



# Project Completion Report

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## PCR

**Project Name:** Coastal Infrastructure Programme

**Country:** Barbados

**Sector/Subsector:** Environment and Natural Disasters

**Original Project Team:** Eduardo Figueroa (RE3/EN3) Project Team Leader; Leonardo Corral (RE3/EN3); Ancile Brewster (COF/CBA); Valnora Leister (LEG/OPR); Seth Tyler. (Consultant):

**Project Number:** BA0019

**Loan Number (s), TC(s):** 1386/OC-BA

**QRR Date:** August 16, 2010

**Final Approval Date of PCR:** August 25, 2010

**PCR Team: Principal Author and Members:** Sybille Nuenninghoff (RND/CGY), principal author; Michele Lemay (INE/RND); Janette Archer-Headley (CCB/CBA) and Paula Louis-Grant (PDP/CBA)



## Acronyms and Abbreviations

CCPIP	Coastal Conservation Pre-Investment Program
CIP	Coastal Infrastructure Program
GOB	Government of Barbados
CZMP	Coastal Zone Management Plan
CZMU	Coastal Zone Management Unit
HWM	High Water Mark
IDB	Inter-American Development Bank
MPE	Ministry of Physical Development and Environment
NSPB	National Strategic Plan of Barbados
PAU	Project Administration Unit
TCP	Town and Country Planning



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## Annexes



## I. Basic Information

BASIC DATA (AMOUNTS IN US\$)							
<b>PROJECT NO:</b> BA0019	<b>TITLE:</b> Coastal Infrastructure Programme						
<b>Borrower:</b> Barbados	<b>Date of Board Approval:</b> 09 Jan 2002						
<b>Executing Agency (EA):</b> Ministry of Physical Development and Environment (MPE)	<b>Date of Loan Contract Effectiveness:</b> 09 Oct 2002						
<b>Loan(s):</b> 1386/OC-BA	<b>Date of Eligibility for First Disbursement:</b> 26 Mar 2003						
<b>Sector:</b> ENVIRONMENT AND NATURAL DISASTERS	<b>Months in Execution</b>						
<b>Lending Instrument:</b> Investment specific	* from Approval: 98						
	* from Contract Effectiveness: 89						
	<b>Disbursement Periods</b>						
	<b>Original Date of Final Disbursement:</b> 09 Apr 2007						
	<b>Current Date of Final Disbursement:</b> 09 Dec 2009						
	<b>Closing Date:</b> 26 Feb 2010						
	<b>Cumulative Extension (Months):</b> 24						
	<b>Special Extensions (Months):</b> 8						
	<b>Loan Amount(s)</b>						
	<b>Original Amount:</b> US\$ 17,000,000						
	<b>Current Amount:</b> US\$ 16,816,891						
	<b>Local Contribution (GOB):</b> US\$ 13,508,466						
<b>Poverty Targeted Investment (PTI):</b> No	<b>Disbursements</b>						
<b>Social Equity (SEQ):</b> No	<b>Amount to date:</b> 100 (%)						
<b>Environmental Classification:</b>	<b>Total Project Cost (Original Estimate):</b> US\$ 24,200,000						
	<b>Current Total Project Cost:</b> US\$ 30,325,357						
	<b>Redirectioning</b>						
	<b>Has this Project?</b>						
	Received funds from another Project <input type="checkbox"/>						
	Sent funds to another Project <input type="checkbox"/>						
	N/A <input checked="" type="checkbox"/>						
	<table border="1"> <thead> <tr> <th>To/From Project Number</th> <th>From Sub-Loan Number</th> <th>Amount</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	To/From Project Number	From Sub-Loan Number	Amount			
To/From Project Number	From Sub-Loan Number	Amount					
	* Current amount (adjusted for redirectioning):						
	<b>On Alert Status</b>						
	Is project currently designated "on alert" by PAIS: No						
	If yes then why is the project on alert						
	<b>Comments on relevance of "on alert" status for this project (if applicable):</b> N/A						

Summary Performance Classifications				
DO	<input type="checkbox"/> Highly Probable (HP)	<input checked="" type="checkbox"/> Probable (P)	<input type="checkbox"/> Low Probability (LP)	<input type="checkbox"/> Improbable (I)
IP	<input type="checkbox"/> Highly Satisfactory (HS)	<input checked="" type="checkbox"/> Satisfactory (S)	<input type="checkbox"/> Unsatisfactory (US)	<input type="checkbox"/> Very Unsatisfactory (VU)
SU	<input type="checkbox"/> Highly Probable (HP)	<input checked="" type="checkbox"/> Probable (P)	<input type="checkbox"/> Low Probability (LP)	<input type="checkbox"/> Improbable (I)



## **II. The Project**

### **a. Project Context**

The Coastal Infrastructure Program (CIP) was developed in response to the strategic focus of Barbados on enhancing environmental infrastructure and natural resources management. During implementation, the GOB introduced the 2005-2025 National Strategic Plan of Barbados (NSPB). One of the goals of the NSP is to strengthen the physical infrastructure and preserve the environment. One of the objectives is to promote and facilitate the environmentally sustainable use of natural resources and one of the corresponding strategies is to ensure effective conservation of the island's coastal and marine eco-systems and living resources, while improving their quality. The Coastal Infrastructure Programme is consistent with the objectives and strategies of the NSPB.

In recognition of the importance of tourism to Barbados' economic progress, the CIP was designed to improve coastal infrastructure with a view to maintaining, improving and enhancing access to beaches and shoreline for tourists and residents alike. The economic context of the project changed in light of the global economic recession of 2008-2010 which led to a 10% decline in tourist/visitor arrivals compared with 2007; a decline greater even than the 7% decline that followed the events of September 2001. These fluctuations and declines following economic downturns have negatively impacted the tourism industry, resulting in increased competitive pressure for Barbados to maintain and enhance its tourism product in order to successfully compete with a reduced regional and global demand for tourism. Thus, the economic justification of the Program as a means to maintain and improve beaches and beach access takes on an even greater importance compared to when the Program was conceptualized.

The Coastal Infrastructure Programme was the fourth IDB-financed loan operation in Barbados in support of GOB efforts to implement coastal zone management in the country. Between 1983 and 1984, a Diagnostic and Pre-Feasibility Study of the island's coasts was conducted by the GOB with financial support of the IDB. Two further programmes were subsequently supported through pre-investment loans: the Coastal Conservation Pre-Investment Programme (Loan 571/OC-BA for US\$4.7 million) and the technical cooperation Coastal Conservation Programme Phase I (Loan 856/OC-BA for US\$3.6 million).

The Coastal Conservation Pre-Investment Program (1991 to 1995) focused on the west and south coasts and designed various engineering and non-engineering measures for beach creation, stabilization, and enhancement. Demonstration projects for beach improvement and protection were constructed at a cost of US\$3 million, of which the Bank contributed with US\$1.75 million. The programme also undertook environmental impact assessments of existing and proposed works, and prepared two Draft Bills for submission to Parliament-the draft Coastal Zone Management Bill and the Marine Pollution Control Bill. Another important output of the Programme was the preparation of the Coastal Zone Management Plan for the West and South Coasts. Additionally, engineering designs and a feasibility assessment for selected investments along the west and south coast were developed.

Following the successful Coastal Conservation Pre-Investment Programme, the GOB sought further assistance from the IDB in financing the first phase of a comprehensive, island-wide coastal zone management program, the Coastal Conservation Programme Phase I. Completed in 1999, this Technical Cooperation (TC) focused on diagnostic studies for the Atlantic Coast, to complement those previously conducted on the west and south coasts. This TC also prepared a detailed Coastal Zone Management Plan for the entire island, provided support to institutional strengthening efforts, and identified cost recovery mechanisms necessary for financing coastal management projects in Barbados. An important output of Phase I is the design and feasibility assessment of a package of capital works, submitted for the GOB consideration, which would form the basis of an investment phase program. The feasibility studies defined selection criteria through which the projects have been subsequently ranked for selection.



## b. Project Description

### i. Development Objectives

The development objective of the Coastal Infrastructure Programme was to support the sustainable development and improvements for shoreline preservation and management in Barbados in order to ensure a healthy environment and continued economic development for its inhabitants.

The Program had the four specific objectives, as presented in Table 1:

**Table 1**  
**Specific Objectives**

Objective
1. To create and/or enhance the amenity value of beaches for local and tourist use through the implementation of shoreline stabilization and erosion control projects.
2. To restore and protect affected ecosystems through the implementation of coastal infrastructure recovery projects.
3. To encourage safe and increased access to the waterfront through coastal access improvement projects.
4. To upgrade capabilities and support the process of innovating coastal management, through the implementation of institutional strengthening activities for CMZUCZMU and the Ministry of Physical Development and Environment (MPE).

### ii. Components

The program comprises four Components; each component corresponding to one of the specific objectives:

**Component 1: Shoreline Stabilization and Erosion control.** The shoreline stabilization and erosion control engineering projects aimed to create and/or enhance the amenity value of beaches for local and tourist use, providing the catalyst for private sector investment in the rehabilitation of properties and infrastructure along the intervened section of waterfront.

**Component 2: Restoration of Coastal Habitats.** In recognition of the combined impact of man-made and natural events on degradation, damage and loss of valuable coastal and marine habitats and pressure, this Component included projects that were designed to contribute to the restoration and protection of important impacted ecosystems, including dune rehabilitation and water quality improvements.

**Component 3: Improvement of Public Coastal Access:** Activities aimed to encourage increased access to the waterfront through the establishment, where there is local interest and community support, of coastal foot-paths and new accesses.

**Component 4: Institutional Strengthening for Coastal Management.** The aim of this Component was to upgrade capabilities and support the process of innovation in coastal conservation. While the institutional framework for coastal zone management in Barbados was already considered to be quite strong when the Program was formulated, this Component was designed to complement the on-going institution strengthening initiatives within the MPE to reinforce Barbados' system for integrated coastal zone management.

As originally conceived, the Program was to comprise the following projects as well as institutional strengthening activities for the CZMU (Table 2):

Table 2:

**Initial Programme Structure (Planned Projects and Activities)**

Component	Projects and Activities	US\$ million	%
<b>Shoreline Stabilization and Erosion Control</b>	Coastal engineering projects:		
	- Rockley to Drill Hall – Waterfront Improvement	7.9	47%
	- Woman's Bay (Silver Sands)-Headland Protection	1.2	7%
	- Crane Beach, St. Phillip–Restoration & Enhancement	2.0	12%
	- Holetown Beach Improvement	0.7	4%
	- Welches Beach Improvement	7.5	15%
<b>Restoration of Coastal Habitats</b>	- Holetown Beach–Lagoon Aeration System	0.2	1%
	- Walkers Savannah–Dune Restoration	0.5	3%
<b>Improvement of public coastal access</b>	- Bay Street-Demolition and Replacement of Old Hospital Jetty	0.8	5%
	- Tent Bay-Boat Access and Slipway	0.8	5%
<b>Institutional strengthening for coastal management</b>	- Coastal Zone Management Unit (CZMU) equipment and technical support	0.3	2%
	- MPE staff training	(total component)	
	- MPE strategic plan development		
	- MPE public education strategy development		

As a result of requests from GOB in 2007, the Woman's Bay (Silver Sands)-Headland Protection Project and the Walker's Savannah-Dune Restoration project were removed from the Programme due to technical reasons. These two projects together represented 10% of the original budget for civil works. In October 2008, IDB and GOB agreed to remove the following projects due to delays in implementation and cost overruns:

- i) Holetown Beach–Lagoon Aeration System project;
- ii) Walkers Savannah-Dune Restoration project;
- iii) Bay Street-Demolition and Replacement of Old Hospital Jetty project;
- iv) Tent Bay-boat access and slipway project;.
- v) Crane Beach, St. Phillip – Restoration & Enhancement.

These projects represented 14% of the original budget for civil works. It was also decided to reduce the length of the Rockley to Drill Hall Project.

The Rockley to Drill Hall-Waterfront Improvement project was to be the major investment in the programme, accounting for 48% of civil works budget. Initially, the project only included shoreline stabilization and beach enhancement elements. During implementation, however, this project underwent significant redesign and was upgraded to include an extensive boardwalk. As a result of this design modification and the resultant increase in unit cost, the length of the project was reduced from 2.25 km to 1.6 km, extending from Rockley Beach to Coconut Court.

Based on the above decisions, the Program was adjusted to the following infrastructure projects:

- i) Welches Beach Improvement project (financed with GOB funds)
- ii) Holetown Beach Improvement project (financed with IDB funds)
- iii) Rockley to Coconut Court Waterfront Improvement Project (financed with IDB funds)

Section III describes the circumstances behind these decisions.

## a. Quality -At- Entry Review (NA)

### III. Results

#### a. Outcomes

Indicator	Outcomes Achieved
<p><b>1. Safe access to waterfront increased, comparing pre- and post-project data after structures are installed.</b></p> <p><b>Classification: P</b></p>	<p>Safe access to the waterfront has been increased as a result of the Rockley to Coconut Court Waterfront Improvement Project as the Hometown Beach Improvement project. These 2 projects created a total of total of 4.5 km of continuous safe beach access.</p> <p><u>Rockley</u>: Length of Boardwalk is 1.2km; Length of boardwalk and beach from Rockley to Hilton is 3km</p> <p><u>Hometown</u>: Length of Concrete Walkway is 500 meters; Length of Boardwalk and Beach from Sandy Lane to Discovery Bay is 2.5km</p> <p><u>Welches</u>: Created lateral beach access from Welches Bay to Hometown as a result of beach accretion directly related to the project's coastal infrastructure</p>
<p><b>2. Person days at project beach locations increased as measured by technical indicators to be determined, with baseline study conducted in 2007, and follow-up by April 2009.</b></p> <p><b>Classification P</b></p>	<p>The Rockley to Coconut Court Waterfront Improvement Project together with the Hometown Beach Improvement project have increased the number of person-days of shoreline leisure. It is important to clarify that these projects have not increased person-days at beaches <i>per se</i>, but rather have increased the number of person-days of leisure and recreational use along the coastal shoreline, as a direct result of the increased access that these projects provide.</p> <p>Since the two projects involve coastline that was previously difficult to access laterally, these two locations were not used by many people. The Baseline was there assumed to equal 0.</p> <p>The Boardwalk has resulted in an <b>increase of around 64,000 person-hour per year<sup>1</sup></b> of safe and enjoyable access to the coast.</p> <p>The Hometown Beach Improvement project has created connections to beaches that were previously difficult to reach leading to a significant increase in use of prime beaches such as Sandy Lane.</p>
<p><b>3. Water quality improved measured by technical indicators to be determined, with baseline study conducted in 2007<sup>1</sup>, and ex-post conducted by December, 2009.</b></p>	<p>Of the 9 projects included in the original Programme design, only the Hometown Lagoon project was designed to impact on water quality. This project had a planned cost of US\$200,000 and represented only 1.2% of the planned coastal infrastructure</p>

<sup>1</sup> The baseline was not carried out because of the recognition on the part of the PAU that in the areas that three projects were to be implemented, water quality was not expected to be affected. Turbidity, however, was identified as a possible issue during construction, and baseline turbidity measurements were taken prior to and during construction of the projects. Turbidity is measured in Formazine Turbidity Units (FTU). Baseline (before project) FTU for Rockley was Average values along the site ranged from 14.0 FIU at Rockley to 3.1 FTU at the West Limit of the site

<b>Classification: I</b>	works.  The projects that were completed were not designed to improve water quality. Given, the nature of the projects it was decided that the only marine water quality parameter that was necessary to monitor during construction was turbidity.
<b>4. Beach volume increased by 26,400 cubic meters by December, 2009</b> <b>Classification: HP</b>	Beach volumen increased by 15, 385m3, including 10, 677m3 on Rockly to Coconut Court Project; 2,697.83 m3 at Holetown Beach and 2,000 m3 at Welches Beach.  Note: This indicator refers to the combined goal for Rockley Beach to Coconut Court, Holetown Beach and Crane Beach.
<b>5. Opinion survey about shoreline improvements and benefits among locals and tourist conducted in 2007, with follow-up by December 2009.</b> <b>Classification: P</b>	According to a stakeholder survey undertaken as part of the final evaluation, 100% of respondents agree or strongly agree that the projects are beneficial to Barbados. 50% of business respondents indicated that monthly revenue has increased by 1% to 5% as a direct consequence of the projects.  Note: the opinion survey referred to in the logical framework wasn't under taken by the CPU.

#### Summary Development Objective(s) Classification (DO):

☐ Highly Probable (HP)      ☒ Probable (P)      ☐ Low Probability (LP)      ☐ Improbable)

Briefly justify DO classification, based on degree to which planned targets were met, explaining the differences between planned and achieved outcomes as well as any other relevant factors. Include references to evidence that can support these results.

The principal investment project, Rockley to Coconut Court, has had an impact far beyond the original design. By incorporating a wide boardwalk, five aesthetically-designed and well-landscape headlands, as well as revetments that incorporate steps to enhance low-tidal access, this project has surpassed the impact that was expected for the Bay Street Old Hospital Jetty Project and the Tent Bay boat access Project, which were the two projects corresponding to Objective 3 (Table 1). The Boardwalk and its related infrastructure have become a social rendezvous point and a destination in its own right, for locals and tourists alike, for strolling, jogging and scenic viewing. It is estimated that this project alone has resulted in an **increase of around 16,000 person-days per year<sup>1</sup>** of safe and enjoyable access to the coast.

The three projects have increased beach volume by around 16,000 cubic meters. The Rockley project, as well as the Holetown project, has increased property values of several of the properties that were particularly affected by storm surge and erosion.

For restaurants that abound the Rockley Boardwalk and the Holetown walkway, revenue has increased by around 2.5% based on the results of a stakeholder questionnaire.

[<sup>1</sup>One person day is defined as 4 hours of beach/coast time].

## b. Externalities

CMZMU's experience of participation with the Programme Design and Supervision consultants has significantly raised the standards for coastal infrastructure design and construction in Barbados.

(Figure 4). Within each site there was considerable variation, this was greatest at the Rockley location where values ranged from 1.1 FTU to 63.5 FIU. The lowest variation occurred at the West Limit of the site where values ranged from 0.2 FTU to 19.1 FIU.



The experience of the Rockley to Coconut Court Boardwalk has had highly positive social consequences that transcend the original design concept of the project. Although financed under the Shoreline Stabilization Component, the project is equally as successful in terms of impact on beach access. Beyond the provision of lateral access to the coastal shoreline, the Boardwalk has become an important rendezvous point and a magnet for leisure, social interaction and recreational purposes.

### c. Outputs

IMPLEMENTATION PROGRESS (IP)		
Components (Outputs):		
Component I: Shoreline Stabilization and Erosion Control		
	PLANNED	ACTUAL
Total Cost:	18,100,000	27,237,829
Counterpart:	4,200,000	11,177,829
IDB :	13,900,000	16,160,000
IDB Disbursement :	77%	59%
Classification: Satisfactory (S)		
Key Output Indicators <sup>2</sup> :		
Project/Indicators	Outputs Achieved	
1.1 Rockley to Coconut Court		
a) Five landscaped headlands constructed;	a) Five landscaped headlands constructed (100%);	
b) 1,200m of boardwalk and revetment and steps constructed 14 months after start date;	b) 1.2 km of boardwalk and revetment and steps constructed 18 months after start date (100);	
c) Beach recharged with 14,000 mt3 of sand twelve months after start date;	c) Beach recharged with 10,677 mt3 of sand twelve months after start date (76%);	
d) 38 m offshore Breakwater constructed;	d) 38 m Breakwater constructed (100%);	
1.2 Holetown Beach		
a) Two headlands constructed, 6 months after start date;	a) Two headlands constructed 7 months after start date (100%);	
b) New walkway protected by boulder revetment constructed seven months after start date;	b) New walkway protected by boulder revetment constructed 8 months after start date (100%);	
c) 2,500 cubic metres of beach sand placed 7 months after start date.	c) 2,698 cubic metres of beach sand (108%);	
1.3 Welches Beach		
a) Construction of a retaining wall with a walkway along the seaward edge and access steps to the beach;	a) Construction of a retaining wall with a walkway along the seaward edge and access steps to the beach (100%);	
b) Construction of a revetment along the seaward edge of the roadway and fronting the retaining wall; construction of three new groynes and refurbishing of the one existing groyne;	b) Construction of a revetment along the seaward edge of the roadway and fronting the retaining wall; construction of three new groynes and refurbishing of the one existing groyne (100%);	
c)placement of approximately 12,000 cubic	c) Placement of approximately 12,000 cubic meters of sand recharge	

<sup>2</sup> Reformulated Logical Framework Model of April 23, 2007

meters of sand recharge. (100%);

**Briefly explain differences between planned and actual outputs (if applicable).**

As described in section II, based on the agreements between GOBA and Bank the following construction sites were not implemented:

**Womens' Bay (Silver Sands) – Headland Protection project:** removed due to the detection of changed bathymetric conditions that would have required a higher-cost solution than budgeted, and also due to the findings of additional studies which revealed that the project would not benefit the public beach area, but rather only one private landowner. Thus, the astuteness of the Design and Supervision Consultants, together with CMZMU support, resulted in the timely identification of issues that concerning the preliminary design and the priority ranking of the project.

**Crane Beach, St. Phillip-Restoration & Enhancement project:** implementation of the project was frustrated by land acquisition issues (the current access road was on private property). The project was further complicated by an unrelated legal dispute between the owner of the property at the Crane and the GOB.

**Bay Street-Demolition and Replacement of Old Hospital Jetty project:** Removed at the request of GOB due to a down-grading in priority of the project. The old jetty was subsequently demolished and removed by GOB.

**Tent Bay-Boat Access and Slipway project:** Two international public competitive bidding processes were undertaken, both of which were declared non-responsive due to the receipt of only one acceptable bid on each occasion. Part of the difficulty in obtaining a large number of competitive bids was thought to be due to the technical complexity of the project design. A proposal was presented to undertake additional work to develop a modified design, however approval for the funds required for this work was not approved.

**Additional studies:** During the implementation of the CIP, the Design and Supervision Consultants undertook the following additional studies: the Woman's Bay bathymetric study; the Worthing Beach Monitoring Studies and Recommendations; the Coconut Court to Needham's Point Coastal Processes Investigation. The Woman's Bay study was undertaken to confirm the initial design after a data gathering exercise revealed that the offshore conditions were deeper than the initial design study had indicated. The other two studies were undertaken to gather data about the impact the beaches have on the project areas, and conversely gain a better understanding of how the Rockley to Coconut Court project would impact those areas.

**Restructuring. Indicate if this component was restructured (date of approval by Manager). Briefly discuss the consequences of these changes. [ X ] No**

**Component II: Restoration of Coastal Habitats**

	PLANNED	ACTUAL
<b>Total Cost:</b>	700,000	N/A
<b>Counterpart:</b>	210,000	N/A
<b>IDB :</b>	490,000	N/A
<b>IDB Disbursement :</b>	70%	N/A

**Classification:** Satisfactory (S)

Key Output Indicators <sup>3</sup> :	
Project/Indicators	Outputs Achieved
Holetown Beach-Fluidizer System Fluidizer system installed	Final design completed and approved.

**Briefly explain differences between planned and actual outputs (if applicable).**

The two projects (Walkers Savannah and Holetown Lagoon) that were originally contemplated under this Component

<sup>3</sup> Reformulated Logical Framework Model of April 23, 2007



were not implemented:

**Holetown Beach-Lagoon Aeration System project:** during their review of the initial project design, the Design and Supervision Consultants identified that the initial design would not sufficiently resolve the issue of stagnant water that the project was intended to resolve. An opportunity to increase the effectiveness of the project was identified through additional hydrologic studies that were undertaken. The result was an enhanced design that included, in addition to the original aerator, a fluidizer system that would reduce the frequency of sand accumulation and the retention time of water in the drains and natural water course that terminate at the beaches along the coast of the Holetown Lagoon. The enhanced design changes were necessitated approval from Town and Country Planning. Final approval for the application to Town and Country Planning was obtained on June 30, 2009, by which date insufficient time remained to complete the project within the timeframe of the Programme implementation period. This project could be considered in the follow-up investment programme to the CIP.

**Walkers Savannah-Dune Restoration project:** removed because the natural environmental recovery of this ecosystem, in tandem with effective prohibition by CZMU of sand mining in the area, made the project redundant. The alertness of CZMU and the PAU in monitoring the natural recovery process resulted in a cost savings of US\$0.5 million.

**Restructuring. Indicate if this component was restructured (date of approval by Manager). Briefly discuss the consequences of these changes. [ X ] No**

**Component III: Improvement of Public Coastal Access**

	PLANNED	ACTUAL
<b>Total Cost:</b>	1,700,000	N/A
<b>Counterpart:</b>	510,000	N/A
<b>IDB :</b>	1,190,000	N/A
<b>IDB Disbursement :</b>	70%	N/A

**Classification:** Highly Satisfactory (HS)

**Bay Street-Demolition and Replacement of Old Hospital Jetty project:** Removed at the request of GOB due to a down-grading in priority of the project. The old jetty was subsequently demolished and removed by GOB.

**Tent Bay-Boat Access and Slipway project:** Two international public competitive bidding processes were undertaken, both of which were declared non-responsive due to the receipt of only one acceptable bid on each occasion. Part of the difficulty in obtaining a large number of competitive bids was thought to be due to the technical complexity of the project design. A proposal was presented to undertake additional work to develop a modified design, however approval for the funds required for this work was not reached.

Although the two projects (Old Hospital Jetty and Tent Bay Access and Slipway project originally include under this Component were removed from the Programme, nonetheless the principal infrastructure project of the Program, Rockley to Coconut Court, has had an impact in terms of coastal access improvement that far exceed the original design parameters of that project and that surpasses the expected impact of the two projects that were removed.

By incorporating a wide boardwalk, five aesthetically-designed and well-landscape headlands, as well as revetments that incorporate steps to enhance low-tidal access, this project has surpassed the impact that was expected for the Bay Street Old Hospital Jetty Project and the Tent Bay boat access Project, which were the two projects corresponding to Objective 3 (Table 1). The Boardwalk and its related infrastructure have become a social rendezvous point and a destination in its own right, for locals and tourists alike, for strolling, jogging and scenic viewing. It is estimated that this project alone has resulted in an **increase of around 64,000 coastal access hours per year** of safe and enjoyable access to the coast.

**Restructuring. Indicate if this component was restructured (date of approval by Manager). Briefly discuss the consequences of these changes. [ X ] No**



**Component IV: Institutional Strengthening for Coastal Management**

	PLANNED	ACTUAL
<b>Total Cost:</b>	300,000	428,314
<b>Counterpart:</b>	200,000	428,314
<b>IDB :</b>	100,000	N/A
<b>IDB Disbursement :</b>	30%	N/A

**Classification:** Satisfactory (S)

**Key Output Indicators<sup>4</sup>:**

Project/Indicators	Outputs Achieved
<b>1. Coastal Zone Management Unit (CZMU) equipment and technical support</b> a) Installation of GIS equipment and training in GIS for CZMU b) Quality Control Consultant and Quality Assurance Consultants contracts	a) GIS equipment installed and GIS training provided to CZMU b) Quality Control Consultant and Quality Assurance Consultant contracted for the duration of the Programme
2. MPE staff training	
3. MPE strategic plan development	
4. MPE public education strategy development	Not undertaken due to institutional restructuring of Ministry during implementation

All activities directly associated with CZMU were completed. They include numerical and physical model training and selection, GIS information systems upgrade and training and the Barbados 3D model development, installation, and training. Construction management training was provided. Under this Component, support was also provided to a CZMU staff member who completed a Master's degree in Coastal Engineering from Plymouth University in England.

The foreseen institutional strengthening activities, directly linked to the MPE (Ministry of Physical Development and Environment), as MPE staff training, development of a strategic plan and public education strategy could not be undertaken, due to the restructuring issues of the Ministry. During the implementation of the programme the Ministry within the CZMU was initially situated, has been restricted twice and ultimately became the Ministry of Environment, Water Resources & Drainage.

**Restructuring. Indicate if this component was restructured (date of approval by Manager). Briefly discuss the consequences of these changes. [ X ] No**

**Summary Implementation Progress Classification:**

[ ] Highly Satisfactory (HS)    **[ X ] Satisfactory (S)**    [ ] Unsatisfactory (U)    [ ] Very Unsatisfactory (VU)

**d. Project Costs (US'000)**

CATEGORY	ORIGINAL BUDGET				ACTUAL DISBURSEMENTS			
	BANK	LOCAL	TOTAL	%	BANK	LOCAL	TOTAL	%
I. Administration & Supervision	0	2,333	2,333	10%	0	11,593	11,593	38%
1.1 Project Administration Unit		633	633	3%	0	1,598	1,598	5%
1.2 Engineering Design & Supervision		1,500	1,500	6%	0	9,906	9,906	33%
1.3 Auditing		200	200	1%	0	89	89	0%
II. Direct Costs	14,000	2,900	16,900	70%	16,160	1,711	17,871	59%
2.1 Civil Works	13,900	2,700	16,600	69%	16,160	1,283	17,443	58%
2.2 Institution Strengthening	100	200	300	1%	0	428	428	1%

<sup>4</sup> Reformulated Logical Framework Model of April 23, 2007

III. Unallocated Costs	<b>1,000</b>	<b>1837</b>	<b>2,800</b>	<b>12%</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0%</b>
3.1 Contingencies	1,000	1,000	2,000	8%	0	0	0	0%
3.2 Escalation		837	837	3%	0	0	0	0%
Subtotal	15,000	7,070	22,370	92%	<b>16,160</b>	<b>13,305</b>	<b>29,465</b>	<b>97%</b>
IV. Financial Costs	<b>2,000</b>	<b>130</b>	<b>2,130</b>	<b>9%</b>	<b>657</b>	<b>204</b>	<b>861</b>	<b>3%</b>
4.1 Interest	1830		1830	8%	647	0	647	2%
4.2 Credit Commission		130	130	1%	0	204	204	1%
4.3 Credit Inspection and Supervision	170		170	1%	10	0	10	0%
Total	<b>17,000</b>	<b>7,200</b>	<b>24,200</b>	<b>100</b>	<b>16,817</b>	<b>13,508</b>	<b>30,325</b>	
Percentage	70	30	100		55%	45%	100%	

Briefly explain any differences. At US\$30.3 million, the total actual cost of the Programme was 25% higher than the original budget of US\$24.2 million and the implementation period proved to be 60% longer than originally anticipated. The higher costs and longer implementation period were primarily due to the fact that the original cost and time estimates were based on preliminary project designs and underestimated the time required to complete and obtain approval for final project designs. The additional implementation period resulted in significantly increased costs for the supervisory services of the international consulting firm that was contracted to carry out the final project designs and provide supervision during their implementation.

## IV. Programme Implementation

### a. Analysis of Critical Factors

The Programme was implemented between 2003 and 2010. From 2003 until 2006, the Programme was financed by GOB. During the first five years of the Programme, only US\$ 0.8 million of IDB financing was used. The Disbursements by year and source are the following (US\$ millions):

	2003	2004	2005	2006	2007	2008	2009	2010	TOTAL
IDB	-	0.0	0.0	0.0	0.8	1.4	6.4	8.1	<b>16.8</b>
GOB	1	2.3	4.8	2.8	1.5	3.1	1.9	-3.8	<b>13.5</b>
TOTAL	<b>0.9</b>	<b>2.3</b>	<b>4.8</b>	<b>2.8</b>	<b>2.4</b>	<b>4.5</b>	<b>8.3</b>	<b>4.3</b>	<b>30.3</b>
% Annual	3%	8%	16%	9%	8%	15%	27%	14%	100%
% Cumulative	3%	11%	27%	36%	44%	58%	86%	100%	

The principal causes for the program implementation delays were:

- The additional time that was required to complete the final project designs. Because the Loan Contract Agreement was signed on the basis of preliminary project designs, it was necessary to undertake technical due diligence that involved data collection, mathematical and physical modelling using state-of-the-art methods. While finalization of design was contemplated in the implementation plan, the modelling and testing process revealed significant weaknesses that necessitated additional study and resulted in significant improvements that are reflected in the final project designs;
- Delays related to the approval process of final designs were mainly due to obtain the permits from Town and Country Planning Office. The TCP approval process took an average of 145

days, although the project design tried to mitigate this risk through the proposed Steering Committee, which also included a TCP Senior Town Planner;

- iii) Delays related to pre-qualification and procurement of Contracting Services to undertake the implementation of the coastal infrastructure projects. Two of the International Competitiveness Bidding processes were non-responsive and had to be repeated.
- iv) In addition, a potential constraint was the availability of key material used in the project. Other large construction projects in Barbados (Port Expansion and Renewal Project and the 2007 World Cricket competition awarded to Barbados) competed for scarce key material (e.g. armour stone and sand) and affected timely availability and / or price.
- v) In spite of intensive stakeholder consultation, delays were also related to obtaining throughway permission on private property in order to access project construction site; already concluded negotiations between private owner and CZMU have been jeopardized by the high property ownership turnover rate in Barbados, especially on coastal land sites.

It is important to emphasize that the actual construction process was implemented according to the planned timeframes for all projects once final designs were in place, the procurement and contracting process had been completed, access to the work sites had been obtained, and approval process had been completed.

The critical factors for the success of the construction process were:

- i) A technically strong executing agency. CMZMU's prior experience and expertise in Coastal Zone Management;
- ii) The high technical level and professional dedication of Project Administration Unit;
- iii) Excellent design and supervision consultant firm, with conducted rigorous design testing process with mathematical and physical models and which succeeded in infusing the Programme's implementation with design and construction best-practices;
- iv) Strong supervision of works (CMZMU staff participated, permitted and learning on the job of leading-edge coastal zone engineering techniques and rigorous procurement documentation standards;
- v) Delay in project implementation resulted in the natural recovery of Savannah Dune (cost savings);
- vi) Embedded nature of PAU in CZMU strengthened CZMU as an institution;
- vii) Notwithstanding the implementation delays related to site-access-permits, the rigorous intensive stakeholder consultation process, involving one-on-one visits with each property owner directly affected by the projects, as well as public meetings to obtain input to finalize the design and additional public meetings during construction to inform property owners of the progress and to provide a forum for the discussion and resolution of issues, has to be considered as best practice for coastal engineering.

The implementation process would have been improved by a more complete planning exercise that included timelines for the pre-qualification and procurement process; the challenges and time required to obtain permission to access private property during construction. Similarly, the time required for the approval process from Town and Country Planning was significantly underestimated.

The PAU had the installed capacity to implement one infrastructure project at a time. There would not have been adequate capacity to implement all of the nine projects that were contemplated in the original program design.

Program implementation would have benefited from a more rigorous planning exercise that would have included the development of project management documents that are necessary for adequate planning supervision such as: a Program Implementation Plan for the program as a whole; Annual Plans of Operation; an Operations Manual (describing, for instance, the procedures that were to be followed for public consultation and protocols for responding to issues related to the public during construction. The usefulness, as a supervisory tool, of progress reports prepared by the PAU would have been enhanced by including key progress information showing planned timelines compared to actual achievement, and Gantt charts comparing physical and financial advance of project.

Program implementation would have been strengthened had there been a Program Coordinator whose duties were exclusively focused on Program. The PAU Coordinator, as third highest-ranking officer in CZMU, had significant duties and responsibilities to CZMU that negatively impacted ability to focus on CPI.

The lack of project financial administration program and lack of sufficiently detailed Programme code of accounts for good programme management and programme supervision.

**External Factors:**

High turn-over of property owners resulting in frequent changes to stakeholders, making the stakeholder participation process more difficult and resulting in changes to land use on properties abutting and abounding project sites, affecting social parameters of Programme (access).

**Regulatory Issues:**

- i) The definition of Set-Back Policy and the High Water Mark (HWM) resulted in a high water mark more seaward than the mark that has been used for the initial project design (in the case of Rockley to Coconut Court project, as result, CZMU was obliged to shift the boardwalk several meters seaward and lost around 340m<sup>2</sup> of beach area).
- ii) The definition of average mean tide contained in Section 32 of the CZMA should be corrected to ensure that private property reflect the waterline that occurs at the high tide between at the spring and the neap tide.
- iii) In addition, currently, HWM measurements are valid for a period of two years. Taking into account the fact that the time require for preliminary project design and construction may exceed two years, consideration should be given to extending the period of the HWM to five years;
- iv) The clause of the Integrated Coastal Management Plans regarding Set-Back Policy is being "retroactively" should be corrected to reflect actual policy, applied by CZMU.

## b. Borrower/Executing Agency Performance

### Risk Management (including fiduciary risk: procurement, disbursements)

During preparation of the CIP, a minor risk was identified, associated with potential conflict of interest from the CZMU, a mainly regulatory and advisory agency, overseeing the construction of coastal infrastructure. This potential conflict did not prove to be an issue during implementation, and was mitigated in two ways: (i) Through the contracting of an engineering firm for the design and supervision of the coastal infrastructure project; and (ii) through the contracting of an independent Quality Control Consultant and a Quality Assurance Consultant, as an addition check to ensure that construction and supervision standards were applied.

### Monitoring of Project Performance and Results

Public opinion surveys were not carried out as planned. It is recommended that a public opinion survey be commissioned and implemented in June 2010.

Borrower/Executing Agency			
<input type="checkbox"/> Highly Satisfactory (HS)	<input checked="" type="checkbox"/> Satisfactory (S)	<input type="checkbox"/> Unsatisfactory (U)	<input type="checkbox"/> Very Unsatisfactory (VU)

## c. Bank Performance

Bank Performance			
<input type="checkbox"/> Highly Satisfactory (HS)	<input checked="" type="checkbox"/> Satisfactory (S)	<input type="checkbox"/> Unsatisfactory (U)	<input type="checkbox"/> Very Unsatisfactory (VU)

## V. Sustainability

### a. Analysis of Critical Factors

The critical factors that contribute positively to the sustainability of the project are the institutional solidity and strong technical capacity of CZMU. Also, the quality of the materials (granite versus sandstone) and work will contribute to sustainability.

In regard to a cost-recovery-mechanism, the loan proposal document indicates the following: "The project investments are by their nature largely public goods. By enhancing public amenities and coastal security, property owners, hotel operators, tourist operators, tourists, and the public at large will all benefit from the investments. It will be very difficult to isolate the discrete benefits of the investments to specific groups. Furthermore, in Barbados, the coastal zone is public property. There are no private beaches and all beaches are open to the public. In this context, it will be difficult to implement a cost recovery system based on user fees.

In addition with, with regard to increased land value, the economic analysis of the programme assumed that all properties with a 750 meter radius would benefit from an increase in value. Nevertheless, in reality the majority of the CIP's coastal infrastructure investments were designed to provide mitigate coastal erosion and only impact those properties that immediately abut the

projects, and therefore property values have not been significantly affected by the projects. In addition, and belying the assumption that increased property taxes would contribute to the financial sustainability of the Programme, the Property Tax Office of Barbados does not calculate property value based on the quality of the shoreline infrastructure.

In light of the public good nature of the investments (and the public nature of Barbados' coastal areas) any cost recovery will probably have to be based on taxation. The investments will be treated as public goods that convey a broad set of improved public amenities and enhanced safety to residents and visitors. The area where taxation is likely to recover costs soonest is the land tax. Many coastal property owners should experience substantial windfall increases in the value of their properties as a result of the proposed investments (improved beach amenities, reduced threats of erosion, etc.). According to information provided from CZMU, coastal infrastructure projects do not affect property tax values. Therefore, property tax revenue will not increase as a result of the CIP.

Nevertheless, presently GOB is exploring other innovative financial mechanisms such as a possible landing fee on tourists, to be partially allocated for cost recovery and maintenance proposes.

Maintenance of Coastal Infrastructure Works: According to paragraph 7.02 of the Loan Agreement, "As investments are completed, the PAU will formally hand over responsibility for operation and maintenance to the Ministry of Public Works and Transport (MPWT)".

Nevertheless, CZMU has not handed over maintenance or operation to the Ministry of Public Works. The responsibility maintenance for these projects will remain with the Coastal Zone Management Unit for the following reasons:

- i) The coastal structures constructed as part of this programme does not require any operation by Ministry of Public Works; although because designs and used materials call for low maintenance effort;
- ii) It is far more efficient to have the funds for maintenance reside with CZMU, where the inspection is undertaken. Private contractor will be hired to complete the work to CZMU specifications and under CZMU supervision.

## **b. Potential Risks**

- i) Drainage channels are likely to become clogged with sand, which calls for more frequent cleaning actions;
- ii) High turn-over of property owner resulting in changes to land use on properties and projects sites, changes of stakeholders and social parameters of programme;
- iii) Lack of transparent priority criteria during selection process of projects.

## **c. Institutional Capacity**

- iv) As indicated above, the supervision responsibility of the investment projects remains with the CZMU and therefore will assume the future monitoring and maintenance of the works completed under the project. During the exit workshop the CZMU committed itself to fulfill the contractual requirement and to present to the Bank an annual maintenance report for the next five years.

## **VI. Monitoring and Evaluation**

### **a. Information on Results**

The following monitoring and evaluation information specified in the logical framework was not maintained by PAU:

- i) Monitoring of engineering progress was highly satisfactory. Three levels of quality assurance were provided by: (i) the Design and Supervision Consulting Firm; (ii) the Quality Assurance Consultants; (iii) the PAU with technical support of CZMU;
- ii) Public opinion baseline and follow-up surveys.

### **b. Future Monitoring and Ex-Post Evaluation**

- iii) A formally defined and approved ex-post evaluation protocol should be on place;
- iv) To ensure that impact indicators related to programme goals, purposes and results are SMART (specific, measurable, achievable, relevant and time-bound) and the methodology and responsibility for the collection, processing and presentation of indicators is clearly defined.

## **VII. Lessons Learned**

- a) A strong execution agency is critical to Programme success;
- b) Strong technical support for design and supervision is critical;
- c) To ensure adequate financial administration of the project, it is necessary to have a financial administrator that is knowledgeable of financial management of projects and familiar with the financial procedures of the IDB and adept at financial projections and accrual-based accounting and skilled in the use of a commercial financial software packages. Adequate financial administration is best ensured by having a dedicated Financial Administrator;
- d) The Bank should provide greater support to the Executing Agency in finding solutions to procurement issues as they arise;
- e) Project planning and project management documents should be prepared, including: Programme Implementation Manual; Annual Plan of Operations; Program Operations Manual. Program Project Reports should include information necessary to compare planned activities with achieved activities in each time period, permitting a succinct comparison of financial and physical progress;
- f) Investment programmes should be based on final designs. Alternatively, a Programme should include two phases: a design phase and a construction phase, which financing for the second phase tied to the benchmarks of completion of final design, planning approval; legally-documented access to work sites;
- g) Timelines for project execution need to consider all factors that affect implementation (approval, access, acquisition, procurement); including specific actions which are not within the control of CZMU/PIU (coordination with other government entities, necessary



approvals and permits, access agreements with property owners, taking into account the high rate of turn-over in coastal property; agreements with business regarding construction schedules);

- h) A coordination mechanism should be in place during planning and execution of coastal infrastructure projects, involving the main decision makers, such as NCC, Town Planning and SGO, to streamline the several processes required to initiate works; a Project Steering Committee could also be an effective mechanism to help ensure the transparency of decision-making;
- i) It is essential to identify all programme stakeholders and to analyze each stakeholder's potential impact or influence and identify ways to manage those impacts effectively. A formally-defined communications strategy should be developed based on and reflecting the results of a stakeholder analysis; a thorough risk management plan should define risk categories for each stage of the project cycle and be linked to the stakeholder communication strategy;
- j) All indicators used to measure the impacts and results of a Program and its projects must be SMART indicators (specific, measurable, achievable, relevant, time-bound). Indicators should be precisely defined;
- k) A monitoring program should be formally defined that describes the methodology and responsibility for the data collection required for the identified indicators. Quantitative baseline monitoring information and monitoring activities during implementation (impact evaluation plan) should be elaborated;
- l) The incremental cost of partially shutting down work to accommodate concerns of restaurant owners may be greater than the cost of compensating businesses to close during specific hours (e.g. lunch). On future projects, the incremental costs should be compared and, if comparable, consideration could be given to the provision of compensation to affected businesses.
- m) "Integrated designs" taking in account erosion and flooding control in coastal infrastructure projects should be considered in order to minimize cleaning / maintenance activities (e.g. drainage channels that are likely to become clogged);
- n) As indicated in Section V a) "Analysis of Critical Factors" fFor future coastal management projects, the cost recovery mechanisms identified in the CZMP should be reviewed. In addition, innovative financial mechanisms such as a possible landing fee on tourists should be discussed with GOB for cost recovery and maintenance proposes.



**Annexes:**

1. Minutes from the Exit Workshop
2. Borrower Evaluation
3. Final Evaluation Report (DRAFT);
4. Financial Statements March, 31<sup>st</sup> 2010



Barbados  
Coastal Infrastructure Program (CIP)  
(BA0019-1386/OC-BA)

Minutes of Exit Workshop  
Held in the Conference Room of the Blue Horizon Hotel, Barbados  
May 14, 2010

I. Agenda

9:00 AM	Opening Remarks and Welcome	Ms. Anneke Jessen Representative CCB/CBA
9:10 AM	Presentation of Draft Project Completion Report	Mr. Roger Daviss Pipe Consultant
10:00 AM	BREAK	
10:15 AM	Project Achievements / Results	Mr. Antonio Rowe Project Manager, CIP/CZMU
10:45 AM	Project Evaluation	Dr. Leo Brewster Director, CZMU
11:00 AM	Lessons Learnt	Mr. Roger Daviss Pipe Consultant
11:30 AM	Open Discussion	
12:00 PM	Closing Remarks	Ms. Sybille Nuenninghoff Natural Resources Senior Specialist, RND/CGY

Present were:

Dr. Leo Brewster	Director	Coastal Zone Management Unit
Mr. Antonio Rowe	Project Manager	Coastal Zone Management Unit
Mrs. Cheryl Morris- Skeete	Chief Project Analyst	Public Investment Unit
Mr. Rodney Payne	Chief Project Analyst	Public Investment Unit
Mr. Avery Green	Project Analyst	Public Investment Unit
Ms. Nicole Daniel	Project Analyst	Public Investment Unit
Mr. Steven Payne	Accountant	Brian F Griffith & Co
Ms. Anneke Jessen	Representative	Inter-American Development Bank
Ms. Sybille Nuenninghoff	Project Team Leader	Inter-American Development Bank
Ms. Cassandra Rogers	Lead Specialist	Inter-American Development Bank
Mrs. Janette Archer-Headley	Operations Sen. Associate	Inter-American Development Bank
Mr. Roger Daviss Pipe	Consultant CZMU	Independent

Regrets:

Mr. Siebert Frederick	Manager	Public Investment Unit
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## II. Welcome Remarks

- 2.1 The workshop was convened at 9:30 a.m. The Representative of the IDB in Barbados, Ms. Anneke Jessen gave a brief welcome to the participants and expressed the Bank's appreciation to the Executing Unit and the Public Investment Unit (PIU) for overcoming a number of hurdles in getting the project successfully implemented.
- 2.2 The Representative noted that the lessons learned from the Coastal Infrastructure Program will benefit other Bank financed projects, especially future projects of the CZMU.

## III. Discussions

- 3.1 Project Results: Mr. Roger Pipe, Consultant in charge of the final evaluation, as well as Mr. Antonio Rowe, Project Manager presented a PowerPoint summary of the salient features and events of the project from design through implementation to project completion and thereafter facilitated the discussion on the challenges of the operation, issues of sustainability and lessons learned.
- 3.2 There was unanimous agreement amongst workshop participants that the significant components of the project were implemented satisfactory and most of the significant project achievements related to its Development Objective (DO) are expected to be sustainable. The Draft of Project Completion Report (PCR) reflects adequately these results, the likelihood of its benefits being sustained, as well as the lessons learned for the design and implementation of futures operations.
- 3.3 Some of the main results, which were highlighted during the discussions, especially in terms of the Rockley to Coconut Court project, Hometown Beach Improvement project and Welches project (I) improved continuous waterfront access; (II) improved recreational areas, (III) new stable beaches; (IV) exposure by the CZMU team to state of the art coastal engineering design techniques; and (V) construction of 1.2 km of board walk at Rockley and 500m of concrete walkway constructed at Hometown Beach.
- 3.4 With respect to Institutional Strengthening of the CZMU, the project manager noted that training was provided in Geographic Information Systems upgrade and numerical and physical modeling.

## IV. Project Evaluation

- 4.1 The Director of the Coastal Unit recognized the work of Mr. Roger Pipe, the independent consultant contracted by the CZMU to undertake the final evaluation of the Coastal Infrastructure Program. The Director noted that Mr. Pipe demonstrated the capability to analyze, evaluate and describe the project results in the given political, social and economic context during execution. Therefore the findings of the final project evaluation are adequately presented in the project completion report.
- 4.2 The Director of the Coastal Unit also acknowledged that the CZMU have had a good rapport with the Bank during project execution, however, he noted that sometimes it was a challenge

when Bank personnel were changed and much time was spent trying to bring the new members up to speed with the project.

- 4.3 Dr. Brewster reiterated that this time around his team will be better prepared to contribute a more solid input into the project design of the upcoming loan

#### V. Lessons Learned

- 5.1 Project designs should be detailed in advance so as to reduce the level of uncertainty with regard to overall costs and access to land;
- 5.2 Timelines for project execution should consider specific actions which are not within the control of CZMU/PIU and involve other governmental units (such as NCC), necessary approvals and permits, as well as agreements with private businesses and land owners;
- 5.3 Need to ensure that all monitoring indicators are "smart" and that the methodology and responsibility for the collection, processing and presentation of indicators is clearly defined;
- 5.4 Procurement methods for special technical specifications of needed construction material (e. g. rocks and sand) should be discussed with the Bank before final acquisition.

#### VI. Closing Remarks

- 6.1 The Project Team Leader of the Bank gave a briefing on the rationale behind the IDB project completion reporting mechanism. She also informed that the final version of the PCR, upon approval by the Bank and the Borrower, would be available on the Bank's website for public viewing.
- 6.2 The Project Team Leader also reiterated the Borrower's contractual responsibility for the future monitoring and maintenance of the works completed under the project, that an annual maintenance report be presented to the Bank for the next five years after the last disbursement date of the financing.

Sybil W. Wainwright,  
Project Team Leader

Dr. Leo Brewster, Director  
Coastal Zone Management Unit

Project Name: COASTAL INFRASTRUCTURE PROGRAMME  
Executing Agency(ies): COASTAL ZONE MANAGEMENT UNIT

Date of Project Approval:

**Date of Contract Effectiveness:**

**Expected Date of Exit Workshop:**

## Probability on Achieving its Development Objective(s):

### Project Implementation:

### Sustainability of Project Results:

☒ Highly Probable (HP)      ☐ Probable (P)      ☐ Low Probability (LP)      ☐ Improbable (I)

**Comments:**

Performance During Project Preparation

Please rate your own performance during Project Preparation:

☐ Highly Satisfactory (HS)    ☒ Satisfactory (S)    ☐ Unsatisfactory (US)    ☐ Very Unsatisfactory (VU)

Comments:

During the initial preparation of this project the Project Execution Unit (PEU) had not been formed. This meant that the eventual staff of the PEU did not have the benefit of being involved in the project preparation. As a result the PEU had to become familiar with the project at the time of its implementation.

#### Borrower Performance During Project Execution

Please rate your own performance during Project Execution:

☐ Highly Satisfactory (HS)    ☒ Satisfactory (S)    ☐ Unsatisfactory (US)    ☐ Very Unsatisfactory (VU)

#### Comments:

The Programme had to be extended an additional two years in order to complete the project. In total the additional time taken to complete the three major projects, was the original time allotted in the programme. The delays experienced in this programme were not the fault of the Executing Agency but primarily due to the lengthy approval processes within Government, the need for contracts to be prepared, the need for land acquisition processes to be followed as well as the development of access agreements to traverse private lands in order to perform the works. These activities were outside the remit of the PEU and the CZMU and therefore relied on the relevant departments to execute their work in a timely manner.

It is must be noted that once the projects commenced they were completed, for the most part, on time and on budget.

#### Final Participation Survey - Project Management

Please rate the Bank's performance during project preparation. Factors to be considered include the extent to which the Bank facilitated a participatory project design, proposed adequate technical solutions to the problems identified, and responded to the needs of the Borrower (timeliness, selection of instrument type).

[ ☐ ] Highly Satisfactory (HS)    [ ☒ ] Satisfactory (S)    [ ☐ ] Unsatisfactory (US)    [ ☐ ] Very Unsatisfactory (VU)

Comments:



**Bank Performance during Project Supervision**

Please rate the Bank's overall performance during project supervision. Factors to be considered include technical assistance (including informal and formal training) to Executing Agency, timeliness of Bank response and the Bank's flexibility to respond to emergency situations during project implementation.

[ ☐ ] Highly Satisfactory (HS)    [ ☒ ] Satisfactory (S)    [ ☐ ] Unsatisfactory (US)    [ ☐ ] Very Unsatisfactory (VU)

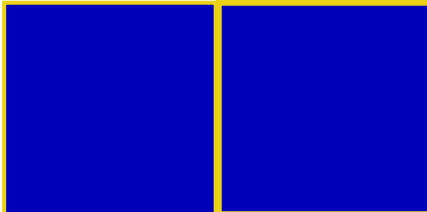
Comments:

Overall the Executing Agency and the Bank had a good working relationship. It must be noted that during the execution of the Programme the Bank did go through some re-structuring and as a result the Programme had four different infrastructural specialists. This meant having to bring each new person up to speed. This proved to be challenging when new persons did not fully appreciate the activities that had been occurring to get works going by both the IDB and the CZMU.

The Executing Agency also feels the Bank's country office should have more authority to make decisions on critical issues. This would reduce the time one has to wait for a no objection as these would not have to be referred to the Washington office.

**Additional Comments for Improving Bank Performance**

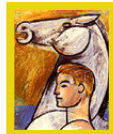
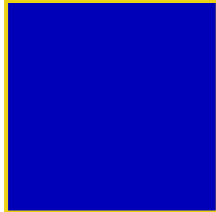
Additional comments/suggestions for improving Bank performance in the future.



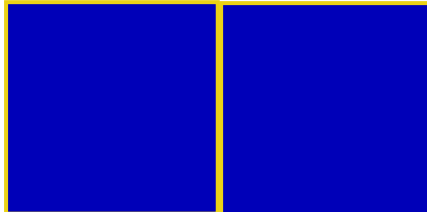
**Barbados  
Coastal Infrastructure Programme  
(BA-0019) LOAN 1386/OC-BA**



## **Final Evaluation**



**EQUUS Consulting**



**July 14, 2010**

**Barbados**  
**Coastal Infrastructure Programme**  
**(BA-0019) LOAN 1386/OC-BA**

**Final Evaluation**

Prepared by  
Roger Daviss Pipe

Prepared for  
Coastal Zone Management Unit  
Ministry of Environment, Water Resources & Drainage  
Government of Barbados

**DRAFT VERSION FOR DISCUSSION ONLY**

July 14, 2010

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**Abbreviations**

CCPIP	Coastal Conservation Pre-Investment Program
CIP	Coastal Infrastructure Programme
CZMP	Coastal Zone Management Plan
CZMU	Coastal Zone Management Unit
GOB	Government of Barbados
HWM	High Water Mean
IDB	Inter-American Development Bank
MPE	Ministry of Physical Development and Environment
NSPB	National Strategic Plan for Barbados
PAU	Project Administration Unit
PPC	Planning and Priorities Committee
PSC	Project Steering Committee
SMART	Specific, Measurable, Achievable, Relevant and Time-bound
TC	Technical Cooperation
TCP	Town and Country Planning
WBS	Work breakdown structure



# 1 INTRODUCTION

- 1.1 This document presents the findings of the final evaluation of the Coastal Infrastructure Programme, an investment programme that was implemented in Barbados by the Coastal Zone Management Unit between 2002 and 2009. The Programme was implemented with the Government of Barbados and reimbursable loan financing provided the Inter-American Development Bank.

## a) Objective of the Evaluation

- 1.2 The objective of the evaluation was to (i) determine whether the objectives, products and results, as well as the impacts described in the Programme Document and Logical Framework, were reached; (ii) identify the lessons learned and provide recommendations for future operations of a similar nature to be financed by IDB; (iii) evaluate and give an opinion on the role and performance of the project executing agency.
- 1.3 The evaluation took into account the relevance of the Project as well as its efficiency, effectiveness, sustainability and lessons learned. The following aspects were analyzed:
- i) Adequacy of Programme design and assumptions;
  - ii) Assess the degree of “evaluability” of the Programme to determine whether the goals and objectives clearly defined and were quantitative, measurable indicators included in the logical framework and project goals.
  - iii) Methodology used to identify and prioritize potential projects;
  - iv) Assess the monitoring and information gathering system that was put in place during Programme implementation, especially regarding outcomes;
  - v) Relevancy and applicability of the assumptions on which the project was based;
  - vi) Changes to in the environment affecting Programme implementation;
  - vii) Factors that contributed or thwarted achievement of the expected results;
  - viii) The effectiveness of the Programme in terms of the expected results in terms of quantitative and qualitative results identified in the project design documents. In the event that some goals and objectives were not reached, determine the root causes;
  - ix) The effectiveness of the Programme in terms of the results and, to the extent that it is possible to determine, the impacts. Determine how the Programme has contributed ensuring a healthy environment and continued economic development of Barbados through improved management and conservation of the coastal zone.
  - x) Determine how the impact of the Programme could have been improved;
  - xi) Review and assess the extent to which the terms and conditions specified in the contract were satisfied
  - xii) The efficiency of the Programme, in terms of the achievement of the projected indicators;
  - xiii) Sustainability. Assess the level of sustainability from a technical, financial and environmental perspective. Regarding financial sustainability, assess the validity of the assumption included

in the project design regarding cost recovery through the land tax, whereby many coastal property owners were expected to experience substantial windfall increases in the value of their properties as a result of the proposed investments (improved beach amenities, reduced threats of erosion, etc.). Explore other innovative financial mechanisms such as a possible landing fee on tourists. Regarding technical sustainability, review the effectiveness of the arrangement by which responsibility for maintenance was handed over to the Ministry of Public Works and Transport (MPT).

- xiv) Effectiveness of the interaction and relationship between the Executing Agency and the IDB country office and headquarters;
- xv) Adequacy of the Bank's establish inspection procedures;
- xvi) Lessons learned concerning: Programme design; project selection and prioritization; planning; implementation; resource allocation; procurement processes; monitoring of progress; reporting; interaction with stakeholders; role of the Bank; management and technical capacity of the executing agency; sustainability.
- xvii) Phase 2 design considerations.

#### **b) Evaluation Methodology**

- 1.4 The evaluation methodology consisted of three elements:
- 1.5 **Review of Programme Documentation:** The documents and reports generated by the Executor (Semester and Annual Reports, Annual Plans of Operation, technical documents, disbursement reports) were reviewed along with the consulting and Project reports. Likewise, the following documents were reviewed: the Project Contract, the Project Progress Monitoring Reports (PPMR); CZMU annual reports, the financial and economic analysis carried out during project preparation; Tourism statistics from the Ministry of Tourism; supervision reports by the firm hired to carry out periodic independent monitoring of the Project Management Consultant and the Civil Works Contractors; external audit reports.
- 1.6 **Site Visits and Interviews:** Site visits were undertaken of all of the projects that were included in the original design, to gain an initial understanding of the physical conditions for each site. In depth interviews were conducted with CZMU officials and IDB officials involved in the programme's implementation
- 1.7 **Stakeholder Survey:** an internet-based survey was carried out of property owners and businesses impacted by the coastal infrastructure projects completed under the Programme.

## 2 PROGRAMME SUMMARY

### a) Introduction

- 2.1 The Coastal Infrastructure Programme (CIP) was originally designed as a US\$24.2 million programme, including US\$17.0 million in loan financing from the Inter-American Development Bank as well as US\$7.2 financing from the Government of Barbados (GOB) that sought to support the sustainable development and improvements for shoreline preservation and management in Barbados in order to ensure a healthy environment and continued economic development for its inhabitants. The programme was designed to achieve this goal through the implementation of nine coastal infrastructure projects as well as institutional strengthening activities aimed at strengthening the Project Administration Unit (PAU) and the executing agency. The Programme was originally designed to be executed during 53 months between October 9, 2002 and April 9, 2007.
- 2.2 By its completion in December 2009, at a final cost of US\$30.3 million, the CIP had successfully implemented three coastal infrastructure projects and carried out a number of capacity-building activities that benefitted the PAU. The crowning achievement of the CIP was the construction of a 1.2 kilometre boardwalk, revetment and headlands project that stands out as a “best practice” in coastal resource management in the Caribbean. In all, the three projects successfully provide a total of two kilometres of protected shoreline and provide a combined total of four kilometres of continuous, safe access to the coast.

### b) Programme Background

- 2.3 The CIP was developed in response to the strategic focus of the GOB on enhancing environmental infrastructure and natural resources management. Reflecting this focus, the GOB introduced the 2005-2025 National Strategic Plan of Barbados (NSPB) which includes amongst its objectives the promotion and facilitation of the environmentally sustainable use of natural resources. One of the corresponding strategies is to ensure effective conservation of the island’s coastal and marine eco-systems and living resources, while improving their quality.
- 2.4 The Coastal Infrastructure Programme was consistent with the objectives and strategies of the IDB’s National Strategic Plan for Barbados which seeks, amongst other things, to strengthen the competitiveness of Barbados’ tourism product in recognition of the importance of tourism to Barbados’ economic progress.
- 2.5 The Coastal Infrastructure Programme was the fourth IDB-financed loan operation in Barbados in support of GOB efforts to implement coastal zone management in the country. Between 1983 and 1984, a Diagnostic and Pre-Feasibility Study of the island’s coasts was conducted by the GOB with financial support of the IDB. Two further programmes were subsequently supported through pre-investment loans: the Coastal Conservation Pre-Investment Programme (Loan 57110C-BA for US\$4.7 million) and the technical cooperation Coastal Conservation Programme Phase I (Loan 856/OC-BA for US\$3.6 million).

- 2.6 The Coastal Conservation Pre-Investment Program (1991 to 1995) focused on the west and south coasts and designed various engineering and non-engineering measures for beach creation, stabilization, and enhancement. Demonstration projects for beach improvement and protection were constructed at a cost of US\$3 million, of which the Bank contributed with US\$1.75 million. The programme also undertook environmental impact assessments of existing and proposed works, and prepared two Draft Bills for submission to Parliament-the draft Coastal Zone Management Bill and the Marine Pollution Control Bill. Another important output of the Programme was the preparation of the Coastal Zone Management Plan for the West and South Coasts. Additionally, engineering designs and a feasibility assessment for selected investments along the west and south coasts were developed.
- 2.7 Following the successful Coastal Conservation Pre-Investment Program, the GOB sought further assistance from the IDB in financing the first phase of a comprehensive, island-wide coastal zone management program, the Coastal Conservation Programme Phase I. Completed in 1999, this Technical Cooperation (TC) focused on diagnostic studies for the Atlantic Coast, to complement those previously conducted on the west and south coasts. This TC also prepared a detailed Coastal Zone Management Plan for the entire island, provided support to institutional strengthening efforts, and identified cost recovery mechanisms necessary for financing coastal management projects in Barbados. An important output of Phase I is the design and feasibility assessment of a package of capital works, submitted for the GOB consideration, which would form the basis of an investment phase program. The feasibility studies defined selection criteria through which the projects have been subsequently ranked for selection.

### c) Programme Objectives

- 2.8 The objective of the CIP was to support the sustainable development and improvements for shoreline preservation and management in Barbados in order to ensure a healthy environment and continued economic development for its inhabitants. The Programme comprised a range of coastal management works and activities related to four specific objectives: (1) shoreline stabilization and erosion control; (2) restoration of coastal habitats; (3) improve the amount of public coastal access; and (4) institutional strengthening for coastal management.
- 2.9 The development objective of the Programme was to ensure a healthy environment and continued economic development of Barbados through improved management and conservation of the coastal zone.

The Programme had the four specific objectives, as presented in Table 1:

**Table 1**  
**Specific Objectives**

Objective
1. To create and/or enhance the amenity value of beaches for local and tourist use through the implementation of shoreline stabilization and erosion control projects.
2. To restore and protect affected ecosystems through the implementation of coastal infrastructure recovery projects.
3. To encourage safe and increased access to the waterfront through coastal access improvement projects.
4. To upgrade capabilities and support the process of innovating coastal management, through the implementation of institutional strengthening activities for CMZU and the Ministry of Physical Development and Environment (MPE).

- 2.10 The programme comprised four Components; each component corresponding to one of the specific objectives:
- 2.11 **Component 1: Shoreline stabilization and erosion control.** The shoreline stabilization and erosion control engineering projects aimed to create and/or enhance the amenity value of beaches for local and tourist use, providing the catalyst for private sector investment in the rehabilitation of properties and infrastructure along the intervened section of waterfront.
- 2.12 **Component 2: Restoration of Coastal Habitats.** In recognition of the combined impact of man-made and natural events on degradation, damage and loss of valuable coastal and marine habitats and pressure, this Component included projects that were designed to contribute to the restoration and protection of important impacted ecosystems, including dune rehabilitation and water quality improvements.
- 2.13 **Component 3: Improvement of Public Coastal Access:** Activities aimed to encourage increased access to the waterfront through the establishment, where there is local interest and community support, of coastal foot-paths and new accesses.
- 2.14 **Component 4: Institutional Strengthening for Coastal Management.** The aim of this Component was to upgrade capabilities and support the process of innovation in coastal conservation. While the institutional framework for coastal zone management in Barbados was already considered to be quite strong when the Programme was formulated, this Component was designed to complement the on-going institution strengthening initiatives within the Ministry of Physical Development and Environment (MPE) to reinforce Barbados' system for integrated coastal zone management.

#### d) Programme Implementation Structure

- 2.15 The implementing agency of the CIP was the Coastal Zone Management Unit (CZMU) which established a small Project Administration Unit that was responsible for the Programme's implementation. At the outset of the Programme, CZMU was situated within the MPE. During implementation, the "home" of CZMU changed twice; ultimately it came to reside within the Ministry of Environment, Water Resources & Drainage.
- 2.16 A Project Steering Committee (PSC) was established to provide oversight to the implementation of the CIP. The PSC included a senior official of CZMU and Town and Country Planning.
- 2.17 An international coastal engineering (Design and Supervision) consultant firm was contracted to provide final designs for the nine projects and to supervise the implementation of the projects. The consulting firm used state-of-the art mathematical and physical models to validate and perfect the initial project designs that were the basis of the Loan Agreement.
- 2.18 Two local consultants were contracted by the PAU to provide independent quality assurance and quality control oversight of the coastal infrastructure projects.
- 2.19 The coastal infrastructure projects were constructed by engineering contractors contracted through international procurement processes and supervised by the Design and Supervision consultants.
- 2.20 The CZMU Accountant was to be responsible for the financial management of the Programme, including accounting and requesting IDB disbursements and the Programme was audited by an independent accounting firm contracted by CZMU.

### e) Programme Scope

#### Initial Programme Scope

2.21 As originally conceived, the Programme was to comprise nine coastal engineering projects as well as institutional strengthening activities for the implementing agency. Table 2 shows the planned costs for each project and the corresponding percentage in terms of overall planned investments.

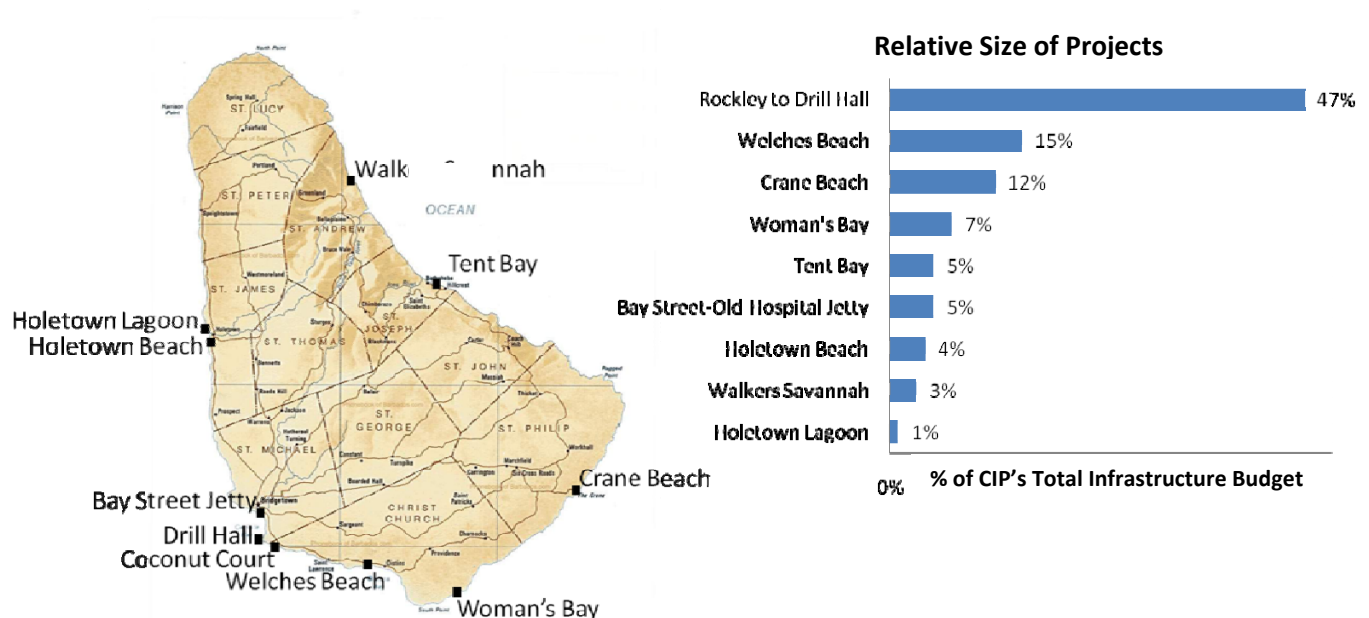
**Table 2**

**Initial Programme Structure**

Component	Projects and Activities	Planned Cost (US\$ Million)	% of planned investment costs
1. Shoreline Stabilization and Erosion Control	i) Rockley to Drill Hall – Waterfront Improvement	7.9	47%
	ii) Woman's Bay (Silver Sands)-Headland Protection	1.2	7%
	iii) Crane Beach, St. Phillip–Restoration & Enhancement	2.0	12%
	iv) Holetown Beach Improvement	0.7	4%
	v) Welches Beach Improvement	7.5	15%
2. Restoration of Coastal Habitats	vi) Holetown Beach–Lagoon Aeration System	0.2	1%
	vii) Walkers Savannah–Dune Restoration	0.5	3%
3. Improvement of public coastal access	viii) Bay Street-Demolition and Replacement of Old Hospital Jetty	0.8	5%
	ix) Tent Bay-Boat Access and Slipway	0.8	5%
4. Institutional strengthening for coastal management	a) Coastal Zone Management Unit (CZMU) equipment and technical support b) MPE staff training c) MPE strategic plan development d) MPE public education strategy development	0.3 (total component)	2%

**Figure 1**

**Location and Relative Size of the Original Nine Coastal Infrastructure Projects**



Final Programme Scope

- 2.22 The largest project – the Rockley to Drill Hall-Waterfront Improvement project, which constituted 47% of planned investment costs -- underwent significant design enhancements, as a the result of which a six metre wide boardwalk was incorporated into the project design, thereby broadening the project concept to include recreation in addition to coastal stabilization. The design change also reflected insights obtained through the application of state-of-the-art mathematical and physical modelling which revealed design flaws in the in initial design. As well, the length of the project was reduced from 2.25 kilometres to 1.2 kilometres. This reduction in length was due both to difficulties in acquiring private property as well as the increased unit cost resulting from the incorporation of the boardwalk into the project design.
- 2.23 Six of the nine coastal infrastructure projects were not implemented, including: Women’s Bay (Silver Sands) – Headland Protection; Crane Beach, St. Phillip-Restoration & Enhancement; Holetown Beach-Lagoon Aeration System; Walkers Savannah-Dune Restoration; Bay Street-Demolition and Replacement of Old Hospital Jetty; Tent Bay-Boat Access and Slipway. The reasons why these projects were not implemented were various:
- 2.24 **Womens’ Bay (Silver Sands) – Headland Protection project:** removed due to the detection of changed bathymetric conditions that would have required a higher-cost solution than budgeted, and also due to the findings of additional studies which revealed that the project would not benefit the public beach area, but rather only one private landowner. Thus, the astuteness of the Design and Supervision Consultants, together with CMZU support, resulted in the timely identification of issues that concerning the preliminary design and the priority ranking of the project.
- 2.25 **Crane Beach, St. Phillip-Restoration & Enhancement project:** implementation of the project was frustrated by land acquisition issues (the current access road was on private property). The project was further complicated by an unrelated legal dispute between the owner of the property at the Crane and the GOB.
- 2.26 **Holetown Beach-Lagoon Aeration System project:** during their review of the initial project design, the Design and Supervision Consultants identified that the initial design would not sufficiently resolve the issue of stagnant water that the project was intended to resolve. An opportunity to increase the effectiveness of the project was identified through additional hydrologic studies that were undertaken. The result was an enhanced design that included, in addition to the original aerator, a fluidizer system that would reduce the frequency of sand accumulation and the retention time of water in the drains and natural water course that terminate at the beaches along the coast of the Holetown Lagoon. The enhanced design changes were necessitated approval from Town and Country Planning. Final approval for the application to Town and Country Planning was obtained on June 30, 2009, by which date insufficient time remained to complete the project within the timeframe of the Programme implementation period. The decision was made to include this project in the follow-up investment programme to the CIP.
- 2.27 **Walkers Savannah-Dune Restoration project:** removed because the natural environmental recovery of this ecosystem, in tandem with effective prohibition by CZMU of sand mining in the area, made the project redundant. The alertness of CZMU and the PAU in monitoring the natural recovery process resulted in a cost savings of US\$0.5 million.

- 2.28 **Bay Street-Demolition and Replacement of Old Hospital Jetty project:** Removed at the request of GOB due to a down-grading in priority of the project. The old jetty was subsequently demolished and removed by GOB.
- 2.29 **Tent Bay-Boat Access and Slipway project:** Two international public competitive bidding processes were undertaken, both of which were declared non-responsive due to the receipt of only one acceptable bid on each occasion. Part of the difficulty in obtaining a large number of competitive bids was thought to be due to the technical complexity of the project design. A proposal was presented to undertake additional work to develop a modified design, however approval for the funds required for this work was not approved.
- 2.30 **Additional studies:** During the implementation of the CIP, the Design and Supervision Consultants undertook the following additional studies: the Woman's Bay bathymetric study; the Worthing Beach Monitoring Studies and Recommendations; the Coconut Court to Needham's Point Coastal Processes Investigation. The Woman's Bay study was undertaken to confirm the initial design after a data gathering exercise revealed that the offshore conditions were deeper than the initial design study had indicated. The other two studies were undertaken to gather data about the impact the beaches have on the project areas, and conversely gain a better understanding of how the Rockley to Coconut Court project would impact those areas.

Programme Costs and Dates

- 2.31 The Project was approved on 9 January 2002, entered into effectiveness 9 October 2002 and became eligible for first disbursement on 23 March 2003. The original date of final disbursement was 9 April 2007. This was extended by 32 months to 9 December 2009 (Table 3).

**Table 3**  
**Programme Costs and Dates**

<b>Original Programme Cost and Financing</b>	US\$24.2m IDB: US\$17million GOB: US\$8.2million
<b>Final Programme Cost and Financing</b>	US\$30.3 million IDB: US\$16.8 million GOB: US\$13.5million
<b>Board Approval:</b>	09 Jan 2002
<b>Loan Contract Effectiveness:</b>	09 Oct 2002
<b>Eligibility for First Disbursement:</b>	26 Mar 2003
<b>Original Date of Final Disbursement</b>	09 Apr 2007
<b>Current Date of Final Disbursement</b>	09 Dec 2009
<b>Cumulative Extension</b>	32 months

- 2.32 At US\$30.3 million, the final cost of the CIP was 25% higher than originally budget and the implementation period proved to be 60% longer than originally anticipated. The higher cost and longer implementation period were primarily due to the fact that the original cost and time estimates were based on preliminary project designs and underestimated the time required to complete and obtain approval for final project designs. In addition, the original time estimates underestimated the time required to carry out the international procurement process for coastal engineering services, to obtain throughway right-of-access to construction sites; and to complete



the purchase of private land required for one of the projects. The additional implementation period resulted in significantly increased costs for the supervisory services of the international consulting firm that was contracted to carry out the final project designs and provide supervision during their implementation. The longer implementation period also resulted in a higher total cost of the PAU.

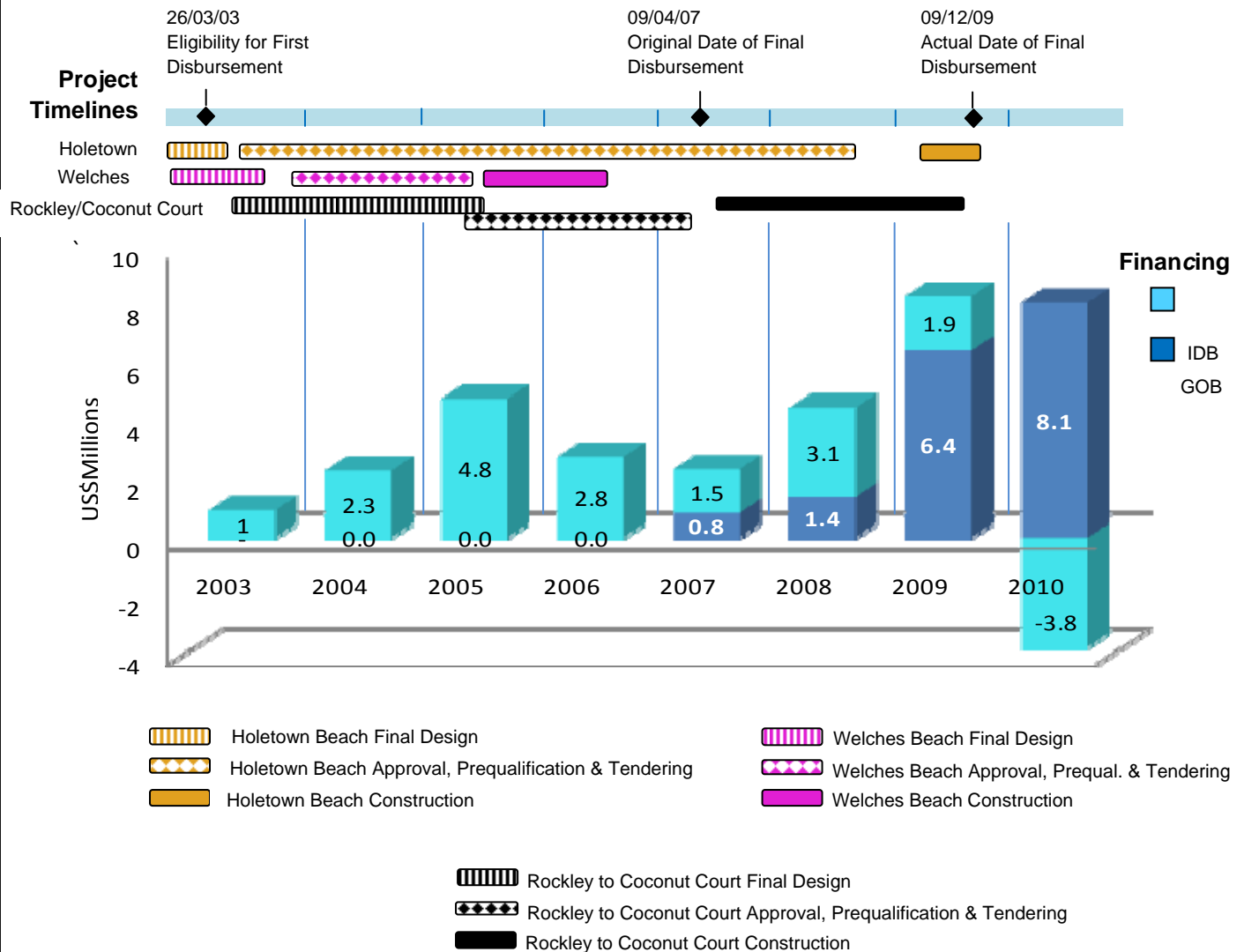
#### Programme Disbursements

- 2.33 Figure 2 shows the disbursement pattern for the Programme by year and source of financing, together with the project timelines for the three coastal infrastructure projects that were implemented during the CIP. For each project, timelines are shown for the activities related to: final design, approval, qualification and tendering; and construction.
- 2.34 From 2003 until 2006, the Programme was financed by GOB. During the first five years of the Programme, only US\$0.8 million of IDB financing was used.
- 2.35 The Welches Beach project was construction in 2005 and 2006 with GOB funds. The project was considered by IDB to be ineligible for financing with IDB funds because of issues related to the procurement process.
- 2.36 To facilitate disbursement, the IDB retroactively recognized VAT payments on construction costs and consulting services that had paid with GOB funds, resulting in a payment by IDB to GOB of US\$3.8 million in 2010.
- 2.37 The project timelines show that the approval, prequalification and tendering process took a total of 579 days for the Holetown Beach project, 360 days for the Welches Beach project, and 509 days for the Rockley to Coconut Court project.
- 2.38 The Town and Country Planning (TCP) approval process took an average of 145 days; this despite the fact that CZMU had correctly identified the length of time of the TCP project approval process as an issue and had included a TCP Senior Town Planner on the on the CIP Steering Committee.
- 2.39 The Holetown Beach project has the distinction of being the first project for which final design was completed (in 2003) and yet the last project to be constructed (in 2009). The long implementation period was primarily due to difficulties in obtaining construction access to the site through private property. Based on the expectation that right-of-way access to the construction site access would be obtained from the private land owner, the PAU initiated the pre-qualification process of bidders in accordance with the IDB procurement guidelines at the time (subsequently the requirement for pre-qualification was limited to projects with a cost of US\$10 million and higher). The pre-qualification process took nine months to complete but was ultimately rendered obsolete because construction access was not obtained, meaning that the procurement process could not be initiated. Consequently the 12 month validity period of the pre-qualification status expired. With the construction access problem still unresolved and the project stalled, the matter was brought to the attention of Cabinet and in 2005 the project came to the attention of the Planning and Priorities Committee (PPC), a committee of Cabinet. The PPC decided that the then Ministry of Housing, Land and the Environment should seek to acquire the land necessary to undertake the construction work. Six months later, however, the PPC proposed that one last attempt be made to resolve the issue without acquisition, and recommended a high-level meeting involving the two Ministers and the private land owner. The PPC also decided that the project would be postponed under after the Cricket World Cup in 2007. In June 2007 the high-level meeting took place and the private land owner agreed to provide access to the construction site for five months. This time period was inadequate, however, to complete the tender process

and undertake the construction and so various alternative options were explored. In the end, a second private property owner entered into a verbal agreement providing construction access to the project site. Based on this agreement the tender process was re-started, in January 2008, culminating in the presentation of three bids in May 2008. The tender review, selection and IDB no-objection process then took four more months to complete. A further delay resulted from a decision by the Ministry of Housing that Government would be required to enter into a formal Licence Agreement with the private property owners for construction access. Project construction finally began on March 2, 2009 and was completed on October 20, 2009.

**Figure 2**

**Project Timelines and Programme Disbursements**



**Table 4**  
**Disbursements by Year and Source (US\$ millions)**

	2003	2004	2005	2006	2007	2008	2009	2010	TOTAL
<b>IDB</b>	-	0.0	0.0	0.0	0.8	1.4	6.4	8.1	<b>16.8</b>
<b>GOB</b>	1	2.3	4.8	2.8	1.5	3.1	1.9	-3.8	<b>13.5</b>
<b>TOTAL</b>	<b>0.9</b>	<b>2.3</b>	<b>4.8</b>	<b>2.8</b>	<b>2.4</b>	<b>4.5</b>	<b>8.3</b>	<b>4.3</b>	<b>30.3</b>
<b>% Annual</b>	3%	8%	16%	9%	8%	15%	27%	14%	100%
<b>% Cumulative</b>	3%	11%	27%	36%	44%	58%	86%	100%	

#### **f) Validity of Project Logic**

- 2.40 The logic behind the CIP was that tourism is a mainstay of the Barbadian economy and that the quantity and quality of beaches in Barbados are a key factor in the decision of tourists to choose Barbados as a tourist destination. The coastal zone and beaches are prone to erosion and coastal infrastructure is a mechanism to mitigate erosion, increase access to the coast, and protect public and private property. Given the economic importance of the tourism sector the CIP was seen as a key strategic investment to preserve and enhance coastal amenities. This logic remained valid throughout the implementation period of the CIP and continues to hold true for the foreseeable future.
- 2.41 The economic context of the project changed in light of the global economic recession of 2008-2010 which lead to a 10% decline in tourist/visitor arrivals compared with 2007; a decline greater even than the 7% decline that followed the events of September 2001. These fluctuations and declines following economic downturns have negatively impacted the tourism industry, resulting in increased competitive pressure for Barbados to maintain and enhance its tourism product in order to successfully compete with a reduced regional and global demand for tourism. Thus, the economic justification of the Programme as a means to maintain and improve beaches and beach access takes on an even greater importance compared to when the Programme was conceptualized.

#### **g) Programme Sustainability**

##### Cost-Recovery Mechanisms

- 2.42 As stated in the Loan Proposal document,
- 2.43 “The project investments are by their nature largely public goods. By enhancing public amenities and coastal security, property owners, hotel operators, tourist operators, tourists, and the public at large will all benefit from the investments. It will be very difficult to isolate the discrete benefits of the investments to specific groups. Furthermore, in Barbados, the coastal zone is public property. There are no private beaches and all beaches are open to the public. In this context, it will be difficult to implement a cost recovery system based on user fees.
- 2.44 In light of the public good nature of the investments (and the public nature of Barbados’ coastal areas) any cost recovery will probably have to be based on taxation. The investments will be treated as public goods that convey a broad set of improved public amenities and enhanced safety to residents and visitors. The area where taxation is likely to recover costs soonest is the land tax. Many coastal property owners should experience substantial windfall increases in the

value of their properties as a result of the proposed investments (improved beach amenities, reduced threats of erosion, etc.)”<sup>1</sup>.

- 2.45 According to information provided to CZMU by an official from the Land Tax, the coastal infrastructure projects do not affect property tax values. Therefore, property tax revenue will not increase as a result of the CIP. This means that there is not cost recovery mechanism in place.

Maintenance of Coastal Infrastructure Works

- 2.46 According to paragraph 7.02 of the Loan Agreement, “As investments are completed, the PAU will formally hand over responsibility for operation and maintenance to the Ministry of Public Works and Transport (MPWT). Upon completion of the investment, the Borrower will notify the Bank the date when MPWT will assume responsibility for the operation and maintenance of the investment, subject to regulation by the CZMU, Town and Country Planning Office, and other relevant authorities. The CZMU will maintain responsibility for monitoring the status of the investments and for making recommendations for periodic maintenance to the MPWT”.
- 2.47 CZMU has not handed over maintenance or operation to the Ministry of Public Works. The responsibility maintenance for these projects will remain with the Coastal Zone Management Unit for the following reasons:
- i) The coastal structures constructed as part of this programme does not require any operation by Ministry of Public Works;
  - ii) Given the volume of work undertaken by the Ministry of Public Works it would put tremendous strain on the financial resources, their equipment and operators should they have to undertake the maintenance of coastal structures;
  - iii) It is far more efficient to have the funds for maintenance reside with CZMU, where the inspection is undertaken. Private contractor will be hired to complete the work to CZMU specifications and under CZMU supervision.
- 2.48 According to the detailed Programme’s detailed finance spreadsheets, as of June 1, 2010 CZMU had not paid any maintenance costs on any of the three projects constructed under during the CIP.

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<sup>1</sup> Loan Proposal, p 32.

### 3 PROGRAMME PREPARATION AND DESIGN

3.1 This section presents the findings of the evaluation regarding the programme preparation and design. The review of programme design sought to answer the following questions:

- Did the design of the programme take into account the reality and priorities of the country, in such a way so as to help ensure the execution of the project?
- Did the design of the programme considered the existence of competitive and complementary projects financed by other entities or by the government?
- Was the logical framework model (logframe) adequately structured; were the indicators SMART (specific, measurable, achievable, relevant and time-bound); were the means of verification adequate; were the assumptions thorough; and were the contents of the logframe developed with adequate stakeholder consultation;
- Whether cost and time estimates were accurate and realistic and whether sufficient financial resources were included in the Programme budget to achieve Programme goals.

#### a) Reality and Priorities

- 3.2 The design of the programme did take the reality and priorities of the Government of Barbados into account, as evidenced by the fact that one of the strategies of the 2025 National Strategic Plan of Barbados (NSPB) is to ensure effective conservation of the island's coastal and marine ecosystems and living resources, while improving their quality. Furthermore, the coastal infrastructure projects included in the CIP were prioritized based on the technical and political criteria that were developed in 1995 as part of the Coastal Conservation Pre-Investment Program (CCPIP).
- 3.3 The prioritization criteria constituted a fairly objective and reasonably transparent way of prioritizing various coastal zone infrastructure projects, and were consistent with the Coastal Zone Management Plans subsequently developed under the CCPIP.
- 3.4 A caveat regarding the prioritization criteria is that they contain a methodological error (this point is discussed in Section f, below) the resolution of which would, perhaps, have affected the prioritized ranking.

#### b) Competitive and Complementary Projects

- 3.5 When designing investment programmes it is important to take into account any competitive and/or complementary projects, financed by other entities or by the government, which may impact positively or negatively on the programme's implementation by competing for scarce engineering or material resources.
- 3.6 One of issues encountered by the PAU during the implementation of the CIP was a low number of proposal tenders in response to the smaller international competitive bids; a reflection of the

relatively small number of eligible engineering consulting firms that are interested in bidding on such projects. The simultaneous implementation of other coastal engineering projects in Barbados and in the region would have further accentuated this constraint.

- 3.7 A potential constraint for the smooth implementation of an investment programme such as the CIP is the availability of key materials used in the projects. Two key materials for the CIP projects were armour stone and sand. Other coastal infrastructure projects would also require these materials and the added demand could affect availability and/or price.
- 3.8 At the time of preparation of the CIP there were no other projects underway or being planned that would have directly competed with the Programme. Shortly after the approval of the Loan Agreement, however, the Barbados Port Authority commenced implementation of the Port Expansion and Renewal Project (PERP), a multiyear project that required significant quantities of armour stone. On the positive side, The PERP also provided a source of suitable sand for the CIP, the result of dredging activities in 2002 to deepen the main approach channel and the inner harbour.
- 3.9 Another event that affected the CIP was the awarding to Barbados of the 2007 World Cricket competition. The preparatory activities involved several large infrastructure improvement projects that competed for engineering resources, albeit not specialized in the area of coastal infrastructure. Indirectly, however, the World Cricket competition impacted the CIP when the Planning and Priorities Committee (PPC) instructed CZMU to postpone start-up of construction on the Holetown Beach project.
- 3.10 Neither the port project nor the cricket-related projects were on the radar screen when the CIP was developed, so that on the one hand they could not have been taken into account during the design of the CIP. On the other hand, one of the challenges of risk analysis is to identify events that might occur that would negatively affect the programme, and to come up with mitigation measures that will reduce those impacts should those events occur.
- 3.11 **Conclusion:** Although no competing projects existed when the CIP was being prepared, a thorough risk analysis should have taken into account that possibility that new projects might eventually compete for key resources such as armour stone. Moreover, a thorough risk analysis would have identified the availability of suitable armour stone as a constraint and might have proposed the bulk purchase of armour stone as a risk-mitigation measure, which was a solution that was ultimately recommended during implementation by the Design and Supervision Consultants.

### c) Stakeholders

- 3.12 Stakeholders are people or organizations whose interests may be positively or negatively impacted by the programme. They also include those who could exert positive or negative influence over the project who would not otherwise be considered stakeholders. The stakeholders of the CIP may be divided into two groups: private sector and governmental.
- 3.13 Governmental stakeholders at the time of project preparation included: the CZMU including the PAU; the Ministry of Physical Development and the Environment (now the Ministry of Environment, Water Resources and Drainage); the Public Investment Unit; the Ministry of Public Works and Transport; the Ministry of Planning including Town and Country Planning; the Ministry of Housing and Lands; the National Conservation Commission (NCC); and the Soil Conservation

Unit (the Government Agency responsible for the management of the Scotland District where the Walker's Savannah Dunes are situated).

- 3.14 Private sector stakeholders included: the owners of property abutting the CIP coastal infrastructure projects, the owners of land that would need to be acquired for the projects to be constructed; the engineering consulting firms that constructed the projects; the Design and Supervision Consultants; the Quality Assurance and Quality Control Consultants; the suppliers of armour stone and sand purchased under the CIP; and the suppliers of CZMU equipment and technical support.
- 3.15 During the implementation of the CIP, two other stakeholders that became involved with the Programme were: the Planning and Priorities Committee (a parliamentary committee that became involved with regard to the construction site access/land acquisition issue at the Hometown Beach project); and the Barbados Port Authority, which sold US\$1 million worth of sand to CZMU for the CIP.
- 3.16 The development of the original framework model (logframe) was led by the IDB project team and included the participation of officials from CZMU, the Ministry of Physical Development and the Environment, and officials from the Project Implementation Unit. Private sector stakeholders (i.e. private property owners) were not consulted during the development of the logframe or, for that matter, during the design of the CIP.
- 3.17 What could have been gained from a more extensive stakeholder consultation during the development of the programme design? Had the owners of properties abutting the project site been consulted, the construction access problem might have been identified earlier on. However, this benefit would have been offset by the risk of engaging private property stakeholders before the final project designs were completed including the architectural drawings of the proposed projects that were a key and necessary part of the communication strategy. Also, given the high rate of property turnover, any tentative acquiescence to allow site access would have been limited in value.
- 3.18 Land acquisition is a complicated issue and coastal land acquisition is particularly problematic. Be that as it may, for coastal infrastructure projects that require the acquisition of private land, it is essential to obtain political agreement to the acquisition during the Programme design phase. Of course, that is easier said than done. It is appealing to imagine that an efficient process could be agreed upon between the Ministry of Environment, Water Resources & Drainage on the one hand and the Ministry of Housing and Land regarding the acquisition of land for coastal infrastructure projects. Since the projects have been identified based on technical, social, economic and political criteria, and since the projects are consist with the Coastal Zone Management Plan (that has yet, it should be pointed out, to be approved by Parliament).
- 3.19 Had there been better communication with Town and Country Planning during programme design, it would have been possible to identify that, notwithstanding the presence of a Senior Town Planner on the Project Steering Committee, the approval process by Town and Country Planning would not be shortened. This would have been useful information that would have made it possible to plan the projects based on more realistic timelines. .
- 3.20 **Conclusion:** The stakeholder consultation process during programme design was adequate to ensure ownership of the programme by the CZMU as Executing Agency, but was not adequate to ensure that all stakeholders – notably private property owners -- were on-board with regard to the objectives and activities of the Programme.

- 3.21 **Recommendation:** it is essential to identify all programme stakeholders and to analyze each stakeholder's potential impact or influence and identify ways to manage those impacts effectively. Classification tools such as power/interest grids and salience models can be used to group stakeholders by qualifications like authority level, impact or influence, or requirements. These classifications can then help the project manager determine how, what, and when to communicate with each stakeholder. This will serve as the basis for developing a stakeholder register, a stakeholder management strategy and a communication plan for the Programme.

**d) Adequacy of the Logical Framework Model**

- 3.22 The logical framework models of the CIP were reviewed to determine the soundness of the logic linking the Programme outputs to the programme purpose, and linking the programme purpose to the Programme goals. The adequacy of the indicators at all three levels (Goal, Purpose and Components) was reviewed to assess whether the indicators were SMART indicators (Specific, Measurable, Achievable, Relevant and Time-bound).
- 3.23 During the CIP two logical framework models were developed: the original logical framework developed during programme preparation in 2002; and a revised logical framework that was developed in 2007.

The original logical framework model (2002)

- 3.24 In the 2002 logframe the stated Programme goal was "to ensure a healthy environment and continued economic development through improved management of the coastal zone". The stated Programme purpose was "to support priority investments for shoreline stabilization, coastal ecosystem recovery, coastal access improvement and institutional development". The stated Programme outputs were: (i) construction of coastal infrastructure to protect beaches waterfront facilities; (ii) recovery of two important coastal ecosystems; (iii) improvement of safe access to the shoreline for leisure and economic activities; and (iv) strengthening of the MPE.
- 3.25 The logical connection between the Programme outputs and the Programme purpose is strong. In fact it is tautological, since by definition the successful construction of coastal infrastructure projects would constitute support for priority investments for shoreline stabilization coastal ecosystem recovery, coastal access improvement. We know that the CIP projects were priorities because they were identified as such using the prioritization criteria developed in the 1991 to 1995 Coastal Conservation Pre-Investment Program.
- 3.26 The indicators at the Programme purpose level included: (i) no further decline in coastal and marine environmental quality in areas of direct project influence; (i) increased land value accumulated US\$5.5 million accrued by 2006 of properties in areas of direct project influence (750 m. radius); and (iii) increased revenue from tourist stay-over visits of US\$7.5 million by 2006 (750 m. radius). The Programme purpose indicators were not SMART in the sense that they were neither achievable nor, strictly speaking, relevant.
- 3.27 Only one of the coastal infrastructure projects (Holetown Beach-Lagoon Aeration System) could have had any plausible impact on marine environmental quality. This was the smallest project, representing only 1% of the original planned investments, and would at best have had an imperceptible impact on marine environmental quality. Therefore the indicator was not achievable. The remaining projects were not designed to have any positive impact on marine environmental quality. Therefore, for 99% of the Programme, the indicator was not relevant.



- 3.28 With regard to increased land value, the logical framework erroneously assumed that all properties with a 750 meter radius would benefit from an increase in value. This assumption, which was a foundation of the economic analysis for the Programme, was based upon the erroneous assumption that the CIP projects would create new beaches equivalent in quality to Rockley Beach. In reality the majority of the CIP's coastal infrastructure investments were designed to provide mitigate coastal erosion and only impacted those properties that immediately abut the projects. Furthermore, experience since the Programme's completion has revealed that property values have not been significantly affected by the projects. Indeed, the Property Tax Office does not calculate property value based on the quality of the shoreline infrastructure (belying one of the assumptions that increased property taxes would contribute to the financial sustainability of the Programme).
- 3.29 Regarding the third indicator (increased tourist stay-overs) even the combined effect of all nine coastal infrastructure projects could not have been realistically expected to have a demonstrative impact on the number and/or duration of tourist stay-overs. Had all the projects been implemented, they would have contributed to maintaining and enhancing Barbados coastal resources and tourism product. However, from the tourist's perspective the erosion and degradation that would have occurred without the projects would have been gradual and imperceptible in the short to medium run. It was implausible to posit that by 2006 the Programme's impacts would have increased revenue from tourist stay-over visits.
- 3.30 At the level of Programme goal the logframe includes two indicators: (i) full public adoption and implementation of the CZMP by the end of 2003; and (ii) full compliance with land use policy by 2004.
- 3.31 **Conclusion:** Both versions of the logical framework model are well defined at the output level, but the indicators that were defined for at the Purpose-outcomes level and the Goal-impacts level were either not well enough defined or were not relevant or realistic. The logical framework model is the touchstone for assessing the success of a project. The success of a project should be gauged principally upon the extent to which it achieves the intended purpose and contributes to the intended goal. If the purpose and goal indicators have been poorly defined, however, then they are a less useful measure of the project's success.
- 3.32 **Recommendation:** It is essential that all performance indicators for the Programme be carefully constructed to ensure that they are specific, measurable, achievable, relevant and time-bound.

#### e) Soundness of Planning

- 3.33 Sound project management requires thorough scope management and sound time management planning. To help ensure sound project management the following documents should be prepared at prior to or at the outset of the implementation period: a scope management plan, a work breakdown structure (WBS); and a network diagram showing the sequence of programme activities. Based on these three things, a critical path can then be developed. The critical path of the project is the longest duration path through a network diagram and determines the shortest time to complete the project. Ideally, a critical path would have been developed for each of the nine infrastructure projects that originally comprised the CIP.
- 3.34 A formal scope management plan, WBS, network diagram and critical path were not developed for the CIP.

- 3.35 In terms of time-management tools, one the deliverables of the engineering design and supervision firm, W.F. Baird & Associates Coastal Engineers Ltd, was the development of activity/time schedules were developed for the following infrastructure projects: Women's Bay, Welches, Holetown Beach, Rockley to Drill Hall, Holetown Lagoon, Walker's Savannah, and Tent Bay. Detailed schedules were prepared for each project, showing in form of Gantt chart the time lines relating to the development of final designs, physical and mathematical model studies, workshops (project workshops and public consultations), permitting and construction (including environmental monitoring during construction). The Gantt charts were develop in Microsoft Project and presented as an Annex to the First Progress Report presented by Baird<sup>2</sup>. They constitute the only time management tool that were used on the CIP.
- 3.36 Although a critical path was not formally developed for the CIP, it is instructive to evaluate whether the Gantt charts would have provided a sound basis for identifying the critical path. In order to evaluate this, two aspects should be considered: whether the Gantt charts included all of the key activities required to complete the project, and the degree of accuracy of the estimated timelines presented in the Gantt charts.
- 3.37 The principal factors that caused delays in the implementation of the CIP were: obtaining throughway permission on private property in order to access project construction site; the approval process (involving Town and Country planning and the Inter-American Development Bank); the land acquisition process; and the tendering process.
- 3.38 Of the eight project schedules, only the schedule for the Crane beach project included property issues as a specific task. Access to construction sites was not presented as a specific task for the other projects. The tendering process was included for all projects, but was unrealistically optimistic and did not take into account the pre-qualification process. The approval process was included for all projects, but was over optimistic.
- 3.39 Figure 3 presents a comparison of the planned time and actual time for key activities for the projects that were completed (Welches Beach, Rockley to Coconut Court, Holetown Beach) or for which final design and approval was obtained (Crane Beach and Holetown Lagoon). The planned time is shown by the black lines imposed on each time bar. Time bars without black lines correspond to activities that were not considered in the Gantt charts.
- 3.40 Table 5 presents the information in tabular format and shows the duration variance. On average the final design process took 356 calendar days longer than originally planned. The review and approval process took 171 calendar days longer than originally planned; the pre-qualification and tendering process took 283 days longer; the construction process took 213 calendar days longer than originally planned. The average duration variance for all tasks was 207 days.
- 3.41 The time required to complete the pre-qualification and tendering processes were severely underestimated.
- 3.42 The estimate of activity durations for the CIP was done using one-point estimates. A one-point estimate involves the estimation of a single target date for completion of the activity or task. The estimation One-point estimates should only be used for projects that do not require a detailed, highly probable schedule. A more thorough methodology would have been to use a three-point estimate (PERT analysis, Programme Evaluation and Review Technique).

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<sup>2</sup> Baird, June 16, 2003

- 3.43 No project implementation plan or annual plans of operation were prepared, in which the critical path might have been included.
- 3.44 **Recommendation:** To strengthen the planning and design of future investment programmes, the following planning documents should be prepared as part of programme preparation: (i) a scope management plan; (ii) a work breakdown structure (WBS); a network diagram showing the sequence of programme activities; (iv) a critical path for each of the projects comprising the Programme; (v) a Programme Implementation Plan; and (vi) Annual Plans of Operation.

**f) On the Prioritization Coastal Infrastructure Projects**

- 3.45 The nine coastal infrastructure projects that were included in the CIP were selected for inclusion in the Programme based on a prioritization methodology that was included in the 1995 Delcan study. The methodology consisted of 12 variables. For each variable, potential projects were ranked from 1 to 3, corresponding to low, medium and high impact. The total score of each project was obtained by summing the scores obtained for each variable.
- 3.46 The methodology represented an attempt to prioritize coastal infrastructure investments based on transparent criteria. One weakness of the methodology was that it did not include variables that measured the relative impact of the projects in terms of value of property or number of beneficiaries that would benefit from the projects. Also, the methodology included an indicator called “Political importance”. This particular variable sought to reflect whether the project was of political importance. It is the opinion of this evaluation that such a variable diminishes the technical and transparent nature of the methodology. The purpose of the methodology should be to prioritize alternative investments based on objective and clearly defined criteria. An indicator such as “political importance” fails the test of technical transparency because it is based on a subjective measure of the political support or political demand for the project. Furthermore, inclusion of the political importance variable results in double-counting, since presumably the degree of political support for a project is at least partially correlated to some of the indicators. It would be more transparent and objective to include additional variables that are correlated to political support, such as the number of direct beneficiaries or the value of property that would benefit.
- 3.47 Despite these weaknesses, the Delcan methodology was a good attempt to prioritize alternative investments based on technical criteria. The nine CIP coastal infrastructure projects all were identified in this study. It should be pointed out that the methodology has not been updated and the prioritization process has not been repeated since the initial study in 1995. Yet the changing nature of the coastal environment necessitates the periodic updating of investment priorities. CZMU points out that, over the long run, the coastal zone of Barbados tends to remain the same and that therefore the priority areas in terms of erosion tend to be fairly constant. On the one hand, there is a certain logic and soundness to the argument that projects that were considered to be priorities fifteen years ago remain priorities today. On the other hand, since the work of CZMU is literally based on shifting sands and from time to time new areas of priority arise due to storm events and changing oceanographic conditions, it is important that CZMU periodically update its list of priority projects. Certainly as part of the preparation of an investment programme, the priority list of projects should be validated and, if necessary, updated to reflect new priorities.
- 3.48 **Recommendations:** Building upon the Delcan prioritization methodology, the Coastal Infrastructure Prioritization methodology should be revised by CZMU to resolve the methodological issues. It is important that the methodology should be transparent, easy to understand (for explanation to stakeholders) and based on clearly defined, objective criteria. Also,

CZMU should develop a standardized approach for the cost-benefit analysis of alternate investment projects. All projects should be subject to cost-benefit analysis as part of the prioritization process, but the methodology used in the cost-benefit analysis must make sense and should be approached from a “business case” perspective by presenting the argument (or “case” as the word is used in a legal context) for the investment to be made. The economic argument or case must be presented in a language that is geared towards the decision-making stakeholders. As a standard operating procedure, CZMU should periodically revise and update the list of investment priorities.

**g) Other Issues**

Access to coastal zones

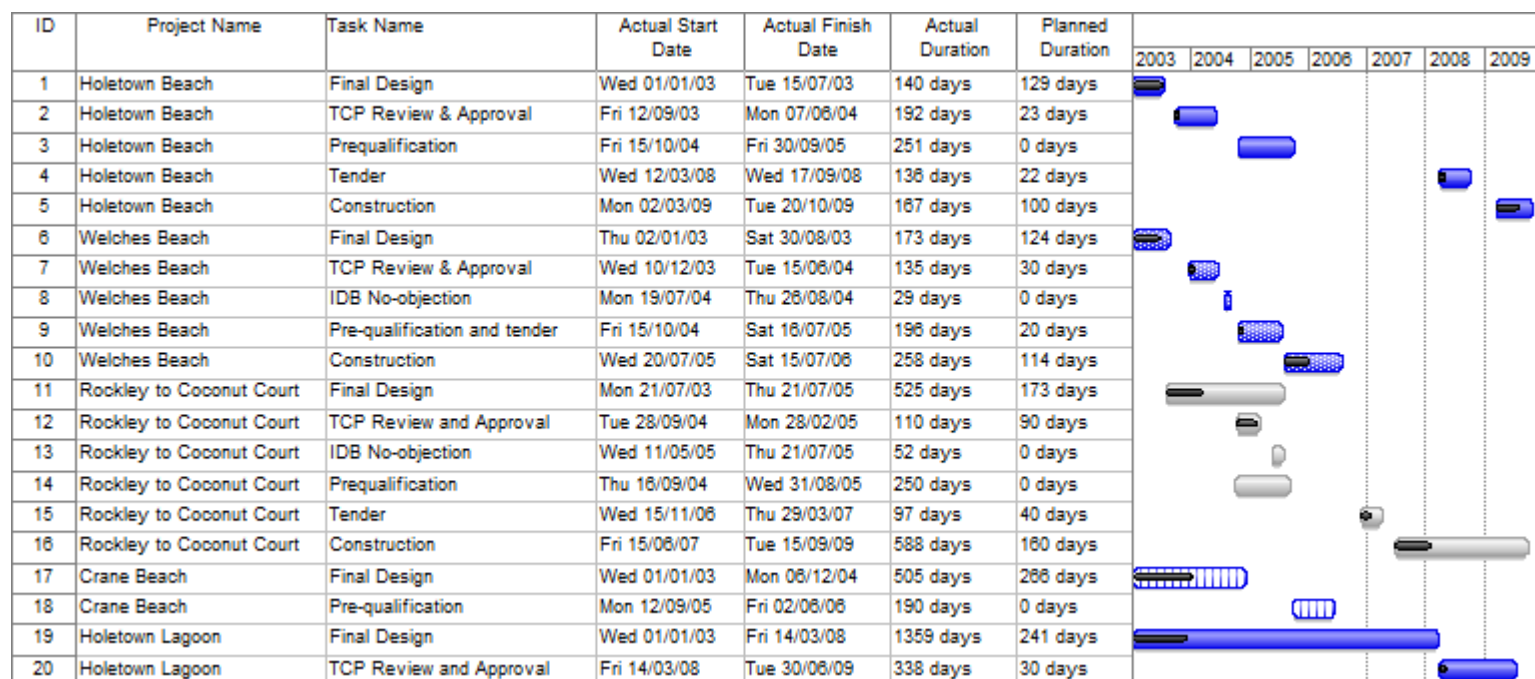
- 3.49 **Recommendation:** The Coastal Zone Management Plan identifies access to coastal areas as a priority concern in the coastal zone management of Barbados. Access to the coast may be defined in the following ways: i) lateral access (access along the shoreline); vertical access (physical access to the shoreline); ii) co-lateral access (related to the presence of co-lateral infrastructure such as parking facilities); iii) visual access (an open view to the ocean from the road); and iv) socio-economic access (related to the conditions for the enjoyment of all socio-economic segments of society to a beach or other coastal area). The CIP succeeded in extending the lateral access to coastal areas. For projects that include increased coastal access as a performance indicator, the type of coastal access should be specifically identified.

Property Turnover Rate

- 3.50 The high rate of property turnover in Barbados is a factor that affects the stakeholder communication strategy, the right-of-way issue to construction sites, as well as the access to coastal zones. During the CIP, a significant percentage of properties changed owners or long-term business renters. This lack of continuity in owners makes the communication strategy of CZMU more difficult, since efforts to explain the projects and issues to property owners needed to be repeated. Furthermore, new owners or renters might have different concerns from the original owners/renters that may have participated in stakeholder meetings at earlier stages of the project. Similarly, changes in ownership hindered (in the case of the Holetown Beach project) the efforts to obtain right-of-way access to the construction site.
- 3.51 **Recommendation:** the risk assessment analysis undertaken during project preparation should include the high property turnover rate as an issue that may impact stakeholder buy-in as well as affect construction access. The stakeholder communication strategy should take into account the possibility of property turnover and include a description of communication process that will be used to try to address possible concerns and bring new property owners on-board.

Figure 3

## Comparison of Planned Duration with Actual Duration



**Table 5**  
**Time Duration Variance**

Project	Activity	Actual Finish Date	Actual Finish Date	Planned duration	Actual duration	Duration variance
<b>Holetown Beach</b>	Final Design	01-Jan-03	15-Jul-03	129 days	140 days	11 days
<b>Holetown Beach</b>	TCP Review & Approval	12-Sep-03	07-Jun-04	23 days	192 days	169 days
<b>Holetown Beach</b>	Prequalification	15-Oct-04	30-Sep-05	0 days	251 days	251 days
<b>Holetown Beach</b>	Tender	12-Mar-08	17-Sep-08	22 days	136 days	114 days
<b>Holetown Beach</b>	Construction	02-Mar-09	20-Oct-09	100 days	167 days	67 days
<b>Welches Beach</b>	Final Design	02-Jan-03	30-Aug-03	124 days	173 days	49 days
<b>Welches Beach</b>	TCP Review & Approval	10-Dec-03	15-Jun-04	30 days	135 days	105 days
<b>Welches Beach</b>	IDB No-objection	19-Jul-04	26-Aug-04	0 days	29 days	29 days
<b>Welches Beach</b>	Pre-qualification and tender	15-Oct-04	16-Jul-05	20 days	196 days	176 days
<b>Welches Beach</b>	Construction	20-Jul-05	15-Jul-06	114 days	258 days	144 days
<b>Rockley to Coconut Court</b>	Final Design	21-Jul-03	21-Jul-05	173 days	525 days	353 days
<b>Rockley to Coconut Court</b>	TCP Review and Approval	28-Sep-04	28-Feb-05	90 days	110 days	20 days
<b>Rockley to Coconut Court</b>	IDB No-objection	11-May-05	21-Jul-05	0 days	52 days	52 days
<b>Rockley to Coconut Court</b>	Prequalification	16-Sep-04	31-Aug-05	0 days	250 days	250 days
<b>Rockley to Coconut Court</b>	Tender	15-Nov-06	29-Mar-07	40 days	97 days	57 days
<b>Rockley to Coconut Court</b>	Construction	15-Jun-07	15-Sep-09	160 days	588 days	428 days
<b>Crane Beach</b>	Final Design	01-Jan-03	06-Dec-04	266 days	505 days	249 days
<b>Crane Beach</b>	Pre-qualification	12-Sep-05	02-Jun-06	0 days	190 days	190 days
<b>Holetown Lagoon</b>	Final Design	01-Jan-03	14-Mar-08	241 days	1359 days	1118 days
<b>Holetown Lagoon</b>	TCP Review and Approval	14-Mar-08	30-Jun-09	30 days	338 days	308 days
				<b>Average duration variance: 207 days</b>		

### h) Accuracy and Realism of Cost Estimates

- 3.52 In Table 6 the original Programme budget is compared with the actual cumulative disbursements of the CIP. At US\$30.3 million the total actual cost of the Programme was 25% higher than the original budget of US\$24.2 million. The cost of Administration and Supervision was five times higher than the original budget. Project Administration Unit costs were 153% higher and engineering design and supervision costs were 560% higher than the original budget. Civil works were only 5% higher than originally budgeted, however only three of the original coastal infrastructure projects were completed. It is important to note that these three projects represented 66% of the original budget for civil works.
- 3.53 The original programme budget was based on preliminary designs. The cost of final designs, including physical modelling, was underestimated and did not include the additional studies that were required to obtain complete information about project-related bathymetry and near-shore. Delays in project implementation (due primarily to right-of-way access to construction sites as well as land acquisition) escalated costs due both to inflationary effects as well as the extension of the service contracts of the Design and Supervision Consultants and the PAU.

**Table 6**  
**Comparison of Original Budget with Actual Disbursement**  
**US\$'000**

CATEGORY	ORIGINAL BUDGET				ACTUAL DISBURSEMENTS			
	BANK	LOCAL	TOTAL	%	BANK	LOCAL	TOTAL	%
<b>I. Administration &amp; Supervision</b>	<b>0</b>	<b>2,333</b>	<b>2,333</b>	<b>10%</b>	<b>0</b>	<b>11,593</b>	<b>11,593</b>	<b>38%</b>
1.1 Project Administration Unit		633	633	3%	0	1,598	1,598	5%
1.2 Engineering Design & Supervision		1,500	1500	6%	0	9,906	9,906	33%
1.3 Auditing		200	200	1%	0	89	89	0%
<b>II. Direct Costs</b>	<b>14,000</b>	<b>2,900</b>	<b>16,900</b>	<b>70%</b>	<b>16,160</b>	<b>1,711</b>	<b>17,871</b>	<b>59%</b>
2.1 Civil Works	13,900	2,700	16,600	69%	16,160	1,283	17,443	58%
2.2 Institution Strengthening	100	200	300	1%	0	428	428	1%
<b>III. Unallocated Costs</b>	<b>1,000</b>	<b>1837</b>	<b>2,800</b>	<b>12%</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0%</b>
3.1 Contingencies	1,000	1,000	2,000	8%	0	0	0	0%
3.2 Escalation		837	837	3%	0	0	0	0%
<b>Subtotal</b>	<b>15,000</b>	<b>7,070</b>	<b>22,370</b>	<b>92%</b>	<b>16,160</b>	<b>13,305</b>	<b>29,465</b>	<b>97%</b>
<b>IV. Financial Costs</b>	<b>2,000</b>	<b>130</b>	<b>2,130</b>	<b>9%</b>	<b>657</b>	<b>204</b>	<b>861</b>	<b>3%</b>
4.1 Interest	1830		1830	8%	647	0	647	2%
4.2 Credit Commission		130	130	1%	0	204	204	1%
4.3 Credit Inspection and Supervision	170		170	1%	10	0	10	0%
<b>Total</b>	<b>17,000</b>	<b>7,200</b>	<b>24,200</b>	<b>100</b>	<b>16,817</b>	<b>13,508</b>	<b>30,325</b>	
<b>Percentage</b>	<b>70</b>	<b>30</b>	<b>100</b>		<b>55%</b>	<b>45%</b>	<b>100%</b>	

- 3.54 The original Programme budget for the Hometown Beach Improvement Project was US\$0.7 million and the actual investment cost US\$3.1 million (4.4 times the original budget). The original budget

for the Welches Beach project was US\$2.5 million and actual cost was US\$1.4 million (56% of the original budget). The original budget for the Rockley to Drill Hall project was US\$7.9 million compared to the final cost was US\$9.1 million<sup>3</sup> to construct the project from Rockley to Coconut Court.

**b) Communication Plan**

- 3.55 Successful programme implementation requires a well-defined communication plan that identifies the information and communication needs of stakeholders and other interested parties. The communication plan answers the following questions: what information do stakeholders need? When will they need it? How will it be delivered? What is the cost? Who is responsible for its delivery?
- 3.56 A formal (written) communication plan was not developed for the CIP. However, the Design and Supervision Consultants, together the PAU implemented a highly successful stakeholder communication strategy that was effective at identifying the key concerns of the property owners abutting and abounding the coastal infrastructure projects. The strategy consisted in identifying all of the immediately affected properties and conducting one-on-one meetings with each property owner, prior to public consultation meetings that were held before construction began as well as during construction (a separate set of public meetings was held for each project).
- 3.57 **Recommendation:** for future investment programme, a formally-defined communication strategy should be developed based on and reflecting the results of a thorough stakeholder analysis.

**c) Risk Management Plan**

- 3.58 Sound project design requires the development of a risk management plan that identified the risks (political, budget, organizational, technical, etc) associated with programme execution, the analysis of the effects of the risks and a Risk Management Plan to increase the opportunities and limit the threats to achieving the programme's goals.
- 3.59 During preparation of the CIP, a minor risk was identified, associated with potential conflict of interest from the CZMU, a mainly regulatory and advisory agency, overseeing the construction of coastal infrastructure. This potential conflict did not prove to be an issue during implementation, and was mitigated in two ways: (i) through the contracting of an engineering firm for the design and supervision of the coastal infrastructure project; and (ii) through the contracting of an independent Quality Control Consultant and a Quality Assurance Consultant, as an addition check to ensure that construction and supervision standards were applied.
- 3.60 **Recommendation:** for future investment programmes, a thorough risk management plan should be developed and implemented. The risk management plan should define risk categories for each stage of the project cycle and be linked to the stakeholder communication strategy. The risk identification process should involve all stakeholders in addition to the core project team. As part of the risk management process, qualitative risk analysis should be performed, including the development of a probability and impact matrix. The risk mitigation strategies and planned risk responses should be defined.

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<sup>3</sup> The project costs mentioned here do not factor in the US\$2.2 million cost of armour stone and sand, which are reported as separate line items in the detailed Excel spreadsheet used by the PAU for the financial management of the Programme. The project costs do not include direct supervision costs.



#### d) Performance Indicators

- 3.61 Good project design requires the selection of performance indicators of efficacy, efficiency and quality, which will allow eventual measurement of results, outcomes and impacts. For the performance indicators to be useful, they must be Specific, Measurable, Achievable, Relevant and Time-bound (SMART).
- 3.62 The Logical Framework (April 23, 2007 version) includes three impact indicators related to Programme goals, five outcome indicators related to Programme purpose and 24 results (output) indicators. These indicators were analyzed to verify whether or not they are SMART. The analysis determined that none of the three impact indicators were SMART indicators (Table 7) and only one of the five outcome indicators were SMART (Table 8). All of the output indicators are SMART indicators.
- 3.63 **Recommendation:** for future programmes, it is essential that all performance indicators be specific, measurable, achievable, relevant and time-bound.

**Table 7**  
**Analysis of Impact Indicators**

Indicator	Comment/Analysis
1. Natural ecosystems including coral reefs preserved and enhances as measured by technical indicators to be determined and contained in baseline study to be completed by April 2009, with ex-post follow-up assessment 5 years after project completion.	<p>The baseline study was not undertaken and the technical indicators were not developed.</p> <p>None of the coastal infrastructure projects included in the 2007 logframe had a significant impact on natural ecosystems. Therefore, not a SMART indicator (not Relevant)</p> <p>IDB has no mechanism for ex-post follow-up monitoring, so this indicator would most likely have never been follow-up up on. In this sense, the indicator was not Measurable.</p>
2. Man-made habitats preserved and enhanced as measurement by technical indicators to be determined and contained in baseline study to be completed by April, 2009, with an ex-post follow-up assessment 5 years after project completion	<p>The baseline study was not undertaken and the technical indicators were not developed.</p> <p>None of the coastal infrastructure projects in the 2007 logframe had a significant impact on natural ecosystems. Therefore, not a SMART indicator (not Relevant)</p> <p>IDB has no mechanism for ex-post follow-up monitoring, so this indicator would most likely have never been follow-up up on.</p>
3. Tourist stay-overs are increased by 5% 5 years after project completion	<p>An analysis of historical patterns of tourist stay-overs reveals that the running five-year average growth for the period 1990-2008 is 10%<sup>4</sup>. Thus the indicator was would have implied a negative correlation between coastal infrastructure and tourist stay-overs. Moreover, it is not credible that the CIP projects would alone have had a quantifiable impact on tourist stay-overs. Therefore this is not a SMART indicator because it was not Achievable as a result of the project. Informal interviews with a small number of return visitors provided evidence that even the Boardwalk was not a significant factor in their decision to return to Barbados.</p>

<sup>4</sup> Central Bank of Barbados, Tourist Stay-over Statistics by Length of Stay. Economic and Financial Statistics, May 2010.

**Table 8**  
**Analysis of Outcome Indicators**

Indicator	Comment/Analysis
Safe access to waterfront increased comparing pre- and post- project data after structures are installed	This indicator is not a SMART indicator because it is not Specific.
Person days at project beach locations increase as measured by baseline study in 2007 and follow-up by April 2009	<p>This indicator is not a SMART indicator because it lacks Specificity. Furthermore, the nature of the infrastructure projects was not expected to have a significant impact on person days at beach locations, therefore this is not Relevant. Two of the projects (Rockley to Coconut Court and Holetown Beach) increased access to the coastal</p> <p>Neither the baseline study nor the follow-up study were undertaken.</p>
Water quality improved measured by technical indicators to be determined, with baseline study conducted in 2007 and ex-post conducted by April, 2009	Not a SMART indicator because the projects were not designed to affect the water quality as an outcome.
Beach volume increased by 26,500 cubic meters by April, 2009	A SMART indicator. It is Specific, Measurable, Achievable, Relevant, and Time-bound
Opinion survey about shoreline improvements and benefits among locals conducted in 2007, with follow-up by April, 2009.	Not a SMART indicator because it is not Specific. The opinion surveys mentioned in the logframe were not undertaken.

## 4 PROGRAMME EFFECTIVENESS

- 4.1 This section presents the evaluation findings regarding Programme effectiveness. Programme effectiveness refers to the extent to which the programme produced the expected outputs. In addition, project effectiveness refers to the timeliness and cost-effectiveness of the performance of input delivery, as well as to the cost-effectiveness of the performance of input delivery. The programme's outputs are intended to contribute to the achievement of the programme purpose. In turn, by achieving the programme purpose it is expected to contribute to the achievement of the programme goal.

### a) Planned and Achieved Outputs

- 4.2 The evaluation of the extent to which the CIP has achieved its expected outputs must be considered from two points of view: first, the expected outputs described in the original logical framework model; and second, the expected outputs based on the revised logical framework model of April 2007. The revised logical framework supersedes the original logframe and thus establishes the target outputs against which the success of the CIP must ultimately be measured. It is, however, informative and relevant to analyze the project achievement with regard to the target outputs of the original logframe. This second vantage point provides a perspective of the achieved outputs *vis a vis* the originally targets.
- 4.3 Table 9 presents a comparison of the actual outputs achieved during the implementation of the CIP with the planned outputs as stated in both the 2002 logframe and the 2007 logframe. For each output the percentage of the 2007 goal is shown.
- 4.4 To make it easier to compare the actual outputs with the expected outputs, the relative weight of each output was calculated taking into account the relative weight of the corresponding project. The relative weights were calculated in a three-step process. In Step 1, the relative weight of each project was calculated by dividing the cost of the project by the total infrastructure budget found in Loan Proposal Document (Table 10, Column 1). In Step 2, the total cost of the projects and activities included in the 2007 logframe was divided by the original investment budget. In this way, it was calculated the projects and activities included in the 2007 logframe constituted 85% of the original investment costs (Table 10, Column 2). In Step 3, the original relative weight of each project was divided by 85%, to obtain the revised relative weight based only on the projects and activities that were included in the 2007 logframe (Table 10, Column 3).

**Table 9**  
**Planned and Actual Outputs**

<u>Planned Output</u> 2002 Loan Proposal Document Logframe	<u>Planned Output</u> April 23, 2007 Revised Logframe	Actual Output	% Achieved of 2007 planned output
<b>Rockley – Drill Hall</b>  Loss of sand recharge volume is less than 3% per year at Rockley Beach	<b>Rockley – Coconut Court</b> 1. Five landscaped headlands constructed twelve months after start date 2. 1,200m of boardwalk and revetment and steps constructed 14 months after start date.  3. Beach recharged with 14,000 mt <sup>3</sup> of sand twelve months after start date 4. 38 m Offshore Breakwater constructed	Five landscaped headlands constructed thirteen months after start date 2. 1,200m of boardwalk and revetment and steps completed 18 months after start date. 3. 10,677m <sup>3</sup> of beach recharged 18 months after start date 4. 38 meter Breakwater constructed	100%  100%  76%  100%  <b>TOTAL: 94%</b>
<b>Holetown Beach</b>  Loss of sand recharge volume is less than 3% per year at Holetown Beach.	<b>Holetown Beach</b> 1. New walkway protected by boulder revetment constructed 7 months after start date 2. Two headlands constructed, six months after start date. 3. 2,500 m <sup>3</sup> of beach sand placed 7 months after start date	1. New Walkway protected by boulder revetment constructed 8 months after start date. 2. Two headlands constructed 7 months 3. 2,697.83 m <sup>3</sup> of beach sand placed 8 months after construction	100%  100%  108%  <b>TOTAL: 103%</b>
<b>Welches Beach</b>  Loss of sand recharge volume is less than 3% per year at Welches Beach.	Not included in 2007 logframe. However the project was implemented by CZMU with GOB financing. (i) Construction of a retaining wall with a walkway along the seaward edge and access steps to the beach; (ii) Construction of a revetment along the seaward edge of the roadway and fronting the retaining	(i) Construction of a retaining wall with a walkway along the seaward edge and access steps to the beach; (ii) Construction of a revetment along the seaward edge of the roadway and fronting the	100% 100%  100%

<u>Planned Output</u> 2002 Loan Proposal Document Logframe	<u>Planned Output</u> April 23, 2007 Revised Logframe	Actual Output	% Achieved of 2007 planned output
	wall; construction of three new groynes and refurbishing of the one existing groyne; and (iii) Placement of approximately 12,000 cubic meters of sand recharge.	retaining wall; construction of three new groynes and refurbishing of the one existing groyne; and (iii) Placement of approximately 12,000 cubic meters of sand recharge. This project has created an expanded and stable beach and has resolved the issue of surge and higher wave action that had threatened the physical integrity of Highway 7, which is the principal coastal transportation artery.	<b>TOTAL: 100%</b>
<b>Walkers Savannah</b> 10% yearly increase of sand volume and vegetation cover in Walkers Savannah dunes.	Not included in 2007 logframe	Project not implemented, dunes restored naturally)	
<b>Woman's Bay</b> No rate of beach erosion is detected	NA	NA (Project was not implemented)	
<b>Crane Beach</b> No rate of beach erosion is detected	<ol style="list-style-type: none"> <li>Existing headland and revetment removed four months after start date</li> <li>New revetment &amp; public access in front of remaining cliff constructed, nine months after start date.</li> <li>Submerged breakwater offshore from the new revetment constructed, seven months after start date.</li> <li>Area between public access and breakwater filled with sand nine</li> </ol>	NA (Project was not implemented.)	0%

<u>Planned Output</u> 2002 Loan Proposal Document Logframe	<u>Planned Output</u> April 23, 2007 Revised Logframe	Actual Output	% Achieved of 2007 planned output
	months after start date		
<b>Tent Bay</b>		Project was not implemented.	
<b>Holetown Lagoon</b> Water quality at Holetown Lagoon improves (dissolved oxygen level is maintained above 4 ppm).	NA	NA (Project was not implemented, to form part of subsequent Loan Agreement)	0%
<b>Institutional Development</b>  1. 90% compliance with set-back requirements. 2. Routine near-shore water quality monitoring is performed. 3. Yearly reef monitoring is carried out; 4. Routine Quarterly inspection are performed on coastal structures	<b>Institutional development</b>  1. CZMU equipment and technical support 2. GIS-capable computer, software and peripherals acquired by December 2004 3. Quality control mechanism set up by April 2004 4. Staff trained in GIS short-course by December 2004  5. MEE strategic plan development 6. Technical assistance to MPE for strategic plan for the Ministry	CZMU equipment purchased in June 2003. Technical support in the form of Quality Control consultants acquired in 2004.  Coastal Staff training in GIS and Numerical Modeling was undertaken in April 2003.  GIS capable computer and software acquired in august 2004.  Physical modeling training was undertaken through trips to lab between March and August 2003.  Technical officer received Masters in Coastal Engineering in 2005.  Technical Officer trained on the job in construction	100%  100%  100%  100%  0% 0% 0%

<u>Planned Output</u> 2002 Loan Proposal Document Logframe	<u>Planned Output</u> April 23, 2007 Revised Logframe	Actual Output	% Achieved of 2007 planned output
	7. Ministry's mission reviewed six months after start date.	management of coastal projects 2007 -2009.	0%
	8. Mission revised 8 months after start date		0%
	9. Priority objective established revised 8 months after start date	None of the institutional Strengthening involving the Ministry was implemented as outlined in the Log Frame.	0%
	10. Operational plan developed revised 8 months after start date	Assisted in Phase II of the Environmental Education Strategic Planning Process Provided funding for activities during environment month 2009. Provided funding for Environmental Education Retreat June 2009	

- 4.5 The percentage of output achieved for each project was calculated by comparing the planned output with the actual output (Table 10, below). Each output for a given project was assigned equal weight. Thus, for example, in the case of the Rockley to Coconut Court project, each of its four expected outputs was assigned an equal weight of 25%. The percentage achieved for each output was determined by dividing the actual output by the planned output. For instance, one of the planned outputs for the Rockley to Coconut Court project was that the beach would be recharged with 14,000 mt<sup>3</sup> of sand twelve months after start date. The actual output achieved was 10,677m<sup>3</sup> of beach recharged 18 months after start date. In this case 76% of the output was achieved (10,677 ÷ 14,000). Although the output was achieved 6 months later than the planned date, no points were deducted as temporal effectiveness is addressed below.
- 4.6 The weighted achievement of outputs (Column 5 in Table 10) was calculated by multiplying the 2007 relative weight of the project in Column 3 by the percentage of output achieved in Column 4. The sum of the weight achievement of outputs is the overall percentage achievement of outputs for the CIP.
- 4.7 Using the methodology described above, it was estimated that 75% of the planned outputs of the 2007 logframe were achieved (the sum of Column 5). In terms of the original logframe, 64% of the planned outputs were achieved (the sum of Column 1 × Column 4).

**Table 10**  
**Weighted Achievement of Outputs**

Project/Activity	COL 1 Original Relative Weight of Project	COL 2 Projects included in 2007 Logframe	COL 3 2007 Relative Weight of Project	COL 4 % of Output Achieved	COL 5 Weighted Achievement of Outputs 2007 logframe	COL 6 Weighted Achievement of Outputs Original logframe
Rockley-Coconut Court	47%	47%	55%	94%	52%	44%
Holetown Beach	4%	4%	5%	103%	5%	4%
Welches Beach	15%	15%	18%	100%	18%	15%
Woman's Bay	7%		0%			0%
Crane Beach	11%	11%	13%			0%
Holetown Lagoon	1%	1%	1%			0%
Walker's Savannah	3%		0%			0%
Bay Street	5%		0%			0%
Tent Bay	5%	5%	6%			0%
Institutional Strengthening of CZMU	1%	1%	1%	100%	1%	1%
Institutional Strengthening of MPE	2%	2%	2%	0%	0%	0%
<b>TOTAL</b>	<b>100%</b>	<b>85%</b>	<b>100%</b>		<b>75%</b>	<b>64%</b>

**b) Explanation of Differences between Achieved and Expected Outputs**

- 4.8 Three of the nine coastal infrastructure projects planned for implementation under the CIP were implemented. The following six projects were not implemented: (i) Woman's Bay (silver Sands) – Headland Protection Project; (ii) Bay Street-Demolition and Replacement of Old Hospital Jetty Project; (iii) Tent Bay-Boat Access and Slipway Project; (iv) Walker's Savannah – Dune Restoration Project; (v) Holetown Lagoon Project; and (vi) Crane Beach Project. The reasons why these projects were not implemented are explained below:
- 4.9 **Woman's Bay (Silver Sands)-Headland Protection Project** was removed due to the detection of changed bathymetric conditions that would have required a higher-cost solution than budgeted, and also due to the findings of additional studies which revealed that the project would not benefit the public beach area, but rather only one private landowner. Thus, the astuteness of the Design and Supervision Consultants, together with CMZU support, resulted in the timely identification of issues that concerning the preliminary design and the priority ranking of the project.
- 4.10 **Bay Street-Demolition and Replacement of Old Hospital Jetty Project** was removed at the request of GOB due to a down-grading in priority of the project. The old jetty was subsequently demolished and removed by GOB.
- 4.11 **Tent Bay-Boat Access and Slipway Project:** Two international public competitive bidding processes were undertaken, both of which were declared non-responsive due to the receipt of only one acceptable bid on each occasion. Part of the difficulty in obtaining a large number of competitive bids was thought to be due to the technical complexity of the project design. A proposal was presented to undertake additional work to develop a modified design, however approval for the funds required for this work was not approved.



- 4.12 **Walkers Savannah-Dune Restoration Project** was removed for valid technical reasons; namely the natural environmental recovery of this ecosystem through natural vegetative growth in tandem with effective prohibition of sand mining. The alertness of CZMU and the PAU in monitoring the natural recovery process resulted in a cost savings of US\$0.5 million. Implementing a project that was no longer required would have been highly ineffective, possibly even counterproductive to the desired outcome, as well and cost inefficient. Therefore, its removal from the Programme was not a result of unsatisfactory performance, but rather of the highly satisfactory ability of CZMU to monitor changing environmental parameters and propose changes that were beneficial to Programme effectiveness.
- 4.13 With regard to the **Holetown Lagoon project**, the Design and Supervision Consultants resulted in the identification of an opportunity to increase the effectiveness of the project. Additional hydrologic studies were undertaken and an enhanced design was prepared that included, in addition to the original aerator, a fluidizer system to reduce the frequency of sand accumulation and the retention time of water in the drains and natural water course that terminate at the beaches along the coast of the Holetown Lagoon. The resultant delays in approval of the revised design delayed implementation. Final approval for the application to Town and Country Planning was obtained on June 30, 2009, by which date insufficient time remained to complete the project within the timeframe of the Programme implementation period. Despite this delay, the source cause was not due to an issue with implementation, but rather with the limitations of the preliminary design and external factors related to the approval process which is beyond the control of the Programme Coordination Unit and CZMU.
- 4.14 The **Crane Beach Project** was not implemented due to complications related to the acquisition of land, including a legal impediment, unrelated to the project *per se*, related to one of the parcels of land that was to be acquired for the project.
- 4.15 The two projects comprising Component 3 of the CIP (Improvement of Public Coastal Access) were the Bay Street-Demolition and Replacement of Old Hospital Jetty Project and the Tent Bay-Boat Access and Slipway Project. As has just been stated, these projects were not implemented. Therefore would be reasonable to assume that the outputs related to increased public access were not achieved. This assumption would be incorrect, however, for in reality the CIP achieved a much greater impact in terms of increased public access than the two projects combined were expected to achieve. In the first place, the indicators for these two projects (found in the original logframe) were neither specific nor quantifiable<sup>5</sup>. More to the point the principal infrastructure project of the CIP -- the Rockley to Coconut Court Project -- has had an impact in terms of coastal access improvement that far exceeds the original design parameters of that project and that surpasses the expected impact of the two projects that were removed from Component 3.
- 4.16 By incorporating a wide boardwalk, five aesthetically-designed and well-landscape headlands, as well as revetments that incorporate steps to enhance low-tidal access, this project has surpassed the impact that was expected for the Bay Street Old Hospital Jetty Project and the Tent Bay boat access Project, which were the two projects corresponding to Objective 3 (Table 1). The Boardwalk and its related infrastructure have become a social rendezvous point and a destination in its own right, for locals and tourists alike, for strolling, jogging and scenic viewing. It is estimated that this project alone has resulted in an increase of around 64,000 coastal access hours per year<sup>1</sup> of safe and enjoyable access to the coast.

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<sup>5</sup> The indicators were: (i) Public safety is improved to access the waterfront (Hospital Jetty); and (ii) Number of safe- landings of fisherman-boats increase (Tent Bay)

- 4.17 It should be mentioned that the Welches Beach Improvement Project remained in the Programme, but was removed from Bank financing due to non-compliance by the bidders on the financial profitability index that was applied.
- 4.18 **Recommendation:** For the follow-up to the CIP, the only projects that should be included are the Holetown Lagoon Project and the Tent Bay-Boat Access and Slipway Project. With regard to Tent Bay project, it should be noted that there approximately fifteen small fishing boats currently use the beach and slipway. Based on a discussion with two fisherfolk (one of whom was a boat captain), it does not appear that the volume of fish that is currently fished would increase as the result of an improved slipway, so the economic justification for the project can probably be demonstrated based on increased value of sales. However, the current state of the slipway is precarious and represents a hazard to the physical well-being of the fisherfolk that use the facility.

**c) Extent to which the Outputs that were Achieved Contributed to the Programme Purpose**

- 4.19 The Programme purpose was to improve shoreline preservation and management. All three coastal infrastructure projects that were completed during the CIP contributed directly to the achievement of this purpose. Table 11 presents the achieved outcomes corresponding to each of the purpose-outcome indicators from the 2007 logframe.

**Table 11**  
**Project Purpose-Outcome Indicators and Results Achieved**

Purpose-Outcome Indicator	Outcome Achieved / Comments
<b>Indicator 1:</b> Safe access to waterfront increased, comparing pre- and post-project data after structures are installed.	Safe access increased by 4.5 km of continuous safe beach access
<b>Indicator 2:</b> Person days at project beach locations increased as measured by technical indicators to be determined, with baseline study conducted in 2007, and follow-up by April 2009	An estimated increase of 64,000 person-hours per year of safe and enjoyable access to the coast.  Note: None of the three coastal infrastructure projects implemented during the CIP were designed or expected to increase person days at project beach locations. The baseline study was not available during the evaluation and the follow-up baseline study was not undertaken by the PAU.
<b>Indicator 3:</b> Water quality improved measured by technical indicators to be determined, with baseline study conducted in 2007 and ex-post conducted by December, 2009.	The three coastal infrastructure projects that were implemented did not have and were not expected to have an impact on improving water quality. Of the 9 projects included in the original Programme design, only the Holetown Lagoon project was designed to result in an improvement in water quality. This project had a planned cost of US\$200,000 and represented only 1.2% of the planned coastal infrastructure works. Since the Holetown Lagoon project was not undertaken, the baseline and ex-post studies referred to were not undertaken
<b>Indicator 4:</b> <b>Beach volume increased by 26,400 cubic meters by Dec. 2009</b> Note: this indicator refers to the combined goal for Rockley to Coconut Court, Holetown Beach and	Beach volume increased by _____, including 10,677m <sup>3</sup> on the Rockley to Coconut Court project, 2,697.83 m <sup>3</sup> at Holetown Beach.  Note: Although the Welches Beach project was not

Crane Beach.	included in the 2007 logframe it was nevertheless financed under the CIP with GOB funds. Beach volume was increased by 2,000 m <sup>3</sup> at Welches Beach.
<b>Indicator 5:</b> Opinion survey about shoreline improvements and benefits among locals and tourist conducted in 2007, with follow-up by December 2009.	According to a stakeholder survey undertaken as part of the final evaluation, 100% of respondents agree or strongly agree that the projects are beneficial to Barbados. 50% of business respondents indicated that monthly revenue has increased by 1% to 5% as a direct consequence of the projects.  Note: the opinion survey referred to in the logical framework was not undertaken by the CPU.

- 4.20 The logical framework model did not include an indicator of the increase length of shoreline and coastal infrastructure protected from erosion; it should have, for this was one of the main achievements of the three coastal infrastructure projects of the CIP: the length of protected shoreline was increased by 2 kilometres.
- 4.21 It should be pointed out that only one of the purpose-outcome indicators is specific (Indicator 4). The problem with non-specific indicators is that they are vague insofar as they do not indicate the specific amount by which the project is expected to impact or improve the existing or baseline condition.
- 4.22 Two of the purpose-outcome indicators are not relevant to the CIP. Indicator 2 is not relevant because none of the projects were designed to increase person days on beaches. Similarly, Indicator 3 is not relevant because, aside from the small (as it was originally conceived) Holetown Lagoon Aeration System Project -- which in any event was not included in the 2007 logframe -- none of the projects were designed to improve water quality.

**d) Extent to which the Achievements Related to Programme Purpose Contributed to the Programme Goal**

- 4.23 As defined in the 1997 logframe, the goal of the Programme was that a “healthy environment that will contribute to the sustained economic development of the Country”. The Programme purpose was “improved shoreline preservation and management”. Each of the three coastal infrastructure projects completed under the CIP had a positive and measurable impact on improving shoreline preservation. In total, the projects resulted in providing 1.7 km of protected shoreline.
- 4.24 Curiously, however, length of protected shoreline was not included as one of the performance indicators related to Programme goal in the Programme’s logframe. The three performance indicators included were:
1. Natural ecosystems including coral reefs preserved and enhanced as measured by technical indicators to be determined and contained in baseline study to be completed by April, 2009, with ex-post follow-up assessment 5 years after project completion.
  2. Man-made habitats preserved and enhanced as measured by technical indicators to be determined and contained in baseline study to be completed by April 2009, with an ex-post follow-up assessment 5 years after project completion.
  3. Tourist stay-overs are increased by 5% 5 years after project completion.

- 4.25 In order to evaluate the extent to which the achievements related to Programme purpose contributed to the Programme goal, it is useful to examine the extent to which each of the outcomes indicators included in the logframe contributed to achieving the performance indicators related to the Programme goal. Table 11 shows the correlation between the Purpose-outcome indicators and the goal-impact indicators. In the table, a ✓ indicates that a correlation exists. For instance, Purpose-Outcome Indicator 1 is correlated to Goal-Impact Indicator 3. An ✕ indicates one of two things: either there is a lack of correlation or else the programme failed to impact on the related indicator. An example of the first instance (lack of correlation) is found in Purpose-Outcome Indicator 1 (safe access), which is not directly correlated to either Goal-Impact Indicator 1 (natural ecosystem) or Goal-Impact Indicator 2 (man-made ecosystem). An example of the second instance (programme failed to impact) is found in Purpose-Outcome Indicator 3 (water quality improvement), which, although related conceptually to the natural ecosystem indicator, the CIP did not impact on water quality since the one project that would have impacted water quality (the Hometown Lagoon project) was not implemented.
- 4.26 Purpose-Outcome Indicator 1 (safe access) contributes theoretically but not empirically to the Goal-Impact Indicator 3. In reality, the increased safe access to waterfront may increase the enjoyment of tourists (and locals), but it does not have a measurable impact on the number or length or tourist stay-overs.
- 4.27 Purpose-Outcome Indicator 2 (person days at beach locations) does have a logical correlation to tourist stay-overs, but the fact is that none of the three projects that were implemented during the CIP have had or were expected to have had a positive impact on the number of person days at project beach locations.
- 4.28 Purpose-Outcome Indicator 3 has a logical connection to Goal-Impact Indicator 1 and 2; however none of the three coastal infrastructure projects implemented under the CIP had or were expected to have a positive impact on water quality.
- 4.29 Purpose-Outcome Indicator 4 (beach volume) has an empirically measurable correlation between Goal-Impact Indicator 1 (natural ecosystem) and theoretically but not measurable correlation on Goal-Impact Indicator 3 (Tourist stay-overs).
- 4.30 Purpose-Outcome Indicator 5 has no impact on the Goal-Impact Indicators because it is, in fact, not an indicator. The opinion survey, rather, is the means of verification of an indicator that is not actually defined in the 2007 logframe.

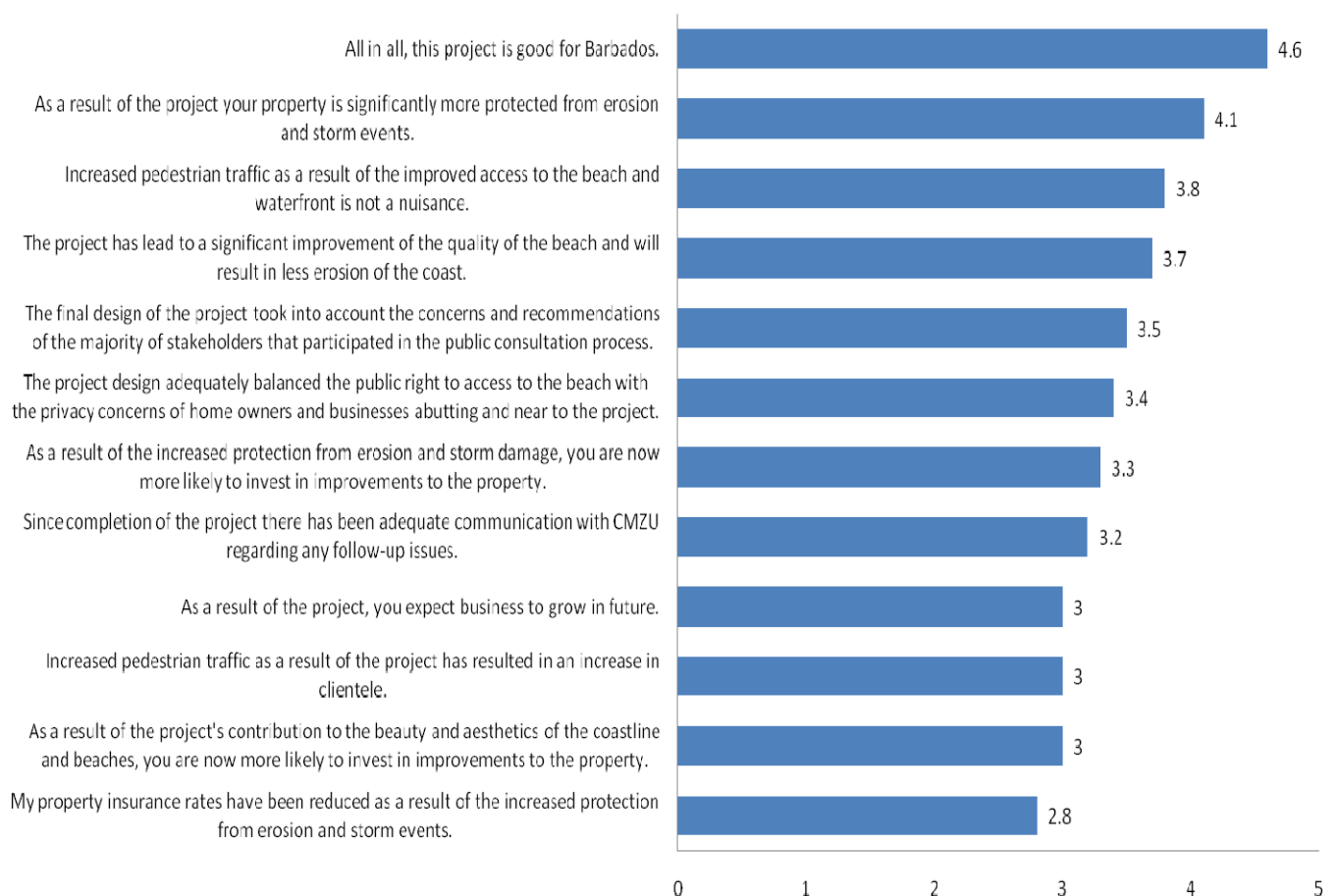
**Table 11**  
**Correlation between Purpose-Outcome Indicators and Goal-Impact Indicators**

Purpose-Outcome Indicator	Goal-Impact Indicators		
	1 Natural Ecosystem	2 Man-Made Ecosystem	3 Tourist Stayovers
1. Safe access to waterfront increased comparing pre-and post-project data after structure are installed.	✕	✕	✓
2. Person days at project beach locations increased as measured by baselines study in 2007 and follow-up by April, 2009	✕	✕	✕
3. Water quality improved measured by technical indicators to be determined, with baseline study conducted in 2007, and ex-post conducted by April, 2008	✕	✕	✕

4. Beach volume increase by 26,500 cubic meters by April, 2009	✓	✗	✓
5. Opinion survey about shoreline improvements and benefits among locals and tourists conducted in 2007, with follow-up by April, 2009	✗	✗	✗

- 4.31 In summary, the ability to assess the extent to which the achievements related to Programme purpose contributed to the Programme goal is limited by the fact that two of the purpose-outcome indicators (Indicator 2 and 3) were not logically related to the goal-impact indicators, while a third so-called indicator (indicator 5) was not actually an indicator but rather a means of verification.
- 4.32 Safe access was increased by 1.7 km and beach volume. The purpose-outcome indicator was not specific, however, (i.e. a precisely defined, empirical, measurable goal) and so it is not possible to say whether the programme succeeded in achieving its goal at the purpose-outcome level.
- 4.33 Beach volume was increased by 15,375 m<sup>3</sup>, which is 58% of the outcome goal of 26,500m<sup>3</sup>. Of the five purpose-outcome indicators, this was the only SMART indicator (Specific, Measurable, Achievable, Relevant and Time-bound).

**Figure 5**  
**Stakeholder Perceptions of Project Completion**



### e) Timeliness of Input Delivery

4.34 To evaluate the timeliness of input delivery, the planned and actual duration of activities were compared. The planned durations were taken from detailed from the schedule of activities included as Appendix A of the First Progress Report of the Coastal Infrastructure Programme<sup>6</sup>. The actual duration times were provided by the CPU during the final evaluation consultancy. Table 12 presents the data and the variation between the planned and actual duration. For the three coastal infrastructure projects that were implemented during the CIP (Holetown Beach, Welches Beach, Rockley to Coconut Court), the duration times are shown for the following activities: final design, Town and Country Planning (TCP) review and approval, IDB no-objection, pre-qualification and tendering, and construction. Time variation is also shown for two of the projects that were not implemented but for which final designs were prepared (Crane Beach and Holetown Lagoon).

4.35 The average time variation between planned and actual duration of key activities was 207 days.

**Table 12**  
**Planned and Actual Duration and Duration Variance**

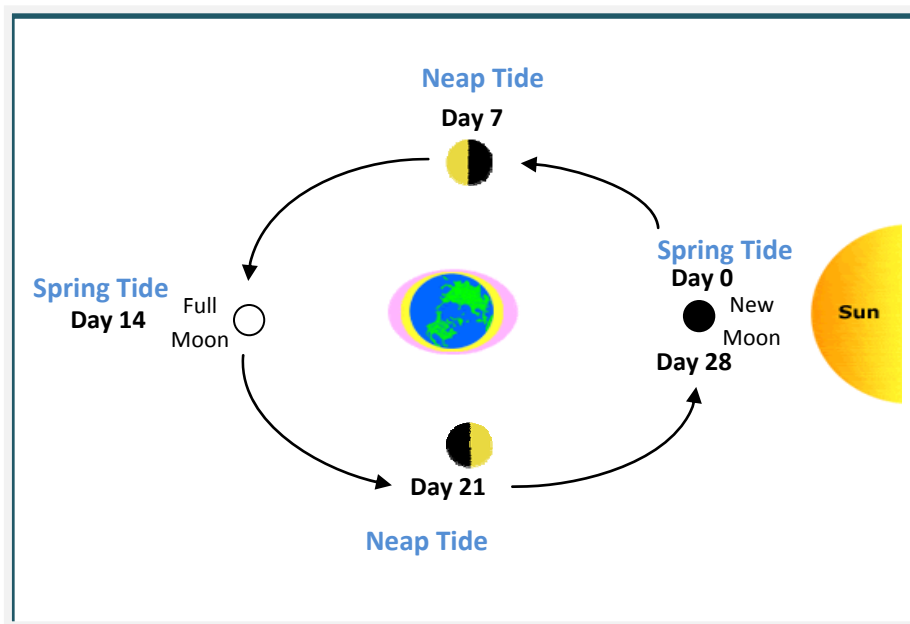
Project	Activity	Actual Finish Date	Actual Finish Date	Actual Duration (Days)	Planned Duration (Days)	Duration Variance (Days)
1. Holetown Beach	Final Design	01-Jan-03	15-Jul-03	140	129	11
2. Holetown Beach	TCP Review & Approval	12-Sep-03	07-Jun-04	192	23	169
3. Holetown Beach	Prequalification	15-Oct-04	30-Sep-05	251	0	251
4. Holetown Beach	Tender	12-Mar-08	17-Sep-08	136	22	114
5. Holetown Beach	Construction	02-Mar-09	20-Oct-09	167	100	67
6. Welches Beach	Final Design	02-Jan-03	30-Aug-03	173	124	49
7. Welches Beach	TCP Review & Approval	10-Dec-03	15-Jun-04	135	30	105
8. Welches Beach	IDB No-objection	19-Jul-04	26-Aug-04	29	0	29
9. Welches Beach	Pre-qualification and tender	15-Oct-04	16-Jul-05	196	20	176
10. Welches Beach	Construction	20-Jul-05	15-Jul-06	258	114	144
11. Rockley to Coconut Court	Final Design	21-Jul-03	21-Jul-05	525	173	353
12. Rockley to Coconut Court	TCP Review and Approval	28-Sep-04	28-Feb-05	110	90	20
13. Rockley to Coconut Court	IDB No-objection	11-May-05	21-Jul-05	52	0	52
14. Rockley to Coconut Court	Prequalification	16-Sep-04	31-Aug-05	250	0	250
15. Rockley to Coconut Court	Tender	15-Nov-06	29-Mar-07	97	40	57
16. Rockley to Coconut Court	Construction	15-Jun-07	15-Sep-09	588	160	428
17. Crane Beach	Final Design	01-Jan-03	06-Dec-04	505	266	249
18. Crane Beach	Pre-qualification	12-Sep-05	02-Jun-06	190	0	190
19. Holetown Lagoon	Final Design	01-Jan-03	14-Mar-08	1359	241	1118
20. Holetown Lagoon	TCP Review and Approval	14-Mar-08	30-Jun-09	338	30	308
Average time variance (Days)						207

<sup>6</sup> W.F. BAIRD & ASSOCIATES COASTAL ENGINEERS LTD, "Coastal Infrastructure Programme – Government of Barbados First Progress Report". June 16, 2003.

#### f) The Set-Back Policy and the High Water Mark

- 4.36 An issue that impacted negatively upon the effectiveness of CIP was the ability of CZMU to implement the set-back policy as described in the Integrated Coastal Management Plan (ICMP) for the West and South Coasts according to which “the setback line is EITHER 30 metres from the mean HWM or to the line of inundation predicted to occur during a 100 year storm event”.
- 4.37 According to the Coastal Zone Management Act (CZMA), “High water mark” means the line of the highest run up of waves at the mean tide between spring and neap tides, determined as specified in Section 32”. According to Section 32 of the CZMA any observations or measurements to determine the high water mark shall be made at the time of any ordinary high tide occurring on the sixth, seventh or eighth days before or after the day of a full moon”.
- 4.38 As illustrated in Figure 6, the sixth, seventh or eighth day before or after a full moon is when a neap tide occurs. A neap tide is the lowest tide occurs in the monthly lunar cycle. Section 32 of the CZMA therefore indicates that tides must be measured at low tide, rather than the mean tide between spring and neap tides. Therefore, Section 32 provides an erroneous definition of when to calculate the average or mean tide. In point of fact, a more accurate measurement of the mean tide can be obtained on the 3<sup>rd</sup> or 4<sup>th</sup> day before or after full moon, as evidenced by the example provided in Table 13 which shows the Spring Tide and Neap Tides at Bridgetown before, on and following New Moon of June 1, 2007, an example selected at random to demonstrate this point.
- 4.39 According to the specification of Section 32, the HWM is by law measured at the neap tide rather than at mean tide, resulting in a larger area of private property, thereby reducing public access. The incorrect definition of error impacted the Rockley to Coconut Court project. When one of the property owners abutting and abounding the project took a new measurement of the so-called mean tide, according to Section 32, the resulting mark proved more seaward than the mark that CZMU had used for the project design. As a result, CZMU was obliged to shift the boardwalk several meters seaward, at a cost of around US\$200,000 and resulting in a loss of around 340 m<sup>2</sup> of beach area.

**Figure 6**  
**Spring Tides and Neap Tides during the Lunar Cycle**





**Table 13**  
**Spring Tide and Neap Tides at Bridgetown**  
**Before, On and Following New Moon of June 1, 2007**

	DATE	HIGH TIDE HEIGHT <sup>1</sup>
<b>Neap Tide</b>	Day -8	<b>0.9</b>
	Day -7	1.0
	Day -6	1.2
	Day -5	1.3
	-4	1.4
	-3	1.4
	-2	1.4
	-1	1.4
<b>FULL MOON (Spring Tide)</b>	June 1, 2007	1.6
	1	1.6
	2	1.6
	3	1.4
	4	1.3
	5	1.2
<b>Neap Tide</b>	Day 6	<b>0.8</b>
	Day 7	1.0
	Day 8	1.3

Arithmetic Average of Spring Tide Height + Neap Tide Height before Full Moon) :  
 $(1.6 + 0.8) \div 2 = \mathbf{1.2 \text{ feet}}$

Arithmetic Average of Spring Tide Height + Neap Tide Height (after Full Moon):  
 $(1.6 + 0.9) \div 2 = 1.25 \approx \mathbf{1.3 \text{ feet}}$

1.1 An astute land owner would have measured the HWM on all 6 days specified in Section 32 of the CZMA, and then submitted a HWM measurement of 0.8 feet, resulting in a windfall land gain relative to the true

- 4.40 A second point that merits mention with regard to the set-back policy is that, according to the Integrated Coastal Management Plans<sup>7</sup>, the setback policy is being applied “retroactively”. Since most developed existed before the setback policy was established, the retroactive application of the policy would imply moving buildings to comply with the 30 meter rule. This is not happening .
- 4.41 **Recommendations:** The definition of average mean tide contained in Section 32 of the Coastal Zone Management Act should be corrected to ensure that private property reflect the water line that occurs at the high tide between at the spring tide and the neap tide. The definition should be changed to read:
- 4.42 “The measurement of the high water mark shall be made at the time of any ordinary high tide occurring on the third or fourth day before or after the day of a full moon”.
- 4.43 Currently, HWM measurements are valid for a period of two years. Taking into account the fact that the time required for preliminary project design, final project design, approval, procurement and construction may exceed two years, consideration should be given to extending the period of the HWM to five years.
- 4.44 The clause of the Integrated Coastal Management Plans regarding setback policy is being “retroactively” should be corrected to reflect actual policy.

<sup>7</sup> Integrated Coastal Management Plan for the West and South Coast, p. 7



## 5 EFFICIENCY

### a) Adequacy of the Organizational Structure

- 5.1 The efficiency of the organizational structure of the CIP was evaluated from the following perspectives: whether the organizational structure was appropriate for the scope of work; and whether there was adequate definition of profiles, roles, responsibilities and lines of reporting.
- 5.2 The CIP was implemented by a Project Administration Unit within the CZMU. The Project Administration Unit consisted of a Project Coordinator (Coastal Engineer), an Engineer and a Clerical Officer. The Project Coordinator, who reported to the Director of CZMU, was the second-ranked professional within the CZMU, on par with the CZMU Deputy Director. As such, in addition to his responsibilities related to the CIP, the Project Coordinator had responsibilities related to the day to day management of the CZMU. When the CZMU Director and Deputy Director were absent from the office, the Project Coordinator served as Acting Director. Some days the Coordinator's duties related to CZMU would require a full day's attention.
- 5.3 CZMU has two coastal engineers. During a significant portion of the CIP, however, the Project Coordinator was the only coastal engineer in the CZMU due to the fact that the CZMU's only other coastal engineer was abroad receiving his Masters degree in Coastal Engineering – one of the institutional strengthening activities financed under the CIP. When CMZU needed to undertake site visits or provide coastal engineering services, the responsibility fell to the Project Coordinator with his role as CZMU Coastal Engineer. The dual roles of CIP Coordinator and CZMU Senior Coastal Engineer created a time constraint that affected the Coordinator's ability to efficiently manage the CIP.
- 5.4 During the implementation of the CIP, it became clear that the PAU had adequate capacity to implement one coastal infrastructure project at a time. The original Programme implementation plan, however, would have required the simultaneous implementation of several projects. Had this original implementation plan been adhered to, the structure of the PAU would not have been adequate. The resource planning that took place during the Programme's preparation and design had not identified this constraint. The limiting factor is the need to have a CPU coastal engineer on-site for each project to provide project oversight, to complement the supervisory services provide by the consultant engineers that were contracted to complete the final designs and supervise construction of the coastal engineering projects.
- 5.5 The PAU did not have its own financial administrator. Rather, the CZMU Accountant, responsible for the CZMU as a whole, provided accounting services to the CIP. At the time that the Programme was being designed, this arrangement was satisfactory, because the CZMU Accountant at that time had considerable experience in the financial administration of IDB projects, having been responsible for the financial administration of the Coastal Conservation Pre-Investment Programme from 1991 to 1995.

- 5.6 Two years into the implementation of the CIP, however, the CZMU Accountant retired. CZMU then went through two other accountants, both of whom had limited project accounting experience and both of whom only remained at CZMU for a short time. CZMU then hired its current accountant, who also lacks experience in project financial administration. When the current CZMU Accountant was hired, the PAU Coordinator decided that – having gone through a succession of accountants with limited project financing experience – it would be more efficient for him to assume responsibility for the Programme’s financial administration. Thus, the PAU Coordinator assumed responsibility for managing the Programme accounts and preparing disbursement requests and financial reports. This further exacerbated the time constraint issues caused by the Coordinator’s shared duties between CIP and CZMU.
- 5.7 The PAU Coordinator kept track of Programme finances in Excel spreadsheets and on a cash basis. The Excel spreadsheets provide a good level of detailed information on disbursements, down to the project level and below, including disbursements for specific tasks. The spreadsheets provided a detailed breakdown of the Engineering Design and Supervision costs as well as detailed breakdown of the investment costs for each of the three infrastructure projects that were financed.
- 5.8 The Programme financial spreadsheets provided the basis for the preparation of the Programme’s financial statements that were prepared by an external Chartered Accountants hired by PZMU. These financial statements provide aggregate information at the level of Component and Sub-Component. The financial statements do not provide detailed of programme expenditures at the project or activity level.
- 5.9 The financial administration of the CIP accounts was complicated by the fact that different exchange rates were use. The CIP auditors use a conversion rate of 2:1 Bds\$:US\$, the IDB uses 1.9975 as did the PAU. However the Design and Supervision Consultants (Baird) were paid 70% in their US dollar account and 30% to their Barbados account. The government accounting system uses two different rates for that conversion: 2.035 for the US account and 1.9975 for the Barbados account. This situation created difference between the financial statements prepared by the external Chartered Accountants on the one hand and the financial spreadsheets prepared by the PAU Coordinator in his role as PAU financial administrator. Moreover, the audited financial statements and the spreadsheet data do not reconcile with the Programme disbursement records of the IDB.

#### Conclusions and Recommendations

- 5.10 It is desirable to have a Programme Coordinator who is exclusively responsible for management of the programme.
- 5.11 It is desirable for the programme to have a Deputy Coordinator (either an engineer or project manager) who would have the knowledge base and capacity to substitute for the Coordinator in the case of his or her absence, who would know all the working of project, executes disbursement requests. The Deputy Coordinator would be able to substitute for the Coordinator.
- 5.12 To ensure adequate financial administration of the project, it is necessary to have a financial administrator that is knowledgeable of financial management of projects and familiar with the financial procedures of the IDB and adept at financial projections and accrual-based accounting and skilled in the use of a commercial financial software packages. Adequate financial administration is best ensured by having a dedicated Financial Administrator.

Institutional Hierarchy and Confidence of Authorities

- 5.13 The fact that the PAU was situated within the CZMU, together with the fact that the PAU was lead by the second-highest ranked professional of CZMU, helped to ensure that the PAU enjoyed sufficient institutional hierarchy and confidence of authorities with regard to the technical issues of coastal infrastructure. External stakeholders did not perceive the PAU to be distinct from CZMU.
- 5.14 Confidence, however, did not translate into timely decision-making with regard to the approval of final designs. Notwithstanding the presence on the CIP Board of a Senior Town Planner who reviewed and provided no-objection to the final designs, the review and approval process for final design took 194 working days, on average<sup>8</sup>.
- 5.15 Similarly, the high level of confidence of authorities in CZMU did not translate into the quick resolution of property acquisition issues. In this regard, it is important to clarify that CZMU only provides recommendations to Town and Country Planning regarding coastal zone development; it does not issue permits for coastal related development, which is the responsibility of the Minister of Planning who makes decision taking into account CZMU recommendations. The Minister of Planning is not, however, required abide by CZMU recommendations.

**b) Ability of the CZMU to adequately administer all Aspects of the Programme**

- 5.16 Adequate programme administration entails scope management, time management, cost management, communication management, financial management, procurement management, risk management monitoring, supervision and quality control, and project completion.

Supervision and Quality Control

- 5.17 As witnessed by the extremely high quality of the three coastal infrastructures constructed during the CIP, CZMU demonstrated a very strong ability to supervise projects and ensure quality control. CZMU was supported in the supervision and quality control by the Design and Supervision Consultants. The Design and Supervision Consultants employed state-of-the-art procedures (mathematical and physical modelling) to design testing and finalization and insisted on the use high calibre materials and precise construction techniques and displayed a highly professional work ethic throughout their consultancy evidenced by, amongst other things, the attention to detail in the selection and use of armour stone, and in their personalized, one-on-one dealings with property owner stakeholders.
- 5.18 As a result of the working relationship between the Design and Supervision Consultant and CZMU, CZMU considers that its own technical capacity has been significantly strengthened, in terms of supervisory and quality control as well as in regard to procurement (preparation of bidding documents and review of proposals).

Time management

- 5.19 Good time management requires the thorough and detailed identification of the activities and tasks required to complete the Programme as well as an accurate and realistic planning of time required for each task and activity. Time estimation should be done using Programme Evaluation and Review Technique (PERT). Once realistic time lines have been developed for all activities (as

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<sup>8</sup> Based on TCP review and approval process for Holetown Beach, Welches Beach, Rockley to Coconut Court, and Holetown Lagoon. Holetown Lagoon was approved but not implemented under the CIP.

part of the programme planning process), the task of the PAU during programme implementation is to ensure, to the extent that they are able, that tasks and activities are carried out with the established times.

- 5.20 As shown in Table 5 (p. 22), the average time variance, defined as the difference between planned time and actual time, for key Programme activities was 207 days. An analysis of the root causes revealed that there was a problem with the degree of accuracy of the time planning rather than with the lack of capacity of the PAU to administer the implementation of activities. Having said that, strengthened time planning skills would have enabled PAU to plan the project timelines and critical paths in a more realistically.

#### Cost management

- 5.21 Good cost management consists of ensuring good value for money and completing the programme on budget. Completion of programme on budget, however, requires that the programme budget has been estimated accurately. In the case of the CIP programme costs were significantly underestimated during the preparation phase, which was completed before the creation of the PAU. The programme budget did not accurately estimate the cost of engineering design and supervision. Engineering Design and Supervision were originally budgeted at US\$1.5 million. The final cost of Engineering Design and Supervision US\$9.9 million, 660% higher than the original budget. Fixed fees for the design phase alone were US\$2.4 million (Table 15).

**Table 15**  
**Detail of Engineering Design and Supervision Costs (2003 – 2010)**

<b>TOTAL</b>	<b>\$9,905,783.00</b>
<b>1. Fixed Fees (Design Phase)</b>	<b>\$2,423,740.26</b>
<b>2. Additional Design Fees</b>	<b>\$1,261,265.88</b>
<b>3. Physical Modelling</b>	<b>\$851,723.00</b>
<b>4. Reimbursable Fees (Design Phase)</b>	<b>\$294,644.38</b>
<b>5. Fixed Expenses (Construction Phase)</b>	<b>\$967,214.16</b>
<b>6. Reimbursables (Construction Phase)</b>	<b>\$34,523.05</b>
<b>7. Professional Services (Construction Observation)</b>	<b>\$2,399,071.91</b>
7.1 - Construction Observation Delay	\$428,770.60
7.2 - Welches Beach Improvement Programme	\$148,053.00
7.3 - Rockley Waterfront Improvement Programme	\$978,611.72
7.4 - Hometown Beach Improvement Programme	\$614,856.00
7.5 - Sand Processing	\$101,031.72
7.6 - Armour Stone Processing	\$127,748.87
<b>1.2.8 Extra Fees for Contract Extension (August 31 2005 - August 31, 2008)</b>	<b>\$812,317.95</b>
<b>1.2.9 Additional Studies</b>	<b>\$861,282.41</b>

- 5.22 In part, this difference was due to additional services that weren't contemplated or properly costs, such as physical modelling (\$851,723), undertaking additional studies not related to the original nine infrastructure projects (861,282). One additional study was the "Armour Stone Sourcing Report", which was completed at a cost of US\$42,500. CZMU considers that "the significant benefits to the Government of Barbados having this information cannot be understated. This information is vital for future projects as it relates to future capital expenditure and maintenance costs due to material quality and sources identified in the report".

- 5.23 In part, this difference was due to cost inefficiencies related to the extended implementation time of the Programme. Extra fees for contract extension of the design and supervision firm beyond the original completion date of 2007 totalled US\$2.4 million according to PAU unaudited financial spreadsheets. In addition, a construction observation delay penalty of US\$428,770 was incurred as a result of the implementation delay.
- 5.24 According to the original budget, engineering design and supervision costs were estimated to be 9% of the direct cost for civil works. In actual fact, design and supervision costs were 57% of investment costs of projects (\$9,905,783.00 ÷ \$17,442,892).
- 5.25 The cost services of the design and supervision engineering consultants explains most of the difference between the original budget and final programme costs. CZMU considers that these consultants brought the highest level of professional quality to their work and that the consultants succeeded in “raising the bar” on coastal zone infrastructure works, both in terms of procurement and detailed and highly demanding technical requirements, as well in the thoroughness and uncompromising quality of their work.
- 5.26 The independent quality control and assurance consultants that were hired by CZMU to provide an independent assessment of the design and engineer consultants did not identify any issues related to the quality of the work. These consultants were not required in their terms of reference to review and comment upon the cost effectiveness of the work.
- 5.27 It is important to note that all of the costs related to engineering design and supervision were financed with GOB financing. Thus, the disbursements for the design and supervision consultants were not subject to ex-ante no-objection by IDB.
- 5.28 In future projects, it is recommended that the review of financial cost be included in the terms of reference of the independent quality control and assurance consultants hired to maintain an objective eye on design and supervision consultants.
- 5.29 Other cost inefficiencies related to the extended implementation period were related to the incremental cost of the PAU for the addition programme years (2008-2010) was US\$1.0 million, while the cost of auditing programme accounts for the addition programme years totalled US\$89,154.

#### Procurement Management

- 5.30 Despite the lack of a dedicated Procurement Specialist, the PAU succeeded in carrying out the procurement exercises without error or delay originating from within the PAU. One aspect that may have contributed to the PAU’s ability was CZMU’s experience with the two projects that were precursors to the CIP. In addition, PAU was in communication with the project coordination units of other IDB projects, creating a network of peers that provided a pool of shared knowledge.
- 5.31 Both in terms of financial cost and time, the most significant procurement activities under the CIP consisted of the purchase of goods and services for the three coastal infrastructure projects. Procurement for these projects was complicated by delays related to the acquisition of private property and obtaining right-of-way access to construction sites. Procurement delays were also caused by non-responsive bids, which necessitated the repetition of the bidding process.
- 5.32 Another factor that complication procurement management was that, according to the IDB procurement procedures that were in place at the outset of the CIP, it was necessary to pre-qualify construction firms for all works projects, prior to undertaking the tendering process. Problems related to the pre-qualification process arose when delays in project preparation due to

right-of-way access, land acquisition and approval processes caused the twelve month prequalification status to expire, which then necessitated the repetition of the pre-qualification process. Put another way, problems arose when the pre-qualification exercise was carried out before all aspects of project preparation --including right-of-way access, final approval, and land acquisition -- was completed. The PAU initiated the pre-qualification process with a view to expedite the procurement process and based on the expectation that the project preparation activities would be completed within the twelve month time period. In hindsight, though, it is preferable to postpone pre-qualification until the land acquisition and right-of-access issues have been resolved.

- 5.33 Other procurements under the CIP included the Engineering Design and Supervision Consultants, the Quality Assurance and Quality Control consultants; auditing services; and equipping and technical support for the CZMU. The procurement of these goods and services went smoothly.
- 5.34 With regard to the procurement activities related to the coastal infrastructure projects that were implemented under the CIP, Table 5 indicates that the procurement process (including prequalification and tender) for the Holetown, Welches and Rockley projects took a total of 387 days, 196 days and 347 days, respectively.
- 5.35 The procurement issues related to the pre-qualification process would no longer affect future projects of the size of civil works carried out under the CIP, as IDB procurement rules were modified in 2006 to allow civil works valued under US\$ 10 million to be tendered without prequalification.
- 5.36 Such procurement delays as did occur during the CIP were a result of factors external to the PAU, such as non-responsive or ineligible bids, lengthy approval processes, and land acquisition processes that caused the twelve month validity period for pre-qualified companies to expire. For instance, in the case of the Tent Bay project (which was ultimately not implemented under the CIP), two procurement exercises failed to produce an acceptable bid, in the first place because only one firm bid and in the second place because the bidding price was significantly higher than the PAU's cost estimate. In the case of the Welches Beach project, neither of the two contractors satisfied all of the financial criteria required by IDB procurement guidelines and therefore did not meet with IDB no-objection. In that particular case, GOB chose to finance the project without IDB financing and the project was successfully completed. In the case of the Holetown Beach project, an unexpectedly long process to obtain right-of-access to the construction site complicated the procurement process by rendering invalid the one-year time validity of pre-qualified construction firms.
- 5.37 On the Rockley to Coconut Beach project, time delays of more than twelve months related to land acquisition caused the expiration of the eligibility status of firms that had been prequalified. With hindsight it would, perhaps, have been possible to avoid the expense and time involved in undertaking the pre-qualification process. The pre-qualification process was initiated even though land required for completion of the project had not yet been acquired. Taking into account the fact that pre-qualification status of firms retains validity for a period of one year, it might have been anticipated that this time period would run out before the land acquisition process could be completed, thus necessitating the repetition of the pre-qualification process. More thorough planning and a more realistic estimate of time requirements and the elaboration of a critical path might have identified the need to complete the land acquisition process prior to initiating the pre-qualification process. As it transpired, in the case of the Rockley to Drill Hall project, the difficulty in acquiring land resulted in a design change and the shortening of the project to extend from Rockley to Coconut Beach.

- 5.38 One procurement issue that merits some discussion relates to the purchase of sand and armour stone that were key materials used in all three infrastructure projects. The procurement procedures used by CZMU to purchase sand and armour stone did not satisfy IDB requirements and did not meet with IDB no-objection. Based on a technical recommendation by the Design and Supervision engineer consultants, and, the PAU purchased a bulk quantity of granite armour stone from a Canadian quarry for \$1,188,048 (around US\$60/ton).
- 5.39 The Design and Supervision consultants recommended the bulk purchase of granite armour stone from the for four reasons: (i) higher density; (ii) lower maintenance costs; (iii) longer duration compared to locally-available armour stone; and (iv) bulk purchase would allow for the construction process to be implemented without interruption. After carrying out site visits to potential suppliers to inspect that quality and availability of their armour stone, the Design and Supervision consultants ultimately recommended purchase from a Canadian quarry that satisfied quality and availability criteria.
- 5.40 The PAU prepared a document justifying the purchase for \$1,188,048, but did not succeed in obtaining IDB no-objection. The arguments and evidence provided in the document appear convincing, however some additional detail may concern local pricing and comparing cost-effectiveness may have been required to provide adequate support for the purchase of the armour stone from the Canadian quarry. It is noted that the PAU did not have a Procurement Specialist and as such would have likely benefited from some procurement support and guidelines on this particular matter from the IDB procurement specialist.
- 5.41 A similar case arose with the purchase of sand for \$1,022,798 from the Barbados Port Inc at a cost of US\$24/m<sup>3</sup>. This was a sole source acquisition purchased that did not meet with IDB no-objection and was financed by GOB.
- 5.42 In both instances, the armour stone and the sand, the PAU presented technical justifications for the sole source purchase. The arguments could have been strengthened by demonstrating the cost effectiveness of the acquisitions. PAU would have benefited from additional support from the IDB Procurement Specialist regarding the content of technical and financial justification to justify the sole-source purchase.

#### Financial Management

- 5.43 As described above, the financial management of the CIP was originally intended to be the responsibility of the CZMU Accountant. The high turnover of CZMU Accountants and a lack of experience in the financial administration of IDB projects led the PAU Coordinator to assume responsibility for the financial management of the Programme.
- 5.44 Despite the lack of an experienced Financial Manager, the PAU Coordinator succeeded in correctly preparing the disbursement requests and in managing the Programme finances sufficiently well enough to move the Programme along. The sound financial management of the Programme was helped by the fact that that all Programme payments were made using Smartstream, the financial management software used by all GOB Ministries. All payments were made by cheques emitted by the Barbados Treasury Department. At the beginning of the CIP, all payment requests were sent to Treasury Records along with the corresponding documents. During the implementation of the CIP, this process was simplified; making it possible for the CZMU to send the payment requests on-line and the cheque would be printed at Treasury within half an hour, ready to be picked up.

- 5.45 Also, the fact that all Programme payments required the ex-ante no-objection of the IDB helped to ensure sound financial management of the Programme.
- 5.46 According to the IDB Financial Specialist, there were no significant issues regarding the disbursement requests that were prepared by the PAU. At most, clarifications and additional information were required of the PAU to complete the disbursement requests. The financial reports prepared by the financial reports prepared by the Chartered Accountant firm hired by CZMU, showing the estimated cost cumulative investments for the Project were accepted by the IDB. These reports, however, presented the estimated costs and cumulative investments at an aggregated level: at the level of the Component and Sub-Component.
- 5.47 During the implementation of the CIP, the IDB followed an ex-post procedure for disbursements. Accordingly, Programme costs were first paid with GOB funds and then, subsequently, Statements of Expenses with the supporting documents were submitted to IDB for reimbursement of the amount corresponding to Bank financing. This ex-post disbursement procedure was relatively uncomplicated compared to the ex-ante disbursement procedure that will apply for future IDB investment programmes. Under the ex-ante procedure, the executing agency will be required to request disbursements based on projected expenses. This procedure calls for strong planning skills including a capacity for detailed and accurate financial planning.
- 5.48 **Recommendation:** Continuity in the financial administration of Programme is important for good financial management. For future programmes executed by the CZMU (and for all programmes in general), it is recommended that a Financial Administrator -- preferably with experience in the financial management of projects -- be hired to provide dedicated (as opposed to shared with CZMU) services to the Programme. This will be all the more necessary due to the new fiduciary requirements introduced by IDB in 2010. Under the new requirements, disbursements will be made based on financial projections rather than ex-post on the basis of Statements of Expenses and invoices.
- 5.49 To ensure adequate financial management of the project, the financial code of accounts for the Programme should be established as a condition prior to first disbursement of Loan financing. The code of accounts should be included in a Programme Operation Manual and should be agreed upon by the IDB Financial Specialist in Barbados. For adequate financial administration of a programme such as the CIP, it is recommended that the financial administration at the activity level of detail.

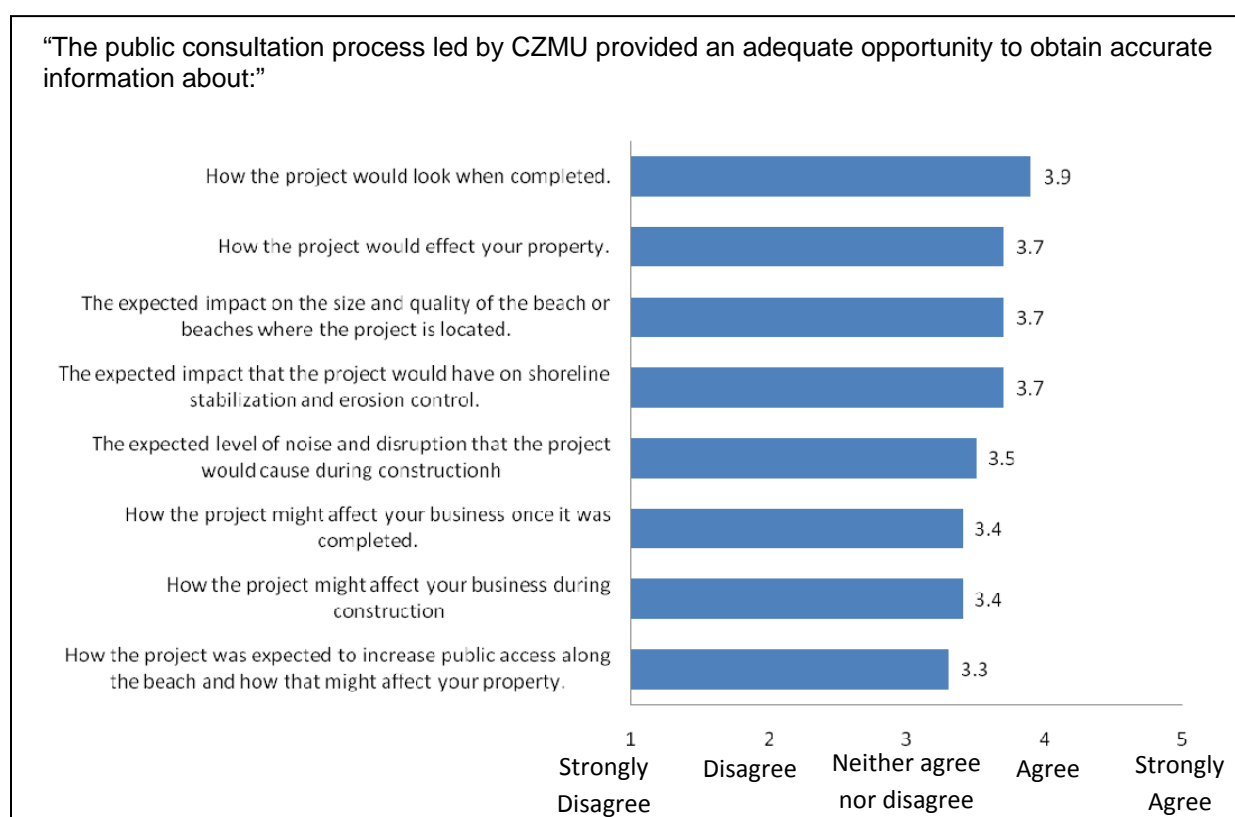
#### Communications Management

- 5.50 Communications management is an important part of good project management. The PAU, together with the Design and Supervision Consultants, implemented a comprehensive and extremely effective communications strategy that helped to ensure that property own stakeholders were adequately informed in a timely fashion of the impacts and consequences of proposed infrastructure projects. Moreover, the communications strategy -- in tandem with the final design process for the coastal infrastructure projects -- ensured that stakeholder concerns and recommendations were taken into account in the final designs, to extent possible while maintaining the technical integrity of the projects. The strategy combined one-on-one meetings together with public meetings. Stakeholders were provided with adequate opportunity to express opinions and recommendations concerning the project designs and construction process. The communication strategy focussed principally on the property owners and renters of the property that immediately abutted and abounded the sites of the infrastructure projects.



- 5.51 Figures 6 to 8 present the results of an internet survey regarding the public perception of the CIP, focusing on the public consultation process that was carried out by CZMU prior to construction and during construction of the project. The purpose of the public consultation process was to inform the public about the project and to get feedback from the public regarding the project design as well as any issues arising during construction. Survey respondents were asked to indicate whether and how strongly they agreed or disagreed with statements regarding the public consultation process led by CZMU.
- 5.52 Figure 6 presents survey results regarding the effectiveness of the communication strategy prior to construction of each coastal infrastructure project. Respondents were asked to indicate their opinion on a scale from 1 to 5, where 1 signified “Strongly Disagree” and 5 signified “Strongly Agree”

**Figure 6**  
**Effectiveness of Public Consultation Process Prior to Construction**

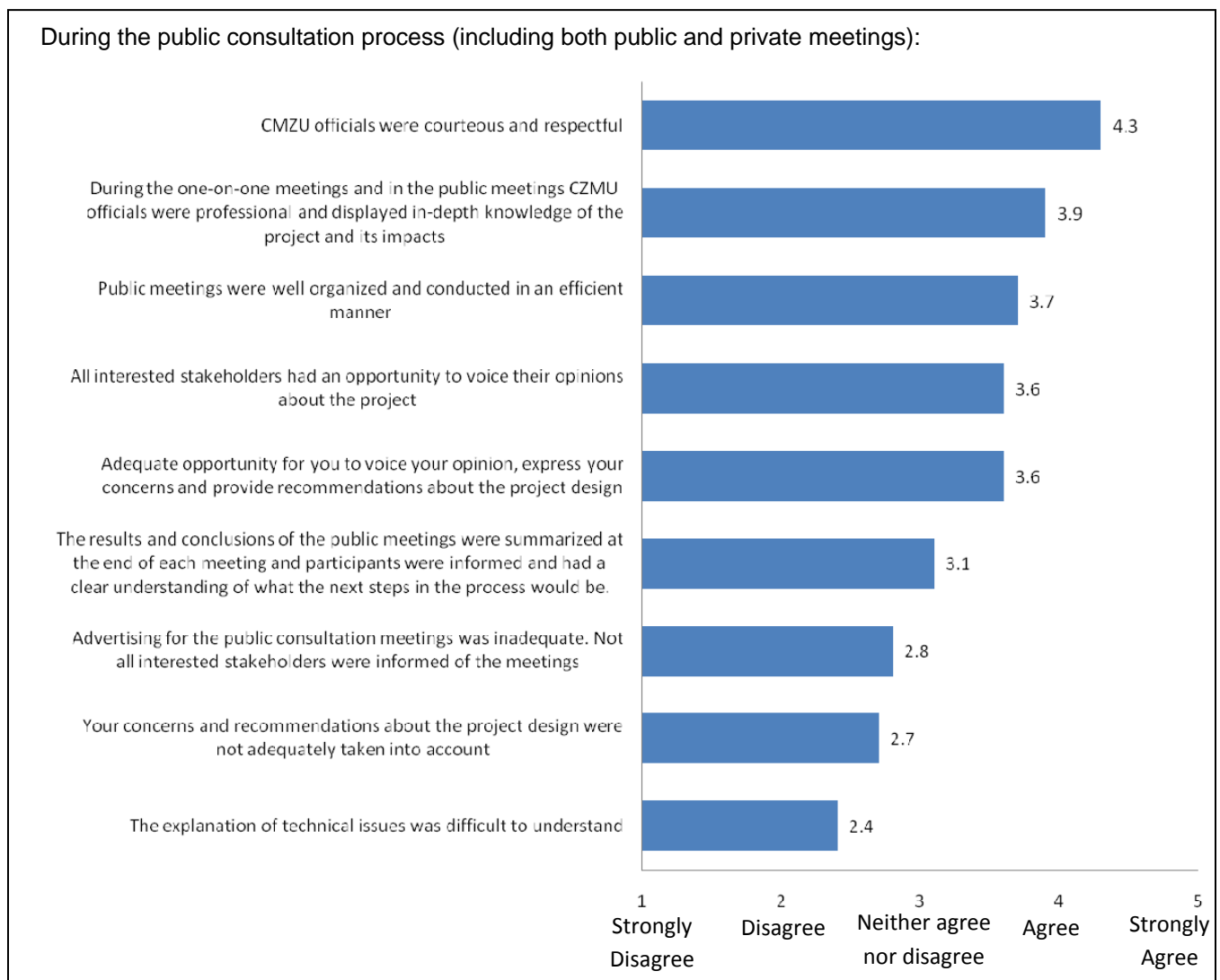


- 5.53 On average, the accuracy of pre-construction information provided during the public consultation process scored 3.5 out 5, which indicates that respondents considered the information accuracy to be between “average” and “good”. Respondents tended to agree that the public consultation process provided them with accurate information about the following: (i) how the project would look when completed; (ii) how the project would affect property; (iii) the expected impact on the size and quality of the beach; and (iv) the expected impact on shoreline stabilization and erosion control. Issues that scored above average (i.e. above a score of 3) but that stakeholders would have appreciated better communication included: (a) the expected level of noise and disruption that the project would cause; (b) how the project might affect business both during and post-

construction; and (c) how the project was expected to increase public access along the beach and how that might affect property.

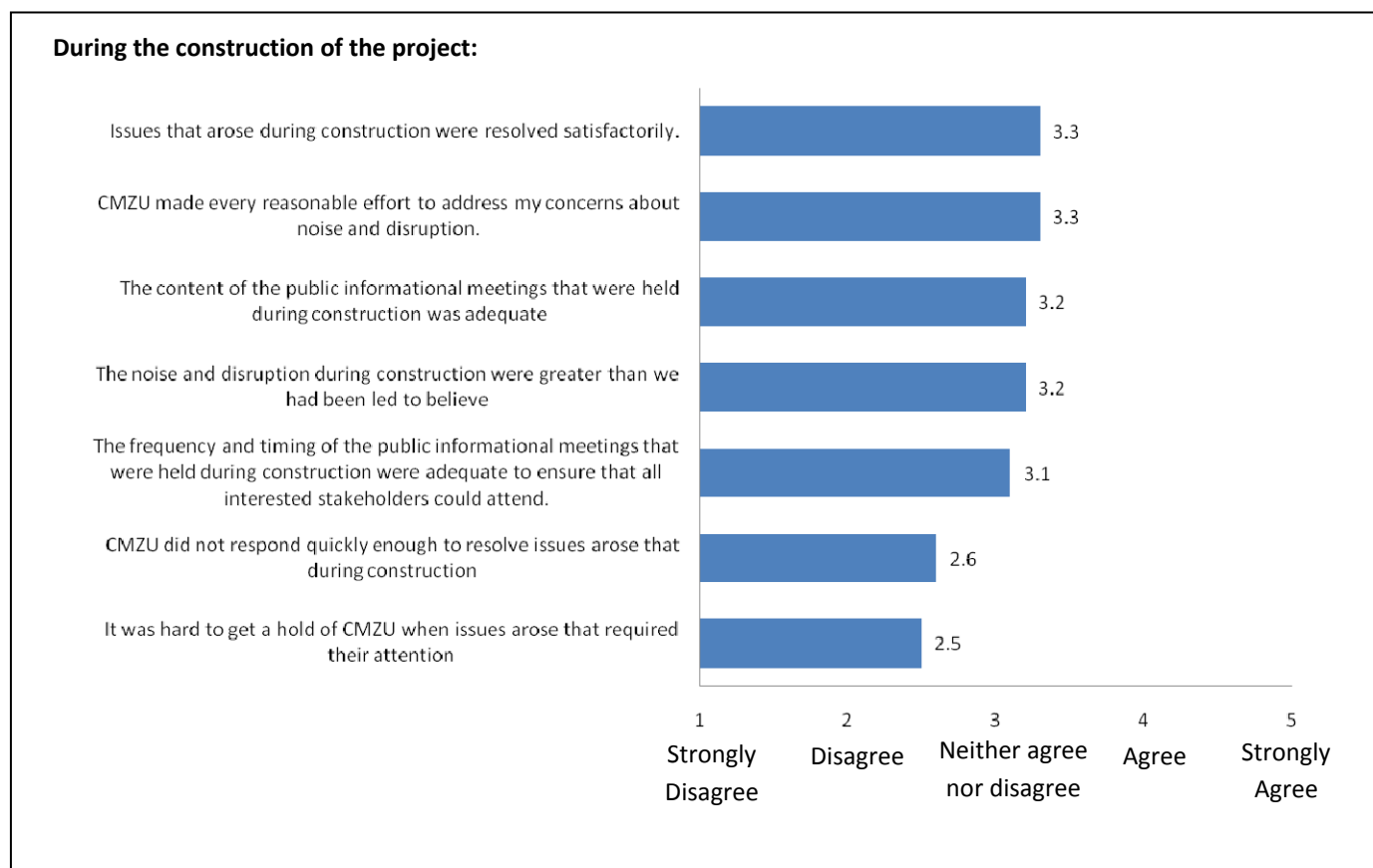
- 5.54 Figure 7 presents stakeholder perceptions regarding various aspects of the public consultation process and during construction. On average, stakeholders agreed that CZMU officials were respectful and courteous and displayed in-depth knowledge of the projects and their impacts. Stakeholders tended to agree that: (i) public meetings were well organized and conducted in an efficient manner; and (ii) all interested stakeholders had an opportunity to voice their opinions, express concerns and provide recommendations about projects. Stakeholders neither agreed nor disagreed with the statement that the results and conclusions of public meetings were summarized at the end of each meeting and had a clear understanding of what the next steps would be, indicating that there was room for improvement in this regard.

**Figure 7**  
**Stakeholder Perceptions Regarding the Public Consultation Process and During Construction**



- 5.55 On average stakeholders expressed ambivalence regarding the adequacy of advertising for public consultation meetings, indicating that there is room for improvement on the advertisement of such meetings, in order to ensure that all interested stakeholders are informed of the meetings in a timely fashion. Fifty percent of respondents agreed or strongly agreed that their concerns and recommendations about the project design were adequately taken into account, while 30% were ambivalent (neither agree nor disagree) and 20% disagreed or strongly disagreed. Technical issues were well explained: 70% of respondents did not find them hard to understand, while only 10% found them hard to understand.
- 5.56 Figure 8 presents stakeholder perceptions of communication effectiveness during Project Construction. On average, stakeholders were ambivalent (neither agree nor disagree) regarding communication effectiveness during construction. 60% of respondents indicate that it was not hard to get a hold of CZMU when issues arose that required attention. Only 10% of respondents strongly agreed that it was hard to get a hold of CZMU. 50% of respondents said that CZMU made every reasonable effort to address concerns about noise and disruption. Only 10% disagreed. 30% of respondents considered that the content of public information meetings held during construction were adequate. 10% disagreed. 50% of respondents indicated that the noise and disruption during construction was greater than they were lead to believe. 30% did not agree or strongly disagreed that noise and disruption were greater; 20% neither agreed nor disagreed. 30% of respondents agreed that the frequency and timing of public information meetings during construction was adequate; 20% disagreed and 30% were undecided (neither agreed nor disagreed). 50% of respondents felt that CZMU responded quickly enough to respond to issues that arose during construction. 10% of respondents strongly disagreed.

**Figure 8**  
**Stakeholder Perceptions of Communication Effectiveness during Project Construction**



- 5.57 The communication of the boardwalk concept for the Rockley to Coconut Court project required a high degree of effectiveness, because of the radical nature of the project. The idea, which was originally mooted by the Engineering Design and Supervision Consultants, of a three metre wide boardwalk met initially with scepticism, even within CZMU. Until that point, the tradition in Barbados and accepted standard had been to construct narrow footpaths to facilitate coastal access. The boardwalk was an entirely novel concept for the island, insofar as it would be used only to facilitate access, but also as a recreational destination for jogging and walking. In addition to the boardwalk, five aesthetically designed and landscaped headlands provide a social rendezvous point, as well as fulfilling their technical function of shoreline stabilization.
- 5.58 In the case of the Holetown Beach project, concerns expressed by stakeholders regarding the height of the boardwalk and proximity to existing buildings were taken into account. The resulting final design was lowered and the construction was set further away from buildings. This, in turn, resulted in higher deposits of sand on the walkway during storm surges that would otherwise have been the case. This design consequence was identified by the physical models constructed by the Engineering Design and Supervision Consultants, but was deemed acceptable insofar as it succeeded in partially addressing stakeholder concerns while achieving the goals of shoreline stabilization and coastal access.
- 5.59 One group of users of the Hastings Park, who are not owners of property abutting and abounding the sites, felt that they had not been adequately consulted prior to construction and created negative publicity regarding the Boardwalk. This situation might have been avoided had the public consultation process been extended to the general public.
- 5.60 **Conclusion:** The communication strategy employed by the PAU was very effective in dealing with property owners. The PAU displayed a strong ability to successfully and efficiently resolve -- to the satisfaction of stakeholders-- most issues that arose during construction of the projects.
- 5.61 **Recommendation:** For future projects it is recommended that a formal communications management plan be prepared, in tandem with a thorough stakeholder analysis. The stakeholder analysis should: identify all stakeholders; determine all of the requirements, expectations, and interests; and determine their level of influence. The communications management plan would detail how all stakeholders (not just property owners) will be communicated with.

### c) Usefulness and Timeliness of Reports

- 5.62 The timeliness and usefulness of the reports prepared the PAU were analyzed. The PAU prepared the following types of reports.
- Semestral Reports;
  - Annual Maintenance and Monitoring Report (2008 and 2009);
  - Audited Financial Statements were presented for the years 2003 through 2009;

#### Semestral Reports

- 5.63 The PAU prepared semestral progress reports (14 volumes in all ending with Semestral Report No. 14 April 1, 2009 to September 30, 2009). The format for the semestral reports was provided to CZMU by the IDB. The reports are particularly useful in the description they provide of the progress of project execution. They contain rich details for each project regarding the key activities such as final designs, physical modelling, pre-qualification, procurement, right-of-access and land acquisition issues; approval, construction, and project completion. The reports also provided information on: contractual clauses; programme financing and investments; targets for

coming semesters; issues and problems encountered and recommend solutions; and lessons learned. In addition, the reports included annexes of the overall project schedule, a matrix of contractual obligations; cost and financing table; and the logical framework matrix.

- 5.64 **Timing:** According to the Loan Contract Article 7.03, reports on the execution of the Project were required to be submitted within sixty (60) days following the end of each calendar Semester, on July 31st and November 30<sup>th</sup> of each year. The average delay in submission of the reports was 70 working days<sup>9</sup>.
- 5.65 **Usefulness:** One of the factors that contributed to the delay in submission was the continuous narrative format of the report, which proved to be relatively time consuming as it required the PAU Coordinator (who prepared the reports) to update the verb tense of each successive version, converting present tense to past tense and future to present. The advantage for the reader, though, is that each successive report essentially contains all of the information of previous reports. Thus, the reader does not need to read each report separately and try to piece together the sequence of events. This presentational style makes it much easier to understand and appreciate the sequencing of key events that affected Programme implementation. As an ex-post documentation of the issues and problems affecting Programme implementation, the Semestral Reports contain a wealth of useful, detailed information that has proved invaluable for the final evaluation of the Programme.
- 5.66 A weakness of the semestral reports is that they do not allow a “quick and easy” comparison of planned and actual activities, nor of the financial and physical advance of the Programme. The reports include “high level” information on the Programme’s financial execution, at the Component and Sub-Component level. This information is not sufficiently detailed to provide an informed understanding of the Programme’s financial performance. One would need to know, in addition, the planned and actual disbursements for each project and consultancy. The question is: what is the purpose of the semestral reports? Are they intended merely to provide documentation of the fulfillment of contractual aspects of the Loan Agreement; or are they intended, additionally, to provide information that would allow for project management support. If so, the usefulness of the semestral reports would be further enhanced by including implementation metrics, such as the ratio of planned and actual unit cost per linear metre of coastal infrastructure (this would need to be project-specific), or the ratio of financial progress to physical progress.
- 5.67 The semestral reports should be designed to ensure that they provide useful information to all users of the report. During project preparation the Stakeholder Analysis should identify what the specific requirements of each user are, and the specific format of information should be agreed upon.
- 5.68 **Recommendations:** Regarding the Semestral Reports:
- i) Maintain the useful, on-going narrative approach for the description detailing the progress of project execution. It greatly facilitates and understanding of important issues that arose during Programme implementation;
  - ii) To enhance the usefulness of the Semestral Reports, more concise and useful information should be added to permit a quick comparison of planned and actual progress, as well as a comparison of physical and financial progress. It is recommended that a Gantt chart be

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<sup>9</sup> Based on the information presented in Annex II, Matrix of Contractual Obligations, Semestral Report No. 14.

included that provides a comparison of actual and planned activities. The progress Gantt charts should be prepared in Microsoft Project and the PAU should be provided with training in the effective use of this software including Programme Evaluation and Review Technique (PERT). The level of detail of activities should correspond to the principal project tasks and such as design, approval, stakeholder consultations, right-of-access, land acquisition; construction, completion. Key administrative tasks such as semestral and project completion reports, annual audit, procurement plans. The progress chart should present the planned activities as detailed in an Annual Plan of Operation. Actual progress should be overlaid atop the planned progress to permit a visual and numeric (percentage completed) comparison;

- iii) The semestral reports should also include a summary table, based on the Programme Results Matrix (or Logical Framework), that provides a comparison of planned and actual outcomes and outputs;
  - iv) A summary financial table should be provided showing the planned and actual financial progress. The financial table should provide a greater level of detail than is contained in the financial table that accompanies the Project Loan Agreement or Project Inception. Typically, the financial table from the Project Loan Agreement provides information at the Programme component and Sub-Component level. In a programme such as the CIP, in order to obtain a good understanding of financial progress, it is necessary to have information at the Project level (e.g. the cost of the Rockley to Coconut Court project and the other coastal infrastructure projects) and activity level (such as the cost of final design, physical models, or individual consultancies).
- 5.69 The level of detail in the financial tables should be established in the Programme's financial code of accounts, which should form a part of the Programme Implementation Plan that should be prepared at the outset of the Programme and should receive the no-objection of the IDB. It is recommended that the code of accounts used by the Government of Barbados be used for future Programmes. This would require use of a financial software programme. It is recommended that the purchase of the Smartstream project accounting module be considered. This module would facilitate the Programme's financial administration and ensure ease-of-integration with the Smartstream financial administration software used by the Government of Barbados.
- 5.70 The semestral reports should include a summary table, based on the Programme Results Matrix (or Logical Framework), that provides a comparison of planned and actual outcomes and outputs.
- 5.71 The semestral reports should provide information on the total budget and total cost of each project. Thus, for example, the semestral report should provide information on the total cost of the Rockley to Coconut Court project.

#### Annual Maintenance and Monitoring Reports (AMMR)

- 5.72 As required by the Loan Contract, CZMU has prepared an annual maintenance and monitoring report for 2008 and 2009. The AMMR reports on the monitoring parameters that were determined by the CIP's environmental consultants. The AMMR presents water quality and beach profile information for Welches Beach and select locations along the Rockley to Coconut Court project. The Hometown Beach project was only completed in 2009 and therefore the first maintenance and monitoring report for that project will be found in the AMMR for 2010.
- 5.73 For both the Welches Beach project and the Rockley to Coconut Court project, the proposed monitoring programme for this project included monitoring of the following parameters: (i)

marine water quality; (ii) marine communities; and (iii) spur/groyne monitoring. Aside from possible short-term turbidity during construction, this project was not expected to impact upon either marine water quality (proper precautions taking during construction avoided the creation of turbidity) or on marine communities (both projects were built landward of marine communities).

- 5.74 **Recommendation:** The requirement that CZMU report annual on marine water quality and marine communities for the Welches Beach project and the Rockley to Coconut Court project should be rescinded. The AMMR should continue to report on the beach profile, but the series of graphs that are presented should be accompanied by a brief technical analysis that would summarize the findings regarding beach stability.

#### Audited Financial Statements

- 5.75 As stipulated in the paragraph 7.03(iii) of the Loan Contract, financial statements for the entire Programme were to be presented to the IDB within 120 days following the close of each fiscal year of the Executing Agency.
- 5.76 As a result of a miscommunication on the part of the IDB on the one hand and misunderstanding on the part of the CZMU on the other, the audited financial reports of the project were not prepared on an annual basis for the years ending 2003, 2004, 2005, and 2006. As the Semestral Reports explain, “up until the financial year ending March 2007, only GOB funds had been utilized. As a result, requests for waivers for the submission of financial statements for those respective years were sent to the IDB and waivers were granted for submission of the financial statement 2003 to 2006”<sup>10</sup>. The PAU interpreted these waivers to mean that it was not required to have audited financial statements of the project prepared. Based on this interpretation, audited financial statements were not prepared for the years ending 2003, 2004, 2005 and 2006.
- 5.77 As the Semestral Reports go on to explain, “The Governments did not have the financials... audited by the external auditors because: the financial statements were audited by the government auditors and; none of the Loan funds were expended during the preceding periods”. However, the audit carried out by Treasury was of the CZMU as a whole and not of the PAU in particular.
- 5.78 In June 2008, IDB clarified to CZMU that, notwithstanding the waiver for the presentation of audited statements, IDB nonetheless required that audited financial statement be prepared for the years ending 2003, 2004, 2005 and 2006. This was requested because the external audit for 2007-2008 was qualified because the auditors were unable to verify the expenditures for the previous years.
- 5.79 The financial reports for these years were subsequently prepared and submitted to the IDB in March 2009. According to the Semestral Reports, “IDB expressed concern for the delay in the present of the Statements and encouraged that every effort should be made” to ensure that subsequent statements were presented on or before July 31.
- 5.80 One problem with the audit process is that the same firm that prepared the PAU’s financial statements also carried out the audit of the PAU. To ensure transparency, generally accepted accounting procedures require that the firm that performs the external audit be separate and distinct from the firm that prepares the financial statements.

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<sup>10</sup> CZMU. Semestral Report No. 14, April 1, 2009 – September 30, 2009. P. 11.

- 5.81 This potential problem caused by this situation was mitigated to a large extent by the fact that all Programme disbursements were made through the financial management software called Smartstream, used by all GOB Ministries.
- 5.82 The final financial statements were delayed due to an oversight on the part of the IDB. Normally, IDB's policy requires the final financial statement to be submitted within 120 days of the date of final disbursement. This stipulation was not included in the CIP Loan Agreement, however, and as a result the final financial statement was submitted three months later.
- 5.83 As a lesson learned, annual financial statements should also be required even if there is no IDB financing involved. For adequate monitoring and evaluation of Programme financial execution it is always necessary to have accurate information on annual disbursements by financier for each year of the Programme.
- 5.84 **Recommendations:** For future programmes it is recommended that audited financial statements be required on an annual basis, regardless of whether IDB financing is involved in a given year.
- 5.85 To help ensure transparency, for future programmes, the firm that performs the external audit of the Programme Administration Unit must be separate and distinct from the firm that prepares the financial statements of the PAU.
- 5.86 The Loan Agreement should stipulate that the final financial report is due within 120 days of the final disbursement date of the Programme.

#### **g) Cost-Benefit Analysis**

- 5.87 During preparation of the CIP, economic cost-benefit analysis (COBA) was done for the following coastal infrastructure projects: Rockley Beach to Drill Hall; Woman's Bay; Crane Beach; and Welches Beach. During the Programme's implementation the Rockley Beach to Drill Hall project was modified to incorporate a boardwalk and the length of the project was reduced by around 225 meters such that the redesigned project would extend from Rockley Beach to Coconut Court. The Woman's Bay project and Crane Beach projects were not implemented. Welches Beach was implemented without IDB financing.
- 5.88 In this present section, the economic cost-benefit analyses that were performed during Programme preparation for Rockley Beach to Coconut Court project and the Welches Bay project are scrutinized to confirm and validate the assumptions and calculations. The Holetown Beach project was not analyzed during programme preparation and is therefore not included here. The cost-benefit analyses are revised to more reflect final costs and actual benefits.

#### Rockley to Coconut Court

- 5.89 According to the COBA carried out during programme preparation, the project was "expected to enhance beach quality between (but excluding) Drill Hall beach and Rockley Beach... In the with-project situation, the beaches will be raised to a standard commensurate with other south coast beach such as Rockley Beach<sup>11</sup>". This basic premise is fundamentally incorrect. Rockley Beach is one of the premier beach destinations for bathing in Barbados. The Rockley to Drill Hall project (and the Rockley to Coconut Court) project did not improve any of the beaches between along the project's length to a quality commensurate with that of Rockley Beach. In places where the beach was enhanced along the project's length, the resulting improvements did not create beaches that

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<sup>11</sup> Halcrow, March 1999. P. 1-14



would be chosen as destinations for swimming or spending time on the beach. One of the characteristics of the near-shore area along the project's length is that, in many areas, it is characterized by corral rubble, which makes it unattractive for bathing. It is important to note that the corral rubble plays an important role in the natural nourishment of beaches, so that clearing the rubble for bathing is not a recommended practice. Furthermore, the enhanced beaches are too narrow and, for the most part, too steep to make them attractive destinations for swimmers and beach-goers. Having made these clarifications, it should be noted that the beach enhancements resulting from the project have created sufficient new beach area to create new nesting habitat for sea-turtles.

- 5.90 The COBA carried out during programme preparation assumed that all properties within 750 meters of the project would benefit in the form of increased land value. The assumption that property that are near to but that do not abut or abound the project proved to be incorrect. In reality, however, only properties that immediately abut and abound the properties may possibly have benefitted from a slight increase in property value. In point of fact, beach front property in Barbados is worth around US\$200/square foot, with or without the project. The project may have resulted in a 1 to 3 percent increase in property value due primarily to the increased protection against erosion that is afforded by the revetments and headlands.
- 5.91 The COBA carried out during programme preparation estimated that a total of 1371 properties would benefit from the project. In reality, the project only directly benefited the 19 properties that abut the project. That is to say, only 19 properties potentially benefitted from increased property values.
- 5.92 Regarding the assumption that the project would result in an increase in property value, it must be remembered that not all property owners or potential buyers necessarily regard in a positive light or as a benefit the prospect of increased shorefront foot traffic. Before the project, there was little foot traffic and home owners essentially enjoyed a private shorefront. For prospective buyers, the benefit of increased shoreline stabilization may be partially offset by the prospect of reduced privacy.
- 5.93 The COBA carried out during programme preparation assumed that the project would "create new beaches for both Barbadian and stay-over tourist use, which will in turn have an effect on the visitation rates at the other beaches throughout the island<sup>12</sup>". As has been explained, the project did not create new destination beaches. It is not realistic to assume to that this project on its own – nor the three projects that were implemented during the CIP – would lead to a measurable impact on visitation rates at other beaches.
- 5.94 The COBA argued is that "it is expected that there will be benefits from increased commercial and hotel trade". Indeed, the stakeholder survey carried out as part of this present evaluation provides some evidence that commercial properties perceive that business has increased from 1 to 5 percent as a result of the project. It is important to note, however, that this increase in business is at the expense of other restaurants that are not located along the project and therefore does not represent a net gain for the Barbadian economy. Because the estimated benefit accruing to individual enterprises from increased business constitutes a "zero sum game" (a situation in which a participant's gain or loss is exactly balanced by the losses or gains of the other participants) must not be included in the cost-benefit calculation. For public investment programmes such as the CIP, COBA should be used to calculate the incremental benefit to the economy as a whole.

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<sup>12</sup> IBID

- 5.95 Based on the assumption that the project would create new beaches that would provide a closer alternative than existing beaches for swimming and beach-going, the COBA calculated the increased value of all properties within 750 metres of the coast near the project<sup>13</sup>.
- 5.96 The COBA calculated the avoided loss of property value as a result of the project. The estimate is based on 1371 properties rather than the 19 properties that abut the project and are directly affected by the project.
- 5.97 The COBA estimate of avoided loss of property values as a result of the project are generated from an econometric model that attempts to explain the price per square foot of land in terms of size of the property, distance from Bridgetown, distance from the nearest beach and distance from the coast and two other variables that are not defined. There are limitations with this model: it only succeeds in explaining 38% of property price, meaning that it only explains around one-third of land price variation. Also, two of the supposedly independent variables are actually correlated: distance from the nearest beach and distance from the coast. Despite the limited explanatory power of the equation and the correlation between the two variables, the model is used to provide the following estimate: “for every percentage increase in distance from the nearest beach, price declines by 0.71 per cent”. Conversely, according to this model the price increases by 0.71 per cent for every percentage decrease in distance to the nearest beach.
- 5.98 For 1371 properties included in the sample were divided into five categories (modern housing, traditional housing, vacant lots, hotels and commercial). Each category, in turn, was divided into one of four size classes. The average distance from the “new” beach that was supposedly to be created by the project was then estimate and the “benefit” was calculated as the percentage reduction in distance to the new beach times 0.71 per cent times the “without project” price, which had been estimated based on a land value map.
- 5.99 In addition to the economic model, the COBA for Rockley Beach to Drill Hall also estimated the economic benefits to Barbadians on outings, as well as changes in tourism expenditures.
- 5.100 The estimate of changes in tourism expenditures was based on the erroneous assumption that the project was designed to maintain Rockley Beach. In fact, the maintenance of Rockley Beach was the goal of the investment Programme that preceded the Coastal Infrastructure Programme, but was not a goal of the CIP itself.
- 5.101 COBA estimated the project benefits to Barbadians on outings by estimating the number of annual outings by Barbadians to Rockley Beach and assigning a value per outing per Barbadian of BD\$0.20. The methodology would be valid for a project the goal of which was to maintain the stability of Rockley Beach, but is not valid for the Rockley Beach to Coconut Court project. Moreover, the estimated utility of outing per Barbadian of BD\$0.20 is not explained in the COBA.
- 5.102 In conclusion, the econometric model used to in the COBA of the Rockley Beach to Drill Hall project was based on two faulty assumptions; (i) that the project would create new beaches and that the new beaches would be of a calibre equivalent to that of Rockley Beach. While the project did in fact create some new beach areas and expand existing beach areas, the resultant improvement did not create new “bathing” beaches as they are too narrow (and therefore cannot support the introduction of shade trees) and for the most part the near-shore water is strewn with corral rubble that is crucial to beach nourishment. A new breakwater at west end of the project does provide protection to a small, existing beach and has lead to some accretion that has

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<sup>13</sup> The COBA for Rockley Beach to Drill Hall includes a table entitled “Avoided loss of property values as a results of Rockley Beach to Drill Hall”, however

benefited the abutting hotel. But for the most part, the purpose for the beach improvements on the Rockley Beach to Coconut Court project was not to create new destination beaches, but rather to alter wave patterns as a means to reduce erosion. The slight widening of beach reduces the intensity of wave action on the shore, which is an important design feature of the project to mitigate the effects of erosion and storm surge on the boardwalk. Since no new destination beaches were created, the assumption on which the econometric model was incorrect. Therefore the project did not affect the price of properties that do not immediately abut the project. Therefore the econometric model and the estimated benefits it generated are invalid.

- 5.103 There are errors in assumptions related to the calculations of the economic benefits to Barbadians on outings, as well as changes in tourism expenditures

Revised Cost-Benefit Analysis of the Project

- 5.104 To derive a cost-benefit analysis of the project, it is necessary to know the project's total cost, include final design, physical modelling, supervision and construction. PAU financial statements do not provide disbursement information that permits the calculation of the project's total cost. The audited financial statements are at the sub-component level and do not provide information on specific project costs. The unaudited spreadsheets used by PAU to keep track of project expenses provide more detailed information. Total cost of the Rockley to Coconut Court project is estimated to be \$16,730,816. Maintenance costs to commence in Year 3 and are assumed to equal 0.3% of investment costs (civil works plus armour stone and sand) in Year 3 and to increase by 10% per year through Years 4 through 17.
- 5.105 The project has generated two types of benefits: (i) recreational/leisure benefits; and (ii) erosion mitigation benefits.
- 5.106 Recreational/leisure benefits are calculated based on conservative assumptions that are based on empirical observation during the evaluation consultancy. An estimated 400 people use the boardwalk each day and that 50% of the users are residents and 50% are tourists. The average use of the boardwalk per person per use is assumed to be 30 minutes. It is also assumed that due to inclement weather the boardwalk is only used 320 days per year. The value of each use is assumed to equal the estimated average hourly wage of users: US\$5/hour for Barbadians (twice the minimum wage); and US\$25/hour for tourists (based on the assumption of couples in single income households).
- 5.107 Erosion mitigation benefits were calculated based on the assumption that, without project, the length of property that is now protected by the project's revetments and headlands would continue to be prone to erosion and storm surge and that land would continue to be eroded at the rate of one foot per year along the 1.2 kilometres of the project's length. Coastal land is currently valued at around US\$200 per square foot.
- 5.108 Based on these assumptions, a 17 year cashflow projection was developed (see Table 17) and the internal rate of return was calculated to be 12%, indicating that the financial feasibility of the project.

**Table 16**  
**Estimated Total Cost of the Rockley to Coconut Court Project**

	GOB	IDB	Total
Fixed fees (design phase) /a	\$38,169	264,799	\$302,968
Physical modelling /b		\$476,419	\$476,419
Professional services (construction observation)	\$182,126.46	\$796,485.26	\$978,612
Armour stone and sand /c	\$1,236,656.36		\$1,236,656
Civil works	\$5,016,229.99	\$8,719,931.18	\$13,736,161
	\$6,473,182	\$10,257,634	<b>\$16,730,816</b>

B/ Calculated as the total cost of physical modelling multiplied by the cost of Rockley-Coconut Court civil works divided by the total cost of civil works for the three coastal infrastructure projects.

/c Calculated as the total cost of armour stone and sand multiplied by the cost of Rockley-Coconut Court civil works divided by the total cost of civil works for the three coastal infrastructure projects.

**Table 17**  
**Rockley to Coconut Court Project: Seventeen Year Projection of Costs and Benefits**

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>1. Costs</b>					
1.1 Construction	<b>-\$16,730,816</b>				
1.2 Maintenance			<b>-\$29,946</b>	<b>-\$32,940</b>	<b>-\$36,234</b>
<b>2. Benefits</b>					
2.1 Recreation		1,920,000	1,920,000	1,920,000	1,920,000
2.2 Erosion mitigation		787,400	787,400	787,400	787,400
<b>TOTAL</b>	<b>-\$16,730,816</b>	<b>\$2,707,400</b>	<b>\$2,677,454</b>	<b>\$2,674,460</b>	<b>\$2,671,166</b>

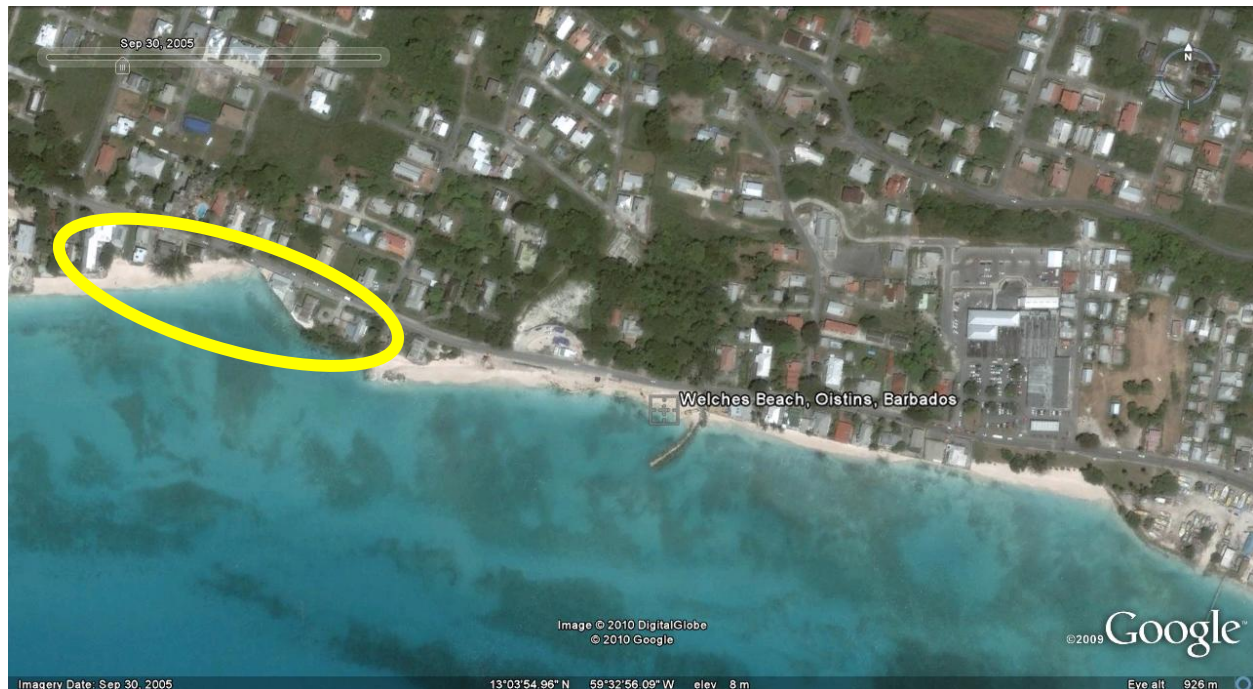
	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
<b>1. Costs</b>						
1.1 Construction						
1.2 Maintenance	<b>-\$39,858</b>	<b>-\$43,843</b>	<b>-\$48,228</b>	<b>-\$53,051</b>	<b>-\$58,356</b>	<b>-\$64,191</b>
<b>2. Benefits</b>						
2.1 Recreation	1,920,000	1,920,000	1,920,000	1,920,000	1,920,000	1,920,000
2.2 Erosion mitigation	787,400	787,400	787,400	787,400	787,400	787,400
<b>TOTAL</b>	<b>\$2,667,542</b>	<b>\$2,663,557</b>	<b>\$2,659,172</b>	<b>\$2,654,349</b>	<b>\$2,649,044</b>	<b>\$2,643,209</b>

	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17
<b>1. Costs</b>						
1.1 Construction						
1.2 Maintenance	<b>-\$70,610</b>	<b>-\$77,671</b>	<b>-\$85,438</b>	<b>-\$93,982</b>	<b>-\$103,380</b>	<b>-\$113,718</b>
<b>2. Benefits</b>						
2.1 Recreation	1,920,000	1,920,000	1,920,000	1,920,000	1,920,000	1,920,000
2.2 Erosion mitigation	787,400	787,400	787,400	787,400	787,400	787,400
<b>TOTAL</b>	<b>\$2,636,790</b>	<b>\$2,629,729</b>	<b>\$2,621,962</b>	<b>\$2,613,418</b>	<b>\$2,604,020</b>	<b>\$2,593,682</b>

### Welches Beach Project

- 5.109 The primary objective of the Welches Beach project was to “widen the beach and thereby protect the roadway from flooding and undermining of the seawall. A secondary benefit of the beach widening was an improved beach amenity”. The Cost-Benefit Analysis (COBA) for Welches Beach carried out during the preparation of the CIP a correctly identifies that the “most important benefit is the securing of the road from storm damage”, but errs in its approach to estimating the erosion-mitigation benefit. The COBA assumes erroneously that, without-project, the beach would gradually erode to such an extent that it would cease to exist. Based on this assumption, the COBA then went on to assume that, as in the case of the original COBA for Rockley to Coconut Court, the value of property within 750 of Welches Beach would fall in relation to the distance to the nearest alternative beach. It should be mentioned that as a destination beach, Welches Beach is not heavily used for swimming and leisure, perhaps because it is very exposed to the passing traffic on the coastal road, lacks any kind of vegetation for shade, and does not have a public parking lot.
- 5.110 Although the improved beach amenity is a secondary impact of the project, the COBA estimates of benefits due to avoided property value loss far exceeds the estimated benefit due to avoidance of the closure of the coastal road. This would not be issue, had the estimates been based on realistic assumptions; they were not, however: the COBA identified 1019 properties that would benefit from the project. A realistic estimate of avoided property-loss value would be limited to the four or five properties that were directly threatened by erosion and storm surge (outlined in the yellow oval in Figure 9).

**Figure 9**  
**Satellite Photograph of Welches Beach showing properties that directly benefited from the Project**



- 5.111 The original COBA estimated the benefit that the avoided closure of the coastal road due to erosion and storm surge. The COBA indicated that the avoided costs would include: (i) the road

repair; (ii) the cost in terms of wear and tear on vehicles, fuel and lubricant due to the road diversion; (iii) costs incurred from impeded access to commercial enterprises; and (iv) the “costs of revetment and retaining wall already budgeted in the proposed works”. This last point is a methodological error: it is not valid to include the cost of the project in the “without project” scenario. Also, it should be pointed out that t COBA estimated the cost of road repair and time loss but did not, however, estimate the impact on commercial enterprises.

Revised Cost-Benefit Analysis of the Welches Beach Project

5.112 Total cost of the Welches Beach project is estimated to be \$1,790,900 including final design, construction supervision, armour stone and sand and the civil works.

**Table 18**  
**Estimated Total Cost of the Welches Beach Project**

	GOB	IDB	Total
<b>Fixed fees (design phase) /a</b>	26,620	184,680	211,300
<b>Professional services (construction observation)</b>	148,053		148,053
<b>Armour stone and sand /b</b>	19,945		19,945
<b>Civil works</b>	1,411,602		1,411,602
<b>TOTAL</b>	<b>1,606,220</b>	<b>184,680</b>	<b>1,790,900</b>

a Calculated as the total cost of physical modelling multiplied by the cost of Welches Beach civil works divided by the total cost of civil works for the three coastal infrastructure projects.

/b Calculated as the total cost of armour stone and sand multiplied by the cost of Welches Beach civil works divided by the total cost of civil works for the three coastal infrastructure projects.

5.113 The without-project scenario assumes that the constant erosion and frequent storm surge would result in the closure of the coastal road to Oistens, necessitating reparation of the road and retaining walls. As with the original COBA, it is assumed that the procurement process and road reparation would take 9 months to complete; an optimistic estimate. The project has generated two types of benefits: (i) avoidance of road repair costs; (ii) avoidance of time lost due to construction detours; and (ii) avoid of fuel costs related to travelling around the detour route.

5.114 The original COBA assumed road repair costs of US\$1 million. This is a high estimate, since the actual length of road damaged by erosion would be relatively short. Thus, a “quick fix” reparation would likely cost no more than US\$500,000.

5.115 The original COBA cited a traffic survey from 1998 that found 14,940 vehicles passed through Oistins in a 24 hour period (the survey was conducted from a Sunday to a Monday). The COBA considers this “to be an over-estimate of the traffic passing Welches Beach” so for the present analysis it is assumed that 75% of that traffic passed along Welches Beach. It is also assumed that: (i) 11,205 vehicles ( $14,940 \times 75\%$ ) pass daily along Welches Beach; (ii) following breach of the coastal road, the road would be closed for a period of nine months; (iii) there is one passenger per vehicle (a conservative assumption); (iv) the detour adds 2 kilometres and 15 minutes of time per trip; (v) that each passenger’s time is valued at the minimum wage of US\$2.50/hour.

5.116 Based on these assumptions, the internal rate of return was calculated to be 52%, indicating that the financial feasibility of the project.

Table 19

	Costs	Benefits
<b>1. Cost</b>		
<b>1.1 Final Design</b>	-\$211,300	
<b>1.2 Construction supervision</b>	-148,053	
<b>1.3 Armour stone and sand</b>	-19,945	
<b>1.4 Civil works</b>	-1,411,602	
<b>Benefits</b>		
<b>time</b>		1,890,844
<b>Fuel and lubricants</b>		322,704
<b>Road repair</b>		500,000
<b>TOTAL</b>	<b>-\$1,790,900</b>	<b>\$2,713,548</b>

- 5.117 **Recommendation:** For the preparation of new investment programmes, it is recommended that all coastal infrastructure projects be subject to cost/benefit analysis. It is important that all of the investments and recurring costs associated with the project be included (including design, construction, supervision and maintenance). The results of the cost benefit analysis should be included as one of the criteria for the prioritization of projects.
- 5.118 Cost/benefit analysis should be written with policy-makers in mind. The economic analysis must be based on sound logic and conservative, realistic assumptions. If econometric models are used to make the economic argument, then any weakness in the econometric results should be explained in layman terms.
- 5.119 It is recommended that CZMU prepare a procedural guide to the cost benefit analysis of coastal infrastructure projects. The procedure guide should be based on real-life projects.

## 6 RECOMMENDATIONS AND LESSONS LEARNED

6.1 This section presents a summary of the recommendations presented in the earlier sections of this evaluation, as well as the lessons learned.

### a. Programme Preparation and Design

- 6.2 It is essential to identify all programme stakeholders and to analyze each stakeholder's potential impact or influence and identify ways to manage those impacts effectively. Classification tools such as power/interest grids and salience models can be used to group stakeholders by qualifications like authority level, impact or influence, or requirements. These classifications can then help the project manager determine how, what, and when to communicate with each stakeholder. This will serve as the basis for developing a stakeholder register, a stakeholder management strategy and a communication plan for the Programme [para 3.21; para 3.63].
- 6.3 It is essential that all performance indicators for the Programme be carefully constructed to ensure that they are specific, measurable, achievable, relevant and time-bound [para 3.32]
- 6.4 To strengthen the planning and design of future investment programmes, the following planning documents should be prepared as part of programme preparation: (i) a scope management plan; (ii) a work breakdown structure (WBS); a network diagram showing the sequence of programme activities; (iv) a critical path for each of the projects comprising the Programme; (v) a Programme Implementation Plan; and (vi) Annual Plans of Operation [para 3.44].
- 6.5 Building upon the Delcan prioritization methodology, the Coastal Infrastructure Prioritization methodology should be revised by CZMU to resolve the methodological issues. It is important that the methodology should be transparent, easy to understand (for explanation to stakeholders) and based on clearly defined, objective criteria. Also, CZMU should develop a standardized approach for the cost-benefit analysis of alternate investment projects. All projects should be subject to cost-benefit analysis as part of the prioritization process, but the methodology used in the cost-benefit analysis must make sense and should be approached from a "business case" perspective by presenting the argument (or "case" as the word is used in a legal context) for the investment to be made. The economic argument or case must be presented in a language that is geared towards the decision-making stakeholders. As a standard operating procedure, CZMU should periodically revise and update the list of investment priorities [para 3.48].
- 6.6 The Coastal Zone Management Plan identifies access to coastal areas as a priority concern in the coastal zone management of Barbados. Access to the coast may defined in the following ways: i) lateral access (access along the shoreline); vertical access (physical access to the shoreline); ii) co-lateral access (related to the presence of co-lateral infrastructure such as parking facilities); iii) visual access (an open view to the ocean from the road); and iv) socio-economic access (related to the conditions for the enjoyment of all socio-economic segments of society to a beach or other coastal area). The CIP succeeded in extending the lateral access to coastal areas. For projects that



include increased coastal access as a performance indicator, the type of coastal access should be specifically identified [para 3.49].

- 6.7 The risk assessment analysis undertaken during project preparation should include the high property turnover rate as an issue that may impact stakeholder buy-in as well as affect construction access. The stakeholder communication strategy should take into account the possibility of property turnover and include a description of communication process that will be used to try to address possible concerns and bring new property owners on-board [para 3.51]
- 6.8 For future investment programme, a formally-defined communication strategy should be developed based on and reflecting the results of a thorough stakeholder analysis [para 3.57].
- 6.9 For future investment programmes, a thorough risk management plan should be developed and implemented. The risk management plan should define risk categories for each stage of the project cycle and be linked to the stakeholder communication strategy. The risk identification process should involve all stakeholders in addition to the core project team. As part of the risk management process, qualitative risk analysis should be performed, including the development of a probability and impact matrix. The risk mitigation strategies and planned risk responses should be defined [para 3.60].

#### **b. Programme Effectiveness**

- 6.10 For the follow-up to the CIP, the only projects that should be included are the Holetown Lagoon Project and the Tent Bay-Boat Access and Slipway Project. With regard to Tent Bay project, it should be noted that there approximately fifteen small fishing boats currently use the beach and slipway. Based on a discussion with two fisherfolk (one of whom was a boat captain), it does not appear that the volume of fish that is currently fished would increase as the result of an improved slipway, so the economic justification for the project can probably be demonstrated based on increased value of sales. However, the current state of the slipway is precarious and represents a hazard to the physical well-being of the fisherfolk that use the facility [para 4.18].
- 6.11 The definition of average mean tide contained in Section 32 of the Coastal Zone Management Act should be corrected to ensure that private property reflect the water line that occurs at the high tide between at the spring tide and the neap tide. The definition should be changed to read:
- 6.12 “The measurement of the high water mark shall be made at the time of any ordinary high tide occurring on the third or fourth day before or after the day of a full moon” [para 4.41].
- 6.13 Currently, HWM measurements are valid for a period of two years. Taking into account the fact that the time required for preliminary project design, final project design, approval, procurement and construction may exceed two years, consideration should be given to extending the period of the HWM to five years [para 4.42].
- 6.14 The clause of the Integrated Coastal Management Plans regarding setback policy is being “retroactively” should be corrected to reflect actual policy [para 4.43].

#### **c. Programme Efficiency**

- 6.15 It is desirable to have a Programme Coordinator who is exclusively responsible for management of the programme [para 5.10].
- 6.16 It is desirable for the programme to have a Deputy Coordinator (either an engineer or project manager) who would have the knowledge base and capacity to substitute for the Coordinator in

the case of his or her absence, who would know all the working of project, executes disbursement requests. The Deputy Coordinator would be able to substitute for the Coordinator [para 5.11].

- 6.17 To ensure adequate financial administration of the project, it is necessary to have a financial administrator that is knowledgeable of financial management of projects and familiar with the financial procedures of the IDB and adept at financial projections and accrual-based accounting and skilled in the use of a commercial financial software packages. Adequate financial administration is best ensured by having a dedicated Financial Administrator [para 5.12].
- 6.18 Continuity in the financial administration of Programme is important for good financial management. For future programmes executed by the CZMU (and for all programmes in general), it is recommended that a Financial Administrator -- preferably with experience in the financial management of projects -- be hired to provide dedicated (as opposed to shared with CZMU) services to the Programme. This will be all the more necessary due to the new fiduciary requirements introduced by IDB in 2010. Under the new requirements, disbursements will be made based on financial projections rather than ex-post on the basis of Statements of Expenses and invoices [para 5.48].
- 6.19 To ensure adequate financial management of the project, the financial code of accounts for the Programme should be established as a condition prior to first disbursement of Loan financing. The code of accounts should be included in a Programme Operation Manual and should be agreed upon by the IDB Financial Specialist in Barbados. For adequate financial administration of a programme such as the CIP, it is recommended that the financial administration at the activity level of detail [para 5.49].
- 6.20 For future projects it is recommended that a formal communications management plan be prepared, in tandem with a thorough stakeholder analysis. The stakeholder analysis should: identify all stakeholders; determine all of the requirements, expectations, and interests; and determine their level of influence. The communications management plan would detail how all stakeholders (not just property owners) will be communicated with [para 5.61].
- 6.21 Regarding the Semestral Reports:
- i) Maintain the useful, on-going narrative approach for the description detailing the progress of project execution. It greatly facilitates and understanding of important issues that arose during Programme implementation;
  - ii) To enhance the usefulness of the Semestral Reports, more concise and useful information should be added to permit a quick comparison of planned and actual progress, as well as a comparison of physical and financial progress. It is recommended that a Gantt chart be included that provides a comparison of actual and planned activities. The progress Gantt charts should be prepared in Microsoft Project and the PAU should be provided with training in the effective use of this software including Programme Evaluation and Review Technique (PERT). The level of detail of activities should correspond to the principal project tasks and such as design, approval, stakeholder consultations, right-of-access, land acquisition; construction, completion. Key administrative tasks such as semestral and project completion reports, annual audit, procurement plans. The progress chart should present the planned activities as detailed in an Annual Plan of Operation. Actual progress should be overlaid atop the planned progress to permit a visual and numeric (percentage completed) comparison;

- iii) The semestral reports should also include a summary table, based on the Programme Results Matrix (or Logical Framework), that provides a comparison of planned and actual outcomes and outputs;
  - iv) A summary financial table should be provided showing the planned and actual financial progress. The financial table should provide a greater level of detail than is contained in the financial table that accompanies the Project Loan Agreement or Project Inception. Typically, the financial table from the Project Loan Agreement provides information at the Programme component and Sub-Component level. In a programme such as the CIP, in order to obtain a good understanding of financial progress, it is necessary to have information at the Project level (e.g. the cost of the Rockley to Coconut Court project and the other coastal infrastructure projects) and activity level (such as the cost of final design, physical models, or individual consultancies) [para 5.68].
- 6.22 The level of detail in the financial tables should be established in the Programme's financial code of accounts, which should form a part of the Programme Implementation Plan that should be prepared at the outset of the Programme and should receive the no-objection of the IDB. It is recommended that the code of accounts used by the Government of Barbados be used for future Programmes. This would require use of a financial software programme. It is recommended that the purchase of the Smartstream project accounting module be considered. This module would facilitate the Programme's financial administration and ensure ease-of-integration with the Smartstream financial administration software used by the Government of Barbados [para 5.69].
- 6.23 The semestral reports should include a summary table, based on the Programme Results Matrix (or Logical Framework), that provides a comparison of planned and actual outcomes and outputs [para 5.70].
- 6.24 The semestral reports should provide information on the total budget and total cost of each project. Thus, for example, the semestral report should provide information on the total cost of the Rockley to Coconut Court project [para 5.71]
- 6.25 Regarding the annual maintenance and monitoring reports: The requirement that CZMU report annual on marine water quality and marine communities for the Welches Beach project and the Rockley to Coconut Court project should be rescinded. The AMMR should continue to report on the beach profile, but the series of graphs that are presented should be accompanied by a brief technical analysis that would summarize the findings regarding beach stability [para 5.74].
- 6.26 Regarding the audited annual financial statements: For future programmes it is recommended that audited financial statements be required on an annual basis, regardless of whether IDB financing is involved in a given year [para 5.83]; To help ensure transparency, for future programmes, the firm that performs the external audit of the Programme Administration Unit must be separate and distinct from the firm that prepares the financial statements of the PAU [para 5.85]; and the Loan Agreement should stipulate that the final financial report is due within 120 days of the final disbursement date of the Programme [para 5.86].
- 6.27 For the preparation of new investment programmes, it is recommended that all coastal infrastructure projects be subject to cost/benefit analysis. It is important that all of the investments and recurring costs associated with the project be included (including design, construction, supervision and maintenance). The results of the cost benefit analysis should be included as one of the criteria for the prioritization of projects [para 5.116].

