

Document of
The World Bank

Report No: ICR2362

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(TF-56744)

ON A GRANT

IN THE AMOUNT OF US\$ 2.1 MILLION

TO

THE COMMONWEALTH OF DOMINICA, ST. LUCIA, AND ST. VINCENT AND
THE GRENADINES

THROUGH THE

CARIBBEAN COMMUNITY CLIMATE CHANGE CENTRE
(CCCCC)

FOR

THE IMPLEMENTATION OF ADAPTATION MEASURES IN COASTAL ZONES PROJECT

June 21, 2012

Sustainable Development Department
Caribbean Country Management Unit
Latin American and Caribbean Region

CURRENCY EQUIVALENTS
 (Exchange Rate Effective April 30, 2012)
 Currency Unit = East Caribbean Dollar
 EC\$ 1.00 = US\$ 0.37
 US\$ 1.00 = EC\$ 2.7

ABBREVIATIONS AND ACRONYMS

AICTU	Agriculture Information, Communication and Technology Unit
CARIB-HYCOS	Caribbean Hydrological Cycle Observing System
CARICOM	The Caribbean Community
CBD	Convention on Biological Diversity
CC	Climate change
CCBRAS	Coconut Bay Resort
CCCCC	Caribbean Community Climate Change Centre
CPACC	Caribbean Planning for Adaptation to Climate Change
CWSA	Central Water and Sewage Authority
GEF	Global Environment Facility
GEO	Global Environment Objective
ICR	Implementation Completion and Results Report
ISR	Implementation Status Report
IUCN	International Union for Conservation of Nature
IUFRs	Integrated Unaudited Financial Reports
MACC	Mainstreaming Adaptation to Climate Change in the Caribbean
MDNP	Morne Diablotin National Park
MEA	Multilateral environmental agreements
MRI	Meteorological Research Institute of Japan
MTPNP	Morne Trois Pitons National Park
MTR	Mid-term review
NBSAP	National Biodiversity Strategy and Action Plan
OECS	Organization of Eastern Caribbean States
OPAAL	OECS Protected Areas and Associated Livelihoods
PAD	Project Appraisal Document
PCs	Participating Countries
PDO	Project Development Objective
PPCR	Pilot Project on Climate Resilience
SVG	Saint Vincent and the Grenadines
SIDS	Small Island Developing States
SPACC	Special Program for Adaptation to Climate Change
UNCCD	United Nations Convention to combat desertification and drought
UNFCCC	United Nations Framework Convention on Climate Change
VINLEC	Saint Vincent national electric authority
WB	The World Bank

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**THE COMMONWEALTH OF DOMINICA, ST. LUCIA, AND ST. VINCENT AND
THE GRENADINES**

Implementation of Adaptation Measures in Coastal Zones Project

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A. Basic Information			
Country:	Regional: The Commonwealth of Dominica, Saint Lucia, Saint Vincent and the Grenadines.	Project Name:	CARIB-GEF-Implementation of Adaptation Measures in Coastal Zones
Project ID:	P090731	L/C/TF Number(s):	TF-56744
ICR Date:	06/12/2012	ICR Type:	Core ICR
Lending Instrument:	GRANT	Borrower:	Caribