating disaster risk reduction and climate change adaptation in development planning, control and monitoring of the coastal zone.

1. Component 1. Coastal risk assessment, monitoring and management (US\$15.3 million)

- 1.16 This component will provide updated and new qualitative and quantitative data on coastal risk, and state-of-the-art tools for the systematic, routine and efficient use

of quantitative risk information in development decision making, including its assessment, updating, monitoring and management. This will be done with a view to mainstream DRM and CCA in development planning as well as to inform the design of hazard-resilient shoreline infrastructure. The component will finance the following activities:

- a. Baseline studies of coastal and oceanographic processes: The following studies will be conducted: nearshore wave climate, coastal zone (Light Detection and Ranging) LIDAR survey, shoreline change; water quality, circulation and sedimentation; geotechnical surveys and investigations; and sediment transport. The studies will also result in technological improvements in the permanent coastal monitoring activities administered by the CZM Unit;
- b. A comprehensive risk evaluation, involving; (i) hazard identification, historical review and probabilistic analysis; (ii) preparation of an inventory and categorization of elements exposed and vulnerability analysis; (iii) risk assessment; (iv) preparation of high resolution hazard and risk maps; and (v) training workshops. The following hazards will be assessed: wind and earthquakes, for the entire country; and storm surge, sea level rise, coastal erosion, tsunamis, inland floods, coastal cliff instability (landslides and subsidence) and oil spills for the coastal zone. The risk evaluation will incorporate an assessment of the period of return and/or change of severity of the climate related impacts at the local level;
- c. Update of the System of Indicators of Disaster Risk and Risk Management for Barbados. This will consist of (i) the application of the four indicators Disaster Deficit Index, Local Disaster Index (including development of the DesInventar database), Prevalent Vulnerability Index and Risk Management Index, updated to 2012 and 2014, and training workshops. The Indicators will incorporate climate change risk management; and (ii) development of a financial risk management strategy;
- d. The design and implementation of a National Coastal Risk Information and Planning Platform (NCRIPP). The platform will be based on a geographic information system and will involve the following activities: (a) platform design, including the design of a long term monitoring system; (b) development of data standards; (c) database integration; (d) development of sector-specific applications for risk-based decision making; and (e) training workshops.

2. Component 2. Coastal infrastructure (US\$20.1 million)

- 1.17 This component aims to control shoreline erosion, improve resilience of coastal infrastructure to climate change and other hazards and improve public access to beaches, thereby avoiding damages to shorefront properties and public infrastructure and enhancing the recreational opportunities offered to tourists and

residents. The component includes construction of hazard-resilient shoreline access and stabilization works designed during the Coastal Infrastructure Program (1386/OC-BA), with the following projects having been selected as priorities: (i) the Holetown Waterfront Improvement Project (Holetown to Heron Bay) along the West Coast which consists of: (a) the construction of coastal revetments, offshore breakwaters, groynes and beach nourishment as well as shoreline enhancement structures (walkways) extending over approximately 1.5 km; and (b) the restoration of the Holetown Lagoon to improve water quality and reduce flooding using a system (fluidizer) to improve water exchange between the lagoon and the ocean; and (ii) improvements to a vessel haul-out area at Tent Bay along the East Coast for approximately 20 fishers currently keeping their boats and utilizing the nearby fish market, with a view to improving vessel safety and local commercial opportunities. Also included are resources to finance extensive stakeholder engagement and conflict management processes prior and during construction.

- 1.18 In addition, the component will finance the design and feasibility analysis of new infrastructure projects selected on the basis of technical, environmental and socioeconomic criteria, including the Rockley Beach to St. Lawrence Gap Waterfront Improvement Project aimed at providing long-term shoreline protection and enhancing the recreational value of beach areas over approximately 1.4 km of coast. Finally, the component will finance demonstration measures for an ecosystem-based approach to climate change adaptation (e.g., non-structural beach stabilization measures, management measures such as zoning and technology for enhanced reef recovery, dune stabilization, and the management of wetlands functioning as buffers for erosion).

3. Component 3: Institutional sustainability for the Integrated Coastal Risk Management (ICRM) (US\$3.8 million)

- 1.19 This cross-cutting component aims at establishing the conditions needed for long term sustainability of the actions and investments carried out under the program. It will create the enabling policy and regulatory environment; improve the corresponding institutional capacity to meet the needs for an expanded mandate and promote the effective participation of all stakeholders in Barbados to implement an integrated coastal risk management approach. The component will finance activities in three areas: (i) Policy, regulatory environment: update and approval of the integrated CZM plan incorporating DRM and CCA; preparation of regulations under the integrated CZM plan; development of two strategies and action plans for coastal climate change adaptation and for disaster risk reduction; tools for implementing cost recovery mechanism for coastal infrastructure; (ii) Institutional capacity building: training in enforcement for coastal zone inspectors; technical support and training for CZM Unit in risk modeling and assessment, data management; and design and use of risk evaluation and communication tools to support future enhancement of the NCRIPP; and (iii) Stakeholder communication and education: sensitization in DRM, CCA and integrated CZM for management and technical personnel of CZM Unit and

strategic partners; development of a Policy for information sharing; and design and implementation of a communication strategy (including public education and awareness campaign on disaster risk).

C. Key results indicators

- 1.20 The main benefits of the program are associated with the reduction in hazard damage and losses resulting from the implementation of an integrated coastal risk management approach. In this context, the Risk Management Index is a key indicator for the results attributable to the program in the sense that it measures performance of the country in risk management in terms of the four public policy areas of risk identification, risk reduction, disaster management, governance and financial protection. The indicators are specified in the Results Matrix in Annex II.

D. Technical and economic viability

- 1.21 Studies for preparing the program were financed by a technical cooperation (ATN/MD-12057-BA) under the supervision of the CZM Unit and the Bank. The [engineering designs](#) of the structures are based on in-depth field investigation of coastal and oceanographic conditions, physical and numerical modeling of alternatives, and high quality materials selected to minimize maintenance costs. In addition to the [diagnostic of the current situation](#), the technical studies included: needs assessments, the review and validation of available engineering designs, detailed budget and [terms of reference](#) for all three components, the economic and institutional analysis, a Strategic Environmental Assessment and a draft of the Program Operating Manual.
- 1.22 A formal cost-benefit analysis was conducted for the program⁶ as whole using a 12% discount rate and a 50-year time horizon⁷. The basis for assessing the net economic benefits of the program were the marginal deviation from the expected damages in the baseline scenario (without the program) compared to the expected damages in alternative scenario (with the program). Conceptually, the incremental economic benefits are the reduction in climate and non-climate related damages, including: (i) avoided damage to tourism demand resulting from improvements in beach quality and capacity to handle well natural disasters; (ii) avoided damages to amenities (ecosystem services and recreational values) related to coastal risk management that accrue to the local population; (iii) avoided damages from storm events – value of lost buildings and infrastructure; and (iv) benefits of coastal risk management that are capitalized into the price of coastal properties. Due to the lack of data, we have considered only the benefits associated with the avoided damages to the demand for tourism, as a result of improved beach quality, and

⁶ In addition, cost-benefit analysis of the individual coastal infrastructure projects will be done prior to their implementation.

⁷ The time frame of 50 years was selected because forecasting climate change impact on an economy becomes very uncertain beyond this period.

avoided damages from storm events, including those resulting from improved building codes, setbacks and other development decisions. The costs of the program include the upfront investments, operation and maintenance costs, and any additional costs that must be borne to make this adaptation to climate change happen.

- 1.23 In our most conservative scenario, the results of the cost-benefit analysis shows that the net present value of the program is \$36.4 million (s.d. = \$4.1 million) and internal rate of return of 21% (s.d. = 1.2%). The detailed methodology and sensitivity analysis⁸ are detailed in the annex of [economic evaluation of the program](#).

II. FINANCING STRUCTURE AND MAIN RISKS

A. Cost and financing instrument

- 2.1 Total program cost is US\$42.0 million, with US\$30.0 million financed by the Bank's Ordinary Capital (71%) and US\$12.0 million by local counterpart (29%). Local counterpart funds will finance, among other items, incremental staff, materials and Value Added Tax on works, goods and related services, and consulting services procured under the program. Table I-1 shows the distribution of cost by component and funding source. Detailed cost information is available in the technical files:

Table II 1: Total Program Cost (US\$ Millions)

	IDB	Local	Total	%
I. Program Administration		2.2	2.2	5.2%
II. Direct Costs	29.4	9.8	39.2	93.0%
2.1 Coastal risk assessment, monitoring and mgt	13.5	1.8	15.3	
2.2 Coastal infrastructure	12.5	7.6	20.1	
2.3 Institutional sustainability for ICRM	3.4	0.4	3.8	
III. Monitoring, Evaluation, Audits	0.6		0.6	1.4%
IV. Financial Costs *				
Total	30.0	12.0	42.0	100
Percentage	71	29	100	

* Financial costs will be paid by the Borrower outside program financing.

- 2.2 The operation is structured as an investment loan to be disbursed according to the timetable below.

Table II-2: Disbursement Schedule (US\$ Million)

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Total
IDB	3	4.5	7.5	9	6	30
Local	1.2	1.8	3.0	3.6	2.4	12
Total	4.2	6.3	10.5	12.6	8.4	42
%	10	15	25	30	20	100

⁸ For calculation purposes, the baseline of the program is the path into the future in terms of damages that will occur without investments to make the coastal zone resilient to climate change and natural disaster. The alternative scenarios are the increased coastal resilience that the program will provide to the government, individuals, and firms to reduce damage from climate change and natural disaster.

B. Environmental and social safeguard risks

- 2.3 The operation was classified as “B” in accordance with the Environmental and Social Safeguards Compliance Policy (OP-703). Accordingly, during preparation of the proposed program a Strategic Environmental Assessment was developed by the GOBA with the purpose of analyzing the potential impacts of the overall program. Also a preliminary environmental and social management plan was developed as part of the Strategic Environmental Assessment (SEA) initiative. The final Environmental and Social Management Plan (ESMP) will be prepared and incorporated into the Program Operating Manual, establishing guidelines and procedures for the identification, analysis, mitigation of impacts associated with categories of future shoreline stabilization projects. The CZM Unit applies comprehensive specifications on environmental, social, health and safety and labor requirements as part of the tender documents for construction and supervision of the coastal infrastructure interventions, which will be incorporated as standard operating procedures in the Program Operating Manual as requirement for all investments that comprise Component 2. In addition, specific environmental analyses of each of the works were completed or are being undertaken in accordance with national legislation and consistent with Bank policies. Indicators of environmental performance of the structures will be selected and included as part of the long-term risk monitoring system. During project preparation, a series of consultations were carried out with property owners and other relevant stakeholders, which contributed to the Program’s design. The [Environmental and Social Management Report \(ESMR\)](#) summarizes the findings in terms of strategic and project specific impacts, institutional capacity and recommended measures to address potential impacts and risks, consistent with the IDB policies (OP-703; OP-704; OP-102).

C. Fiduciary risk

- 2.4 An [institutional evaluation](#) of the Ministry of Environment, Water Resources and Drainage and the CZM Unit was conducted through the application of the Institutional Capacity Evaluation System (SECI as per its Spanish acronym) methodology. The results of the SECI determined a satisfactory level of development and an associated moderate risk level for the CZM Unit. In addition, as part of the preparation of the loan, the [risk assessment](#) of the program was undertaken using the methodology for Risk Management in Projects with Sovereign Guarantee (GRP). The results show moderate risk levels, mainly associated with financial administration. The analysis shows that the CZM Unit has been able to acquire ample experience through the execution of the loan 1386/OC-BA and, in particular, with respect to Bank requirements on procurement, accounting, financial administration and reporting, among others. Notwithstanding the foregoing, the CZM Unit will be strengthened through the following actions: (a) the Project Executing Team will be strengthened with additional personnel; (b) the CZM Unit’s operational manual and regulations will be developed; and (c) the CZM Unit and the Project Executing Team will be trained in project planning, monitoring and financial management, procurement and the application of the operational systems.

- 2.5 **Financial Audits.** The CZM Unit shall present the program's audited financial statements within 120 days after the end of each fiscal year and at the end within 120 of final disbursement. An external audit will be performed by a firm of independent auditors acceptable to the Bank, in accordance with the requirements set out in documents OP-273-1 ("Financial Management Policy for IDB-Financed projects") and terms of reference previously approved by the Bank.

D. Other key issues and risks

- 2.6 Inter-institutional coordination and the sustainability of coastal stabilization structures were two issues examined during project preparation. In the case of coordination, the program will build a formal mechanism and develop an information sharing policy and protocols enabling the CZM Unit to work closely with strategic partners. In the case of the sustainability of the works, the program will finance tools for the implementation of cost recovery mechanisms.

III. IMPLEMENTATION AND MANAGEMENT PLAN

A. Summary implementation arrangements

1. Execution plan

- 3.1 The Borrower for this operation will be the Government of Barbados. The Executing Agency will be the Ministry of Environment, Water Resources and Drainage through the Coastal Zone Management Unit, which will have full responsibility for overall program management, supervision and evaluation.
- 3.2 **Program execution and administration.** To fulfill its responsibilities, the CZM Unit will receive the support of a Project Executing Team to be organized into two sections (Administration and Technical). The Project Administration Section will be staffed by the following key positions: a Project Manager, Deputy Project Manager, Accounts Clerk, Project Engineer and Coastal Information Systems Manager to be financed as civil servant employees by the Government as well as a Procurement Specialist to be financed by the program as a consultant. The Project Administration Section's duties will include: (i) preparing required project reports; (ii) monitoring product, output and outcomes achievement using established indicators; (iii) preparing and submitting disbursement requests to the Bank and justification of expenses; (iv) preparing annual financial program expenses; (v) ensuring compliance with all aspects of the Program Operating Manual; and (vi) maintaining adequate documentation filing system. **Evidence of the establishment of the Project Executing Team with the Project Administration Section fully functioning with the key positions selected and hired will be a condition prior to first disbursement.**
- 3.3 The Technical Section of the Project Executing Team will be staffed with a Marine Biologist, two Research Officers, two Data Entry officers, a Surveyor and a Draftsman. Their duties will be to serve as incremental technical counterpart for

the execution of the program's three components with a view that the positions would eventually be absorbed in the permanent structure of the CZM Unit.

- 3.4 To ensure coordination among government agencies, a Steering Committee will oversee and guide the implementation of this operation. This committee will consist of public sector professionals with decision making authority and be led by the Permanent Secretary of MEWD. In addition to the Project Manager, other members include representatives from the Public Investment Unit, TCDPO, Policy, Planning and Research Unit, Environmental Protection Division and Drainage Division of Ministry of Environment and Water Resources & Drainage (MEWD), DEM and Ministry of Tourism. The committee will have responsibility for: (i) overseeing the overall planning and implementation of the program; (ii) approval of periodic consultants reports and evaluations; (iii) review proposed changes in program objectives, strategies or components, for approval by the Minister and submission to the Bank; (iv) establish sub-committees, as necessary, to give guidance on specific technical areas, and review their recommendations; (v) review and approve the progress reports prepared by the Project Executing Team. **Evidence that the Steering Committee has been formally established by Cabinet and its members appointed will be a condition prior to the first disbursement.**
- 3.5 A Quality Assessment and Quality Control (QA/QC) firm or consortium with demonstrated experience and internationally recognized expertise in the field of coastal risk assessment and management, disaster risk management and climate change adaptation in the coastal zone will be hired to support the CZM Unit and the Steering Committee in the technical peer review of the products of the program. The QA/QC firm or consortium will have responsibility for: (i) providing an independent peer technical review of consultant proposals, interim and final products; and (ii) advising the CZM Unit in the resolution of highly specialized technical issues encountered during the execution of the program's three components.

2. Program operating manual

- 3.6 The Program Operating Manual establishes rules and procedures for the executing agency in terms of programming activities, financial and accounting management, procurement, audits, and program monitoring and evaluation. In addition, the Program Operating Manual establishes the criteria for selecting new sites for which designs for coastal infrastructure can be financed by the Program. **Evidence that the Program Operating Manual has been officially approved by the Steering Committee, in accordance with the terms previously agreed with the Bank and in force, will be a condition prior to first disbursement.**

3. Procurement

- 3.7 Procurements 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-2349-7), of July 2006; and the Policies for the Selection and Contracting of Consultants Financed by the Inter-American Development Bank (GN-2350-7), of July 2006, as well as with the provisions established in the loan contract and this procurement plan. In addition, the attached Fiduciary Arrangements Annex, details the procurement execution and supervision mechanism appropriate to the country fiduciary context.

4. Summary of arrangements for monitoring results

- 3.8 **Monitoring.** The CZM Unit will submit semiannual progress reports to the Bank, within 60 days after the end of each six-month period during program execution. Reports will focus on the fulfillment of output indicators and progress towards achieving the outcomes proposed in the Results Framework; they will also analyze the problems encountered and propose corrective measures. The reports in the second half of the year will also contain the annual work plan for the following calendar year, together with a forecast of disbursements and an updated Procurement Plan. Adjustments to the program arising from the discussion of these reports will be agreed upon with the Bank in the semiannual meetings with the CZM Unit.
- 3.9 **Evaluation.** As part of program evaluation, the CZM Unit will submit to the Bank a preliminary review 18 months after the loan contract becomes effective; a midterm review within 90 days after the date on which 50% of the loan proceeds have been committed; and a final evaluation report 90 days after the date on which 90% has been disbursed. These reports will include: (i) analysis of the program's financial execution, by component and financing source; (ii) progress in achieving the outputs, outcomes and impacts in the Results Framework, and the results of a comparative analysis against the program baseline; (iii) effectiveness in applying the program Operating Manual; (iv) the degree of fulfillment and the effectiveness of environmental control and protection measures; (v) the degree of fulfillment of contractual commitments; and (vi) a summary of the audit reports on the program's financial statements, procurement processes, disbursement requests, and internal control systems. The final evaluation report will include, as well, the results of measuring the program's impact, based on the system of indicators of Disaster Risk Management developed by the Bank, in accordance with the agreed [Impact Evaluation Plan](#).
- 3.10 The program provides funding for the planned evaluations. These evaluations will be performed independently by specialists in coastal risk management who will be contracted by the executing agency and financed from the loan. The reports, including supporting documentation and statistical data, will be kept available for use should the borrower or the Bank decide to conduct an ex post evaluation after the end of the program. The program includes funding for strengthening the CZM Unit's monitoring activities and for updating the System of Indicators of Disaster Risk and Risk Management.

Development Effectiveness Matrix
Summary

Indicator	Score	Maximum Score
I. Strategic Relevance	Low-High	
1. IDB Strategic Development Objectives	4.5	10
Country Diversification	2.0	2
Corporate Initiatives	2.5	2.5
Harmonization and Alignment	0.0	3.5
Beneficiary Target Population	0.0	2
2. Country Strategy Development Objectives	9.6	10
Country Strategy Sector Diagnosis	6.0	6
Country Strategy sector objective & indicator	3.6	4
II. Development Outcomes - Evaluability	Highly Satisfactory	
3. Evidence-based Assessment & Solution	10.0	10
4. Evaluation & Monitoring Plan	5.6	10
5. Cost-Benefit or Cost-Effectiveness	10.0	10
6. Risks & Mitigation Monitoring Matrix	10.0	10
III. IDB's Role - Additionality		
7. Additionality	10.0	10
Technical Assistance provided prior the project	3.0	3
Improvements in management of financial, procurement, monitoring or statistics internal controls	4.0	4
Improvements in environmental, health and labor performance	3.0	3

I. Strategic Relevance: This operation is implemented in Barbados, a group C country in the Caribbean. The program improves risk management in coastal areas, including risks associated with climate change and therefore is aligned with the Bank's corporate initiative on climate change. The Country Strategy includes Coastal Zone Management as a priority area and includes a diagnosis of the sector. The program is aligned with the Country Strategy objectives with respect to Coastal Zone Management.

II. Evaluability: The program has a good diagnosis which identifies main deficiencies and their magnitudes. Impact, outcome and output indicators are provided and there is a monitoring and evaluation plan which uses a reflexive methodology. The evaluation plan discusses the challenges in conducting evaluations of coastal zone management projects and provides a motivation for the chosen approach. There is a cost-benefit analysis that uses the available data to calculate the benefits of the program and provides a reasonable estimate of its returns.

III. Additionality: The program is expected to improve the coastal zone management through strengthening the capacity of the government to plan using a risk management framework. The program is also expected to strengthen the environmental review process.

RESULTS MATRIX: BA-L1014 - COASTAL RISK ASSESSMENT AND MANAGEMENT PROGRAM

PROGRAM OBJECTIVE	Build resilience to coastal risk (including those associated with coastal hazards natural disasters and climate change) through enhanced conservation and management of the coastal zone							
Expected Impacts of the Project	Base Line	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5	Target (end of programme)	Comments and Verification
PO.1 Increase in risk management performance as measured by the Risk Management Index (RMI) ¹ .	RMI = 44.62 (2008)					RMI = 50	RMI = 50	System of Indicators of Disaster Risk and Risk Management

¹ The Risk Management Index, one of the IDB Indicators of Disaster Risk and Risk Management, measures performance in risk management in terms of the four public policy areas of disaster risk management viz. risk identification, risk reduction, disaster management; and governance and financial protection. It ranges from 0 to 100. A detailed methodology for the determination of the RMI is presented in the impact evaluation plan.

Component 1: Coastal risk assessment, monitoring and management

Expected Outcomes C1	Base Line	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5	Total End of Programme	Comments and Verification
OC1: % increase in building development applications reviewed by the CZMU using a systematic, objective assessment of risk based on the national coastal risk information and planning platform NCRIPP	0% the review of applications is currently based on empirical data assessment of risk					100%	100%	<ul style="list-style-type: none"> • PEU biannual Progress Reports • Final Evaluation

Component 1: Coastal risk assessment, monitoring and management

Component 1 Outputs	Base Line	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5	Target (end of programme)	Comments and Verification
1.1. 6 Baseline studies on coastal and oceanographic processes - Nearshore wave - Coastal zone LIDAR Survey - Shoreline change - Circulation, water quality and sedimentation - Geotechnical surveys and investigations - Sediment transport	Zero	Consulting firm contracted and study processes commenced on 6 baseline studies.	<ul style="list-style-type: none"> • Coastal zone LIDAR survey completed • Geotechnical surveys and investigations completed 	<ul style="list-style-type: none"> • Nearshore wave study completed • Sediment transport study completed 	<ul style="list-style-type: none"> • Shoreline Change study completed • Circulation, water quality and sedimentation study completed 		6 Baseline studies on coastal and oceanographic processes completed	<ul style="list-style-type: none"> • Baseline studies • PEU biannual report • Mid-term and Final Evaluation

Component 1: Coastal risk assessment, monitoring and management								
Component 1 Outputs	Base Line	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5	Target (end of programme)	Comments and Verification
1.2 One risk assessment study of the coastal zone undertaken	None	Hazard identification and historical review completed for wind, storm surge and seismic hazards	Asset inventories prepared and categorized and vulnerability analysis completed.	Risk assessment study completed and approved by CZMU			Risk assessment study completed and approved by CZMU	<ul style="list-style-type: none"> • Hazard and risk assessment report • PEU biannual report • Mid-term and Final evaluation
1.3 Two reports on the Update of the Application of the System of Indicators of Disaster Risk and Risk Management for Barbados prepared.	1 Indicators study, with data updated to 2008		DesInventar database for Barbados developed.	One report on the Application of the System of Indicators of Disaster Risk and Risk Management , updated to 2012, completed		One report on the Application of the System of Indicators of Disaster Risk and Risk Management , updated to 2014, completed	Two reports on the Application of the System of Indicators of Disaster Risk and Risk Management, with information updated to 2012 and 2014	<ul style="list-style-type: none"> • PEU biannual report; • Consulting report • Mid-term and final evaluation
1.4 National coastal risk information and planning platform (NCRIPP) designed and operationalized in the CZMU.			Design of NCRIPP completed	100% baseline and other risk databases integrated into the NCRIPP	5 risk applications targeting the CZMU and strategic partners developed and integrated into NCRIPP.	NCRIPP operational at CZMU	NCRIPP operational at CZMU	<ul style="list-style-type: none"> • PEU biannual report • Consultant report • Mid-term and final evaluation

Component 2: Coastal Infrastructure

Comonent 2 Expected Outcomes	Base Line	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5	Total End of Program	Comments/ Verification
O2.1 Increased length of unimpeded, continuous lateral access to coast	0.5 k					1.5 km	Total of 2 km of unimpeded continuous lateral access to the coast	<ul style="list-style-type: none"> • PEU biannual reports • Final Evaluation Report
O2.2 Increase in length of coastline at Hometown stabilized and protected against climate related hazards (storm surge, sea level rise, flooding, beach erosion)	0					1.5 km	An additional 1.5 km of coastline at Hometown stabilized and protected against climate related hazards	<ul style="list-style-type: none"> • PEU biannual reports • Final Evaluation Report

Component 2: Coastal Infrastructure

Component 2 Outputs	Base Line	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5	Target (end of program)	Comments and Verification
2.1 Hometown Water Improvement Project completed (including fluidizer)	Final project design completed	Design approved and permits issued EIA completed and approved	Procurement of Engineering Contractor completed	50% of project completed according to approved project work breakdown schedule	Project completed		Project completed	<ul style="list-style-type: none"> • PEU biannual reports • Supervision Reports • Final Evaluation Report
2.2 Tent Bay project completed	Design completed and approved	Construction completed					Project completed	<ul style="list-style-type: none"> • PEU biannual reports • Supervision Reports • Final Evaluation Report

Component 2: Coastal Infrastructure								
Component 2 Outputs	Base Line	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5	Target (end of program)	Comments and Verification
2.3 Rockley Beach to St. Lawrence Gap Waterfront Improvement Project design and feasibility studies completed,	None		1 set of concept designs; 1 biological study; and numerical and physical modeling completed	1 set of Final Designs; and feasibility studies completed			Design and feasibility studies completed incorporating disaster risk reduction (DRR) and climate change adaptation (CCA) design parameters	<ul style="list-style-type: none"> • PEU biannual reports • Consultant Report • Final Evaluation Report
2.4 Ecosystem-based adaptation pilot project completed (e.g., biorock)	None	Project site selected and design completed	Ecosystem-based adaptation technology (e.g., biorock) completed and corals transplanted	First Annual Monitoring Report	Second Annual Monitoring Report	Final Report with conclusions and recommendations for expansion of the pilot project	Ecosystem-based pilot project completed. Final report based on 2 years of monitoring.	<ul style="list-style-type: none"> • Project design documents • Annual Monitoring Reports • PEU biannual reports • Mid-term and final evaluation report
2.5 Design of two additional coastal infrastructure projects completed incorporating DRR and CCA design parameters					Project sites selected based on approved CZMP	2 Project Designs completed	2 Project Designs completed	<ul style="list-style-type: none"> • PEU biannual reports • Project design documents • Final Evaluation Report

Component 3: Institutional sustainability for the Integrated Coastal Risk Management (ICRM)

Expected outcomes C3	Base Line	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5	Total End of Program	Comments/ Verification
3.1 Integrated coastal risk management mainstreamed into national development planning, measured in terms of % of TCDPO approved building applications that abide by CZMU's risk-based recommendations	0% number of decisions unknown due to lack of systematic feedback from TCDPO to CZMU.	Information sharing protocol signed between TCDPO and CZMU. Baseline established of % applications approved that adhere to CZMU recommendations				85% of building applications adhere to CZMU recommendations	85% of building applications adhere to CZMU recommendations	TCDPO approval statistics Program mid-term and final evaluations

Component 3: Institutional sustainability for the Integrated Coastal Risk Management (ICRM)

Component 3 Outputs	Base Line	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5	Target (end of program)	Comments and Verification
3.1 CZMU and strategic partners sensitization plan Communication strategy and action plan of sensitization and training on DRM and CCA in CZM prepared, organized and executed as follows: -CZMU 100% staff/management -5 strategic partners 100% staff/management focal points	None	1 Communication Strategy and action plan developed and approved set of agencies and focal points for sensitization and training identified	- 1 sensitization and training action plan implemented YR1 - 100% staff of CZMU and 100% focal points/managers from 5 strategic partners sensitized on incorporating DRM and CCA in CZM	1 Sensitization and training action plan implemented YR2. 100% of CZMU and of 5 strategic partners trained on incorporating DRM and CCA in CZM			Sensitization and training action plan implemented. 100% of CZMU and 100% focal points from 5 strategic partners sensitized and trained on incorporating DRM and CCA in CZM	<ul style="list-style-type: none"> • PEU Biannual reports; • Sensitization and Training workshop reports; • DRM and CCA position papers prepared by CZMU stakeholders • Final Evaluation (taking into account interviews with strategic partners)

Component 3: Institutional sustainability for the Integrated Coastal Risk Management (ICRM)								
Component 3 Outputs	Base Line	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5	Target (end of program)	Comments and Verification
3.1 Training of staff Training plan for CZMU staff prepared and executed as follows: - risk modelling, including climate change - 4; - assessment and data management - 4 - Development and Use of DesInventar database # - coastal zone enforcement for coastal inspectors – 20	None	1 Training plan defined	Training plan implemented 4 4 # 20				<ul style="list-style-type: none"> • Minimum of 4 CZMU staff trained in risk modeling including climate change and in assessment and data management • 20 coastal inspectors trained 	<ul style="list-style-type: none"> • PEU biannual progress reports • Training report • Risk Assessment Reports by CZMU staff; • Consultant report on Training • Mid-term and final evaluation reports
3.2 National ICZM Plan – revised, incorporating the DRM, CCA			1 ICZM Plan revised	1 Draft plan presented for public review and final draft version prepared	1 ICRM Plan approved by MEWRD and submitted to Cabinet		1 revised ICRM Plan incorporating the DRM, CCA approved by MEWRD and submitted to Cabinet	<ul style="list-style-type: none"> • PEU bi-annual reports • Ministerial Approval document • ICRM plan • Mid-term and final Evaluation
3.3 Regulations for the National ICZM Plan enacted	None			One set of basic regulations drafted	One set of ICZM regulations approved and enacted		One set of ICZM regulations approved and enacted	<ul style="list-style-type: none"> • PEU bi-annual reports • Ministerial Approval document • ICZM regulation • Mid-term and final Evaluation
3.5 2 Proposed strategies and action plans: DRM strategy for CZ and CCA strategy for CZ	None Draft National policy on CCA and Abatement		1 DRM strategy for CZ and action plan drafted Consultation	1 CCA strategic plan for CZ drafted harmonized with	2 Final strategic plans approved MEWRD		Final strategic plans for CCA and for DRM in CZ approved by	<ul style="list-style-type: none"> • PEU bi-annual reports • Approved Strategic Plan

Component 3: Institutional sustainability for the Integrated Coastal Risk Management (ICRM)								
Component 3 Outputs	Base Line	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5	Target (end of program)	Comments and Verification
	under review; There is an Emergency Management Act but no policy or strategy in place.		process completed	the draft CC national policy. Consultation process completed.			MEWRD	<ul style="list-style-type: none"> Mid-term and Final Evaluation
3.6 Policy for information sharing developed, approved and implemented including flow of information across agencies, harmonization of planning decisions	None			Information sharing policy drafted	Information sharing policy approved by MEWRD and presented to Cabinet		Information sharing policy approved by MEWRD and presented to Cabinet	<ul style="list-style-type: none"> PEU bi-annual reports Mid-term and Final Evaluation
3.9 Establishment of tools for implementing cost-recovery mechanism for coastal infrastructure.	0	Discussion paper completed. "Finance Charrette" process undertaken.	Position paper approved by MEWRD and presented to cabinet.				Proposal for the establishment of a cost recovery mechanism for coastal infrastructure submitted to cabinet for approval	<ul style="list-style-type: none"> PEU bi-annual reports Annual Report on Communication Strategic Action Plan Mid-term and Final Evaluation
3.10 Communication Strategy for public information on CRM developed and implemented	None	1 Communication Strategy drafted with strategic action plan	1 Communication Strategy and strategic action plan finalized and approved by MEWRD	1 action plan implemented YR1	1 action plan implemented YR2	1 action plan implemented YR3	Communication Action Plan implemented in accordance with the approved communication strategy	<ul style="list-style-type: none"> PEU bi-annual reports Annual Report on Communication Strategic Action Plan Mid-term and Final Evaluation

Summary Procurement Plan: October 2011 - April 2016

Ref No.	Description and type of the procurement contract	Estimated Contract Cost (US\$)	Procurement method ¹	Review (ex-ante or ex-post)	Source of financing and percentage		Pre-qualification (Yes/No)	Estimated dates		Status (pending, in process, awarded, cancelled)
					IDB %	Local/ Other %		Publication of specific procurement notice	Completion of contract	
I	Goods									
1	Project Vehicles <ul style="list-style-type: none"> NCB is normally required for goods above US\$50K in Barbados, however, price comparison is applicable for the purchase of a vehicle. 	120,000	PC	Ex-post	100	0	No	Q3 2011	Q4 2011	Pending
2	Hardware and Software for Coastal Risk Information Platform	379,500	ICB	Ex-post	100	0	No	Q3 2011	Q3 2011	Pending
3	Armour Stone	761,670	ICB	Ex-post	0	100	No	Q3 2011	Q3 2011	Pending
4	Beach Nourishment Sand	1,007,500	ICB	Ex-post	0	100	No	Q3 2011	Q3 2011	Pending
5	Computers and Software for Incremental PEU Staff Members	80,500	PC	Ex-post	100	0	No	Q4 2011	Q4 2011	Pending

¹ **PC:** Price Comparison; **IICC:** International Individual Consultant selection based on Qualifications; **DC:** Direct Consulting; **ICB:** International Competitive Bid (consortia); **NCB:** National Competitive Bid (team)

Ref No.	Description and type of the procurement contract	Estimated Contract Cost (US\$)	Procurement method ¹	Review (ex-ante or ex-post)	Source of financing and percentage		Pre-qualification (Yes/No)	Estimated dates		Status (pending, in process, awarded, cancelled)
					IDB %	Local/ Other %		Publication of specific procurement notice	Completion of contract	
6	Oceanographic Equipment for CZMU	805,000	ICB	Ex-ante	100	0	No	Q4 2011	Q4 2011	Pending
II Civil Works										
7	Tent Bay	622,955	ICB	Ex-post	100	0	No	Q3 2011	Q3 2012	Pending
8	Holetown Waterfront Improvement and Fluidization Project	6,969,660	ICB	Ex-ante	100	0	No	Q2 2012	Q2 2014	Pending
III Non-consulting Services										
9	Risk Communication (Media)		NCB	Ex-post	0	100	No	Q2 2012	Q2 2016	Pending
10	Incremental Personnel for the PEU (Administrative and Technical)	2,241,495	NCB	Ex-post	0	100	No	Q2 2012	Q2 2016	Pending
IV Consulting Services										
11	Coastal Risk Information Platform and Studies, Strategic Planning and Institutional Strengthening									

Ref No.	Description and type of the procurement contract	Estimated Contract Cost (US\$)	Procurement method ¹	Review (ex-ante or ex-post)	Source of financing and percentage		Pre-qualification (Yes/No)	Estimated dates		Status (pending, in process, awarded, cancelled)
					IDB %	Local/ Other %		Publication of specific procurement notice	Completion of contract	
11.1	Project Management total five year contract.	1,780,775	ICB	Ex-ante	100	0	No	Q2 2011	Q2 2016	Pending- Item is likely to be a consortium to undertake activities 11.2-11.16
11.2	Design of Coastal Risk Information Platform	1,664,443	ICB	Ex-ante	100	0	No	Q3 2011	Q4 2016	Pending
11.3	Nearshore Wave Study (excluding purchase of wave recorders)	628,475	ICB	Ex-ante	100	0	No	Q3 2011	Q2 2016	Pending
11.4	Coastal Zone LIDAR survey	1,162,765	ICB	Ex-ante	100	0	No	Q3 2011	Q2 2016	Pending
11.5	Shoreline Change study	536,446	ICB	Ex-ante	100	0	No	Q3 2011	Q2 2016	Pending
11.6	Circulation, WQ and Sedimentation study	2,255,495	ICB	Ex-ante	100	0	No	Q3 2011	Q2 2016	Pending
11.7	Geotechnical Investigations (including equipment)	1,242,000	ICB	Ex-ante	100	0	No	Q3 2011	Q2 2016	Pending
11.8	Sediment Transport Study	862,155	ICB	Ex-ante	100	0	No	Q3 2011	Q2 2016	Pending
11.9	Hazard Risk Assessment and Delineation	3,527,740	ICB	Ex-ante	100	0	No	Q3 2011	Q2 2016	Pending

Ref No.	Description and type of the procurement contract	Estimated Contract Cost (US\$)	Procurement method ¹	Review (ex-ante or ex-post)	Source of financing and percentage		Pre-qualification (Yes/No)	Estimated dates		Status (pending, in process, awarded, cancelled)
					IDB %	Local/ Other %		Publication of specific procurement notice	Completion of contract	
11.10	Coastal Sector Climate Change Adaptation Policy and Strategic Plan	425,040	ICB	Ex-ante	100	0	No	Q3 2011	Q2 2016	Pending
11.11	Update CZM Plan and Develop Prioritized Strategic Action Plan	1,430,140	ICB	Ex-ante	100	0	No	Q3 2011	Q2 2016	Pending
11.12	National CCA Policy; National Information Sharing Policy	422,740	ICB	Ex-ante	100	0	No	Q3 2011	Q2 2016	Pending
11.13	CZMU Training	1,138,776	ICB	Ex-ante	100	0	No	Q3 2011	Q2 2016	Pending
11.14	Strategy for Public Education Awareness	351,555	ICB	Ex-post	100	0	No	Q3 2011	Q2 2016	Pending
11.15	Strategic Action Plan for DRM	372,830	ICB	Ex-post	100	0	No	Q3 2011	Q2 2016	Pending
11.16	CZMU Operating Procedures and Change Management	57,500	NCB	Ex-post	100	0	No	Q3 2011	Q2 2016	Pending
12	Supervision of Construction for Hometown and Tent Bay Projects	466,111	DC	Ex-post	100	0	No	Q2 2011	Q4 2014	Pending-Continuation of previously competitively bid services

Ref No.	Description and type of the procurement contract	Estimated Contract Cost (US\$)	Procurement method ¹	Review (ex-ante or ex-post)	Source of financing and percentage		Pre-qualification (Yes/No)	Estimated dates		Status (pending, in process, awarded, cancelled)
					IDB %	Local/ Other %		Publication of specific procurement notice	Completion of contract	
13	Design of Coastal and Near Shore Risk Mitigation Infrastructure									
13.1	Project Stakeholder Consultations/Workshops	150,000	NCB	Ex-post	100	0	No	Q2 2014	Q2 2016	Pending
13.2	St. Lawrence Gap to Rockley Engineering Designs	1,725,000	ICB	Ex-ante	100	0	No	Q2 2014	Q2 2016	Pending
13.3	Additional Designs for Coastal and Near Shore Risk Mitigation	375,000	ICB	Ex-ante	100	0	No	Q2 2014	Q2 2016	Pending
14	QA/QC Consulting Firm	1,505,580	ICB	Ex-ante	100	0	No	Q2 2011	Q2 2016	Pending
15	External Audit Consulting Firm	201,250	NCB	Ex-post	0	100	No	Q2 2011	Q2 2016	Pending
16	Mid-term and Final Evaluation Consultant	57,500	NICQ	Ex-post	100	0	No	Q3 2014	Q2 2016	Pending

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/10

Barbados. Loan ____/OC-BA to the Government of Barbados
Coastal Risk Assessment and Management 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 Government of Barbados, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a coastal risk assessment and management program. Such financing will be for an amount of up to US\$30,000,000 from the Single Currency Facility of the Ordinary Capital resources of the Bank, 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 __ _____ 2010)

LEG/SGO/BA-35404263-10
BA-L1014