- 6.28 Cost/benefit analysis should be written with policy-makers in mind. The economic analysis must be based on sound logic and conservative, realistic assumptions. If econometric models are used to make the economic argument, then any weakness in the econometric results should be explained in layman terms [para 5.117].
- 6.29 It is recommended that CZMU prepare a procedural guide to the cost benefit analysis of coastal infrastructure projects. The procedure guide should be based on real-life projects [para 5.118].

**b. Lessons Learned**

- 6.30 A strong execution agency is critical to Programme success;
- 6.31 Strong technical support for design and supervision is critical;
- 6.32 Investment programmes should be based on final designs. Alternatively, a Programme should include two phases: a design phase and a construction phase, which financing for the second phase tied to the benchmarks of completion of final design, planning approval; legally-documented access to work sites, land acquisition (where required);
- 6.33 Timelines for project execution need to consider all factors that affect implementation (approval, access, acquisition, procurement);
- 6.34 Thorough public consultation, including one-on-one meetings with property owners that are directly affected, are essential to ensure that coastal infrastructure project designs take stakeholder concerns into account to the greatest extent possible without compromising the essential technical objectives of the projects; and also to get stakeholder buy-in and communicate the impacts of the project during construction and post-construction;
- 6.35 The planned timelines for project execution should consider specific actions which are not within the control of CZMU/PCIU (coordination with other government entities, necessary approvals and permits, access agreements with property owners, taking into account the high rate of turn-over in coastal property; agreements with business regarding construction schedules);
- 6.36 A coordination mechanism should be in place during planning and execution of coastal infrastructure projects, involving the main decision makers, such as NCC, Town Planning and SGO, to streamline the several processes required to initiate works;
- 6.37 For adequate financial administration of the Program, a commercial financial software is essential (Excel spreadsheets are inadequate). The responsibility for the Programme's financial administration should be the responsibility of a financial administrator that is dedicated exclusively to handling the Programme accounts and who has either attained or is in the process of attaining a formal accounting designation. A detailed Programme code of accounts is required to enable financial reporting at the project and activity level;
- 6.38 Project planning and project management documents should be prepared, including: Programme Implementation Manual; Annual Plan of Operations; Program Operations Manual.
- 6.39 All indicators used to measure the impacts and results of a Program and its projects must be SMART indicators (Specific, Measurable, Achievable, Relevant, Time-bound). Indicators should be precisely defined. The methodology for collection and timing of the collection should be defined and included in the Program Loan Agreement.
- 6.40 A monitoring program should be formally defined in a document that describes the methodology and responsibility for the data collection required for the identified indicators. Baseline

monitoring information and monitoring activities during implementation should be included in the Loan Agreement.

- 6.41 Program Project Reports should include information necessary to compare planned activities with achieved activities in each time period, permitting a succinct comparison of financial and physical progress.
- 6.42 The incremental cost of shutting down work between the hours of 11:30am and 3:00pm and at 6:00pm to accommodate the concerns of restaurants may be greater than the cost of compensating businesses to close during lunch hour. On future projects, the incremental costs should be compared and, if comparable, consideration could be given to the provision of compensation to affected businesses.
- 6.43 In the construction of coastal infrastructure project, drainage channels that are likely to become clogged with sand should be fitted with fluidizers to avoid build-up of stagnant water in channels.
- 6.44 Under current land tax practices in Barbados, improvements to beaches and coastal infrastructure does not impact the property taxes paid by land owners abounding and abutting the infrastructure projects. Thus, incremental land tax resulting from coastal infrastructure is not, at present, a viable mechanism for partial cost recovery.
- 6.45 The IDB should provide greater support to the Executing Agency to try to find solutions to procurement issues as they arise.
- 6.46 The Project Steering Committee is an effective mechanism to help ensure the transparency of decision-making.

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**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**

**Financial Statements**  
**For The Year Ended**  
**March 31, 2010**

**Brian F. Griffith & Co.**  
**Chartered Accountants**



**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**

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**Independent Auditors' Report  
On  
Statement of Cash Received and Disbursements Made and the Statement of  
Cumulative Investments for the project**

**To the Government of Barbados  
Ministry of Environment, Water Resources and Drainage  
Coastal Infrastructure Programme**

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We have audited the accompanying Statement of Cash Received and Disbursements Made and the Statement of Cumulative Investments for the year ended and as of March 31, 2010, for the Coastal Infrastructure Programme, executed by the **Ministry of Environment, Water Resources and Drainage**, and financed with funds from the Inter-American Development Bank Loan Contract No. 1386/OC-BA and local counterpart funds from the Government of Barbados.

**Ministry of Environment, Water Resources and Drainage's Responsibility for the Financial Statements**

The Ministry of Environment, Water Resources and Drainage through the Coastal Zone Management Unit is responsible for the preparation and fair presentation of these accompanying statements in accordance with International Financial Reporting Standards.

**Auditor's Responsibility**

Our responsibility is to express an opinion on these accompanying statements based on our audit. We conducted our audit in accordance with International Standards on Auditing, issued by the International Federation of Accountants, and the Inter-American Development Bank's requirements, specifically the Bank Policy on the Audit of Projects and Entities and Guidelines for the Preparation of Financial Statements and Independent Audit Requirements. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by the Project Coordinating Unit, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

**Opinion**

In our opinion, the financial statements present fairly, in all material respects, the cash received and disbursements made and the cumulative investments for the project, as of and for the year ended March 31, 2010, in accordance with International Financial Reporting Standards and the terms of IDB Loan Contract No. 1386/OC-BA.

**Brian F. Griffith & Co.**  
**Chartered Accountants**

Bridgetown, Barbados

May 25, 2010

PERMANENT SECRETARY  
MINISTRY OF THE ENVIRONMENT,  
WATER RESOURCES AND DRAINAGE

**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**  
**Statement of Cash Received and Disbursements Made**  
**For the year ended March 31, 2010**  
**(Expressed in US dollars)**

	<u>IDB</u>	<u>LOCAL</u>	<u>TOTAL</u>
	\$	\$	\$
<b>Cash Received</b>			
Balance as of March 31, 2009	8,473,759	17,378,688	25,852,447
Activity during the year			
▪ Reimbursement of Payments	6,811,430	0	6,811,430
▪ Received directly by Contractors	874,811	0	874,811
▪ Contributions by the Government of Barbados	0	928,837	928,837
Total Cash Received as of March 31, 2010	<u>16,160,000</u>	<u>18,307,525</u>	<u>34,467,525</u>
<b>Disbursements Made</b>			
Cumulative balance as of March 31, 2009	8,473,759	17,378,688	25,852,447
Activity during the year			
▪ Expense Reimbursement Request Nos. 12,13,14,15,16,17,18,19,20,21,22,23,26	6,811,430	0	6,811,430
▪ Expenditure on Project Investments	0	928,837	928,837
▪ Direct payments to Contractors	874,811	0	874,811
Total Cash Disbursements as of March 31, 2010	<u>16,160,000</u>	<u>18,307,525</u>	<u>34,467,525</u>
<b>Available Cash Balance</b>			
As of March 31, 2010	<u>0</u>	<u>0</u>	<u>0</u>

The accompanying notes form part of these financial statements



**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**  
**Statement of Cumulative Investments for the Project**  
**As of March 31, 2010**  
**(Expressed in US dollars)**

<u>INVESTMENT CATEGORY</u>	<u>BEGINNING OF THE YEAR</u>			<u>CURRENT YEAR</u>			<u>CUMULATIVE THROUGH MARCH 31, 2010</u>		
	IDB	GOB	TOTAL	IDB	GOB	TOTAL	IDB	GOB	TOTAL
<b>I. Administration &amp; supervision</b>									
1.1 Project administration unit	0	1,307,691	1,307,691	0	290,754	290,754	0	1,598,445	1,598,445
1.2 Engineering design & supervision	0	9,290,927	9,290,927	0	614,856	614,856	0	9,905,783	9,905,783
1.3 Auditing	0	76,504	76,504	0	12,650	12,650	0	89,154	89,154
<b>II. Direct Costs</b>									
2.1 Civil works – Note 9	8,473,759	6,031,521	14,505,280	7,686,241	0	7,686,241	16,160,000	1,282,892	17,442,892
2.2 Institutional strengthening	0	417,737	417,737	0	10,577	10,577	0	428,314	428,314
<b>III. Unallocated Costs</b>									
3.1 Contingencies	0	0	0	0	0	0	0	0	0
3.2 Escalation	0	0	0	0	0	0	0	0	0
<b>IV. Financial Costs</b>									
4.1 Interest	229,247	0	229,247	417,644	0	417,644	646,891	0	646,891
4.2 Credit commission	0	178,464	178,464	0	25,414	25,414	0	203,878	203,878
4.3 Credit inspection & supervision	10,000	0	10,000	0	0	0	10,000	0	10,000
<b>Total</b>	<b>8,713,006</b>	<b>17,302,844</b>	<b>26,015,850</b>	<b>8,103,885</b>	<b>954,251</b>	<b>9,058,136</b>	<b>16,816,891</b>	<b>13,508,466</b>	<b>30,325,357</b>
<b>Percentages</b>	<b>36%</b>	<b>71%</b>	<b>107%</b>	<b>33%</b>	<b>4%</b>	<b>37%</b>	<b>69%</b>	<b>56%</b>	<b>125%</b>

The accompanying notes form part of these financial statements

**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**  
**Notes to financial statements**  
**March 31, 2010**

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**1. Description of project**

On October 9, 2002, the Inter-American Development Bank and the Government of Barbados signed loan agreement No. 1386/OC-BA for US \$17 million to finance the cost of the execution of the Coastal Infrastructure Programme. Actual expenditure on the project commenced in January 2003.

The estimated cost of the Project is US \$24.2 million with contingencies. The Government of Barbados has agreed to finance US \$7.2 million as counterpart funds for the project.

The principal objectives of the project is to assist the Government of Barbados in ensuring a healthy environment and continued economic development of Barbados through improved management and conservation of the coastal zone. The project comprises a range of coastal management works and activities related to four specific objectives:

1. Shoreline stabilization and erosion control.
2. Restoration of coastal habitats.
3. Improvement of public coastal access.
4. Institutional strengthening for coastal management.

**2. Significant accounting policies**

**a) Accounting conventions**

These financial statements are prepared on a cash basis of accounting, recognizing revenue when the cash is received and recognizing expenses when cash is disbursed. This accounting policy is another comprehensive basis of accounting other than International Financial Reporting Standards, under which transactions should be recorded on an accrual basis.

**b) Currency**

These financial statements are expressed in United States dollars and are converted at the rate of US \$1.00 = BDS \$2.00

Transactions denominated in foreign currencies are translated into Barbados dollars and are recorded at the rate of exchange ruling at the date of the transaction.

**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**  
**Notes to financial statements**  
**March 31, 2010**

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**3. Contract amendment**

The Inter-American Development Bank extended the disbursement deadline of the captioned loan at the request of the Government of Barbados, from April 9, 2007 to December 31, 2009.

**4. Available cash balance**

The available cash balance in the Coastal Infrastructure programme's bank account at the Central Bank of Barbados was:

	US \$ 2010	US \$ 2009
Bank account No. 14339U	<u>1,115,483</u>	<u>8,473,759</u>

There were no interest and exchange rate earnings on this account. This cash is to be transferred to the National Treasury Account of the Government of Barbados.

**5. Advances pending justification**

There no advances pending justification as at March 31, 2010.

**6. Revolving fund**

In accordance with loan contract No. 1386/OC-BA a revolving fund equivalent to 5% of the loan was established, up to an amount of US\$850,000. As of March 31, 2010, the balance of the Revolving Fund was US\$0.

**7. Local counterpart funds**

The Government of Barbados committed to contributing a sum of US\$7,200,000. As of March 31, 2010, the government had contributed a sum of US\$13,508,466 which exceeds the amount committed. This is further explained in Note 2 of the notes to Supplementary Financial Information.



**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**  
**Notes to financial statements**  
**March 31, 2010**

**8. Procurement of goods and services**

No goods and services were procured during the year under review.

**9. Reconciliation of Counterpart funding of Investment Category 2.1 "Civil Works"**

	US \$
<b>Contributions from the Government of Barbados</b>	
Period ending March 31, 2005	2,602,647
Period ending March 31, 2006	1,157,058
Period ending March 31, 2007	178,097
Period ending March 31, 2008	4,271,313
Period ending March 31, 2009	4,989,529
Period ending March 31, 2010	3,369,437
	<u>16,568,081</u>
<b>Reimbursed by IBD</b>	
Period ending March 31, 2008	(2,177,594)
Period ending March 31, 2009	(6,296,165)
Period ending March 31, 2010	(6,811,430)
	<u>(15,285,189)</u>
<b>Total Counterpart funding by the Government of Barbados</b>	<u>1,282,892</u>

In the periods ending March 31, 2009 and March 31, 2010, the IBD reimbursed the Government of Barbados US\$6,296,165 and US\$6,811,430 respectively for "Civil Works" expenditure. Of these amounts US\$4,989,529 and US\$3,369,437 respectively, represented "Civil Works" expenditure by the Government of Barbados. The difference of US\$4,748,629 (see Note 10) represents requests for reimbursements for periods prior to the periods ended March 31, 2009.



**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**  
**Notes to financial statements**  
**March 31, 2010**

**10. Adjustment to Government contribution of Investment Category 2.1 "Civil Works"**

	US \$
Cumulative through March 31, 2009	6,031,521
Cumulative through March 31, 2010 – Note 9	<u>1,282,892</u>
<b>Total adjustment to Investment Category 2.1 "Civil Works"</b>	<b><u>(4,748,629)</u></b>

**11. Reconciliation between the Statement of Cash received and Disbursements Made and the Statement of Cumulative Investments for the Project**

	US \$ 2010	US \$ 2009
<b>Cumulative balance as per Statement of Cash Received and Disbursements Made</b>	<b>34,467,525</b>	<b>25,852,447</b>
Cumulative payments made by the Government of Barbados:		
Interest	556,686	139,042
Credit commission	39,775	14,361
Adjustment to Credit inspection and supervision fees	10,000	10,000
Adjustment to 2.1 "Civil Works" – Note 10	(4,748,629)	0
<b>Cumulative balance as per Statement of Cumulative Investments</b>	<b><u>30,325,357</u></b>	<b><u>26,015,850</u></b>

**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**  
**Notes to financial statements**  
**March 31, 2010**

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**12. Reconciliation by Category of Investment of the Programme's Records with the IDB's Records**

	US \$ 2010	US \$ 2009
<b>Balance as per Programme's Records</b>		
2.1 Civil works	16,160,000	8,473,759
4.1 Interest	646,891	229,247
4.3 Credit inspection and supervision	10,000	10,000
Amount pending value date	<u>0</u>	<u>(550,453)</u>
<b>Total</b>	<b>16,816,891</b>	<b>8,162,553</b>
<b>Balance as per IDB records (Disbursed Life)</b>	<b>16,816,891</b>	<b>8,162,553</b>
	<u>                    </u>	<u>                    </u>
<b>Difference</b>	<b><u>0</u></b>	<b><u>0</u></b>



# Brian F. Griffith & Co. CHARTERED ACCOUNTANTS

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## **Independent Auditors' Report On Supplementary Financial Information**

### **To the Government of Barbados Ministry of Environment, Water Resources and Drainage Coastal Infrastructure Programme**

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We have audited the Statement of Cash Received and Disbursements Made for the year ended March 31, 2010, and the Statement of Cumulative Investments as of March 31, 2010, for the Coastal Infrastructure Programme, entered into by the Government of Barbados and the Inter-American Development Bank, executed by the **Ministry of Environment, Water Resources and Drainage**, and have issued our report thereon dated May 25, 2010.

We conducted our audit for the purpose of expressing an opinion on the Statement of Cash Received and Disbursements Made and the Statement of Cumulative Investments of the Project, taken as a whole. The accompanying supplementary financial information is presented for the purpose of additional analysis and should not be considered necessary to the presentation of the basic financial statements. This information has been subjected to the audit procedures applied to the basic financial statements.

We conducted our audit in accordance with International Standards on Auditing, issued by the International Federation of Accountants, and the Inter-American Development Bank's requirements, specifically the Bank Policy on the Audit of Projects and Entities and Guidelines for the Preparation of Financial Statements and Independent Audit Requirements. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance whether the financial statements are free from material misstatements.

#### **Opinion**

In our opinion, the supplementary financial information is presented fairly, in all material respects, when taken as a whole with the basic financial statements.

**Brian F. Griffith & Co.  
Chartered Accountants**

Bridgetown, Barbados

May 25, 2010

**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**  
**Contents of the Supplementary Financial Information**  
**Estimated cost and Cumulative Investments of the Project**  
**For the year ended March 31, 2010**  
**(Expressed in US dollars)**

<u>INVESTMENT CATEGORY</u>	<u>ESTIMATED COST OF PROJECT</u>			<u>CUMULATIVE</u> <u>INVESTMENTS AS AT MARCH 31, 2010</u>			<u>BALANCE AVAILABLE</u>		
	IDB	GOB	TOTAL	IDB	GOB	TOTAL	IDB	GOB	TOTAL
<b>I. Administration &amp; supervision</b>									
1.1 Project administration unit	0	633,000	633,000	0	1,598,445	1,598,445	0	(965,445)	(965,445)
1.2 Engineering design & supervision	0	1,500,000	1,500,000	0	9,905,783	9,905,783	0	(8,405,783)	(8,405,783)
1.3 Auditing	0	200,000	200,000	0	89,154	89,154	0	110,846	110,846
<b>II. Direct Costs</b>									
2.1 Civil works	16,160,000	2,700,000	18,860,000	16,160,000	1,282,892	17,442,892	0	1,417,108	1,417,108
2.2 Institutional strengthening	0	200,000	200,000	0	428,314	428,314	0	(228,314)	(228,314)
<b>III. Unallocated Costs</b>									
3.1 Contingencies	0	1,000,000	1,000,000	0	0	0	0	1,000,000	1,000,000
3.2 Escalation	0	837,000	837,000	0	0	0	0	837,000	837,000
<b>IV. Financial Costs</b>									
4.1 Interest	830,000	0	830,000	646,891	0	646,891	183,109	0	183,109
4.2 Credit commission	0	130,000	130,000	0	203,878	203,878	0	(73,878)	(73,878)
4.3 Credit inspection & supervision	10,000	0	10,000	10,000	0	10,000	0	0	0
<b>Total</b>	<b>17,000,000</b>	<b>7,200,000</b>	<b>24,200,000</b>	<b>16,816,891</b>	<b>13,508,466</b>	<b>30,325,357</b>	<b>183,109</b>	<b>(6,308,466)</b>	<b>(6,125,357)</b>



**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**  
**Notes to Supplementary Financial Information**  
**March 31, 2010**  
**(Expressed in US dollars)**

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**1. Loan modifications**

On September 4, 2009 the Government of Barbados requested the transfer of US\$100,000 from Investment Category 2.2 “Institutional Strengthening” and US\$1,000,000 from Investment Category 3.1 “Contingencies” to Investment Category 2.1 “Civil Works”.

The justification for the transfer of US\$100,000 is that these funds would no longer have been necessary under the Investment Category called Institutional Strengthening and would have been needed to carry out civil works.

The justification for the transfer of US\$1,000,000 was for additional civil works undertaken by the Government of Barbados for the Rockley to Coconut Court project.

IDB also recommended that US\$1,000,000 be transferred from Investment Category 4.1 “Interest” to Investment Category 2.1 “Civil Works”. The final disbursement date was December 2009 and therefore it was unlikely that the majority of the undisbursed amount on the interest would have been used by this time. This approach was deemed critical in an effort to reduce the amount of Loan to be cancelled.

The Investment Category 4.3 “Credit inspection & Supervision” was no longer a policy stipulated by IDB and its balance of US\$160,000 was transferred to Investment Category 2.1 “Civil Works.”

Consequently a total of US\$2,260,000 was transferred to Investment Category 2.1 “Civil Works” for the period ending March 31, 2010.

**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**  
**Notes to Supplementary Financial Information**  
**March 31, 2010**  
**(Expressed in US dollars)**

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**2. Comparison of the estimated project investment costs and the actual costs of the investments made**

With reference to Note 7 in the notes to financial statements and Page 11, comparing the estimated project investment costs and the actual costs of the investments made, it can be seen that the Government of Barbados exceeded its commitment in the categories of Project Administration Unit, Engineering Design and Supervision, Institutional Strengthening and Credit Commission. The main reasons are as follows;

- a) The Consultants had to undertake additional design work and studies for the project.
  - This additional design work occurred primarily in response to changes in the design and scope of the projects and suggestions and concerns raised by stakeholders who would have been affected by the projects.
  - The additional studies for the projects were undertaken to inform the additional design work as outlined above. In the case of the Holetown Lagoon Water Quality Improvement Project an entirely new design was conceptualized which departed greatly from the original design. This required entirely new studies which were reviewed by the Project Steering Committee, IDB and the Quality Assurance/Quality Control Consultants and approved by the Government of Barbados.
- b) The programme was extended for two (2) years.
  - These delays were as a result of land acquisition and contract drafting issues. The extension, approved by the Inter-American Development Bank, resulted in additional fees being paid to the Consultants and salaries paid to the Project Administration Unit Staff.

**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**  
**Notes to Supplementary Financial Information**  
**March 31, 2010**  
**(Expressed in US dollars)**

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**2. Comparison of the estimated project investment costs and the actual costs of the investments made (cont'd)**

c) Consultants recommended to the Government of Barbados that they should purchase the sand and stone for the projects prior to construction. The reasons for this are outlined below:

- This would have saved construction time as the material would already be stockpiled and would only have to be transported to site.
- The Government would then have complete control over the quality control process thereby ensuring that the material procured would be suitable for the purpose.
- There was a unique opportunity to procure armour stone of a substantially higher quality from overseas as well as sand that was, at the time, dredged from the Barbados Port Authority.



**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**  
**Notes to the Supplementary Financial Information**  
**(Expressed in US dollars)**

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**3. Reconciliation between the Project's records and the Bank's records of amounts owed to the Inter-American Development Bank.**

	US \$
Balance of loan outstanding as at March 31, 2010 as per IDB records	16,081,171
Balance of loan payable as at March 31, 2010 as per the Project's records	<u>15,085,593</u>
<b>Difference</b>	<b><u>995,578</u></b>

This difference was as a result of the Government of Barbados not recording those payments made directly to Contractors by IDB as at March 31, 2010. These payments totaled US\$874,812 and the difference was the interest accrued on those payments.

**4. Assets**

There were no assets acquired for the period ended March 31, 2010.





## **Brian F. Griffith & Co. CHARTERED ACCOUNTANTS**

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### **Independent Auditors' Report On Compliance with Financial and Accounting Contractual Clauses**

### **To the Government of Barbados Ministry of Environment, Water Resources and Drainage Coastal Infrastructure Programme**

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We have audited the Statement of Cash Received and Disbursements Made for the year ended March 31, 2010 and the Statement of Cumulative Investments as of March 31, 2010, for the Coastal Infrastructure Programme, entered into by the Government of Barbados and the Inter-American Development Bank, executed by the **Ministry of Environment, Water Resources and Drainage**, and have issued our report thereon dated May 25, 2010.

In relation to our audit, we determined compliance with the financial and accounting contractual clauses and articles within the Special Conditions and General Conditions of Loan Contract No. 1386/OC-BA, as of March 31, 2010. We examined the Special Conditions described in Chapter I to Chapter VII and the General Conditions described in Chapter I to Chapter IX.

We conducted our audit in accordance with International Standards on Auditing and the requirements of the Inter-American Development Bank. Those standards require that we plan and perform the audit to obtain reasonable assurance that the Government of Barbados and the Ministry of Environment, Water Resources and Drainage, through the Coastal Zone Management Unit have complied with the pertinent loan contractual clauses, and applicable laws and regulations. The audit also includes examining, on a test basis, the appropriate evidence obtained. We believe that our audit provides a reasonable basis for our opinion.

#### **Opinion**

In our opinion, the Government of Barbados and the Ministry of Environment, Water Resources and Drainage, through the Coastal Zone Management Unit have complied, in all material respects, with the financial and accounting contractual clauses of the Loan Contract for the Coastal Infrastructure Programme as at March 31, 2010.

**Brian F. Griffith & Co.  
Chartered Accountants**

Bridgetown, Barbados

May 25, 2010

**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**  
**Loan No. 1386/OC-BA**  
**Contents of the financial and accounting contractual clauses and the status of compliance**  
**As at March 31, 2010**

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Contractual clauses applicable only during the project execution period.

**a) The following contractual clauses of the Special Conditions of loan agreement No. 1386/OC- BA were complied with as at March 31, 2010.**

- 2.02 - Interest
- 2.04 - Credit fee
- 3.01 - Currencies of disbursement and use of funds
- 3.02 - Special conditions prior to first disbursement
- 3.03 - Reimbursement of expenditures chargeable to the financing
- 3.04 - Disbursement Period
- 4.01 - Conditions concerning prices and acquisitions
- 4.02 - Maintenance of works
- 4.03 - Reimbursement of expenses chargeable to local contribution
- 4.04 - Contracting of consultants, professionals or experts
- 4.05 - Final Evaluation Report
- 5.01 - Records, inspections, and reports
- 5.02 - Audits
- 6.04 - Communications

**b) The following contractual clauses of the General Conditions of the loan agreement No. 1386/OC-BA were complied with as at March 31, 2010.**

- 3.02 - Credit fee
- 3.03 - Computation of Interest and Credit Fee
- 3.04 - Interest
- 4.01 - Conditions precedent to first disbursement
- 4.02 - Period for fulfilling the conditions precedent to first disbursement
- 4.03 - Requisites for all disbursements
- 4.05 - Charges for the inspection and supervision fee
- 4.06 - Disbursement procedures
- 4.07 - Revolving fund
- 6.01 - General provisions for the execution of the project
- 6.02 - Prices and public tender
- 6.03 - Use of goods
- 6.04 - Additional resources
- 7.01 - Internal control and records
- 7.03 - Reports and financial statements

**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**

**Loan No. 1386/OC-BA**

**Contents of the financial and accounting contractual clauses and the status of compliance (continued)**

**As at March 31, 2010**

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**c) The following contractual clauses of the Special Conditions were not applicable as at March 31, 2010.**

- 2.01 - Amortization
- 2.03 - Resources for General Inspection and Supervision
- 6.01 - Entry into effect
- 6.02 - Termination
- 7.01 - Commitment to Arbitrate

**d) The following contractual clauses of the General Conditions were not applicable as at March 31, 2010.**

- 4.04 - Disbursements for technical cooperation
- 4.08 - Availability of local currency
- 5.01 - Suspension of disbursements
- 5.02 - Termination, accelerated maturity, or partial cancellation of undisbursed balances
- 5.03 - Obligations not affected
- 5.04 - Non-waiver of rights
- 5.05 - Provisions not affected
- 8.01 - Commitment on encumbrances
- 8.02 - Tax exemption
- 9.01 - Composition of the Tribunal
- 9.02 - Initiation of the Procedure
- 9.03 - Convening of the Tribunal
- 9.04 - Procedure
- 9.05 - Costs
- 9.06 - Notification





**Independent Auditors' Report**  
**On**  
**The validity and eligibility of the disbursement requests process**

**To the Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Programme**

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We have audited the Statement of Cash Received and Disbursements Made for the year ended March 31, 2010 and the Statement of Cumulative Investments as of March 31, 2010, for the Coastal Infrastructure Programme, entered into by the Government of Barbados and the Inter-American Development Bank, executed by the **Ministry of Environment, Water Resources and Drainage**, and have issued our report thereon dated May 25, 2010.

In relation to our audit, we examined the disbursement request processes, performed by the Executing Agency for the year ended March 31, 2010. Our audit included verifying the reasonableness of such and the validity and eligibility of the expenditures submitted by means of the disbursement justifications for that period.

We conducted our audit in accordance with International Standards on Auditing, issued by the International Federation of Accountants, and the Inter-American Development Bank's requirements, specifically the Bank Policy on the Audit of Projects and Entities and Guidelines for the Preparation of Financial Statements and Independent Audit Requirements. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance whether the executing agency has complied with the provisions of Loan Contract No. 1386/OC-BA. The audit also included examining, on a test basis, evidence the amounts and disclosures in the disbursement requests submitted and that form a part of the Statement of Cash Received and Disbursements Made and the Statement of Cumulative Investments for the period examined.

**Opinion**

In our opinion, the documentation supporting the expenditures made that correspond to the disbursement requests for the period under examination were fairly presented and represented valid and eligible expenses to the Programme.

**Brian F. Griffith & Co.**  
**Chartered Accountants**

Bridgetown, Barbados

May 25, 2010



**Independent Auditors' Report**

**On**

**The system of internal control**

**To the Government of Barbados**

**Ministry of Environment, Water Resources and Drainage**

**Coastal Infrastructure Programme**

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We have audited the Statement of Cash Received and Disbursements Made for the year ended March 31, 2010 and the Statement of Cumulative Investments as of March 31, 2010, for the Coastal Infrastructure Programme, entered into by the Government of Barbados and the Inter-American Development Bank, executed by the **Ministry of Environment, Water Resources and Drainage**, and have issued our report thereon dated May 25, 2010.

We conducted our audit in accordance with International Standards on Auditing, issued by the International Federation of Accountants, and the Inter-American Development Bank's requirements, specifically the Bank Policy on the Audit of Projects and Entities and Guidelines for the Preparation of Financial Statements and Independent Audit Requirements. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance whether the programme's financial statements are free from material misstatements.

Ministry of Environment, Water Resources and Drainage through the Coastal Zone Management Unit is responsible for establishing and maintaining a system of internal control. In fulfilling this responsibility, estimates and judgments by management are required to access the expected benefits and related costs of internal control system policies and procedures. The objectives of a system of internal control are to provide management with reasonable, but not absolute, assurance that assets are safeguarded against loss from unauthorized use or disposition; transactions are executed in accordance with management's authorization and in accordance with the terms of the contract; and transactions are recorded properly to permit the preparation of the Statement of Cash Received and Disbursements Made and the Statement of Cumulative Investments, in conformity with the basis of accounting described in Note 2 to the financial statements. Because of inherent limitations in any system of internal control, errors or irregularities may nevertheless occur and not be detected. Also, projection of any evaluation of the structure to future periods is subject to the risk that procedures may become inadequate because of the changes in conditions or that the effectiveness of the design and operation of policies and procedures may deteriorate.

In planning and performing our audit of the financial statements for the year ended March 31, 2010, we obtained an understanding of the system of internal control. With respect to the system of internal control, we obtained an understanding of the design of the relevant policies and procedures and whether they have been placed in operation, and we assessed control risk in order to determine our auditing procedures for the purpose of expressing our opinion on the programme's financial statements and not to provide an opinion on the system of internal control. Accordingly, we do not express such an opinion.

In our consideration of the system of internal control of Ministry of Environment, Water Resources and Drainage through the Coastal Zone Management Unit and its operation, we noted no matters that we consider to be material weaknesses.

**Brian F. Griffith & Co.**  
**Chartered Accountants**

Bridgetown, Barbados

May 25, 2010



**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Program**  
**Loan No. 1386/OC-BA**  
**Disclosure of audit procedures utilized**  
**March 31, 2010**

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**Introduction**

As set forth in the first paragraph of our reports on the Statement of Cash Received and Disbursements Made and the Statement of Cumulative Investments for the project, our examination of the financial statements of the Ministry of Environment, Water Resources and Drainage, and the Coastal Zone Management Unit on the Coastal Infrastructure Program was made in accordance with International Standards on Auditing and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. Submitted below are brief comments with respect to the application of certain of these tests and procedures.

The scope of the work undertaken included tests to ascertain:-

- a) Whether tenders were received from suppliers.
- b) Whether purchase orders were prepared and recorded in the system.
- c) Whether purchase orders were approved by a senior officer.
- d) Whether goods or services received were checked to the relevant invoices and purchase orders, and whether, different individuals were involved in the process.
- e) Whether payment could be initiated before payment requests were cross-referenced to purchase orders.
- f) Whether contracts were in place for consultants, professionals or experts who performed services for the Ministry of Environment, Water Resources and Drainage, and the Coastal Zone Management Unit.
- g) Whether adequate supporting documentation was available to substantiate the expenditures.

We verified the figures from the Smart Stream accounting system and:-

- 1) Tested 100% expenditure against documentary evidence such as receipts, purchase orders, invoices and payment request forms.
- 2) Traced amounts from payment request forms to the Smart Stream accounting system.
- 3) Verified the correctness of the allocation of expenditure to the various heads.
- 4) Verified that the expenditures were related to the project.



**Government of Barbados**  
**Ministry of Environment, Water Resources and Drainage**  
**Coastal Infrastructure Program**  
**Loan No. 1386/OC-BA**  
**Disclosure of audit procedures utilized continued**  
**March 31, 2010**

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In evaluating the system of internal control we considered:-

- 1) The control environment.
- 2) Risk assessment.
- 3) The accounting and information systems.
- 4) Control activities.
- 5) Monitoring activities.



**Brian F. Griffith & Co.** CHARTERED ACCOUNTANTS

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May 25, 2010

Ministry of Environment, Water Resources and Drainage  
C/o The Project Manager  
Coastal Zone Management Unit  
Bay Street  
St. Michael

Dear Sirs,

**Re: Loan No. 1386/OC-BA Coastal Infrastructure Programme**  
**Audit for the year ended March 31, 2010**

In accordance with normal practice, we now submit our management letter as a result of our review of the accounting system and procedures followed by the Ministry of Environment, Water Resources and Drainage through the Coastal Zone Management Unit during our recent audit for the year ended March 31, 2010.

We are pleased to report that your accounting system and your system of internal control fulfilled our audit requirements of the lending agency.

We wish to express our appreciation of the assistance given to us by your staff during the course of the audit.

**Brian F. Griffith & Co.**  
**Chartered Accountants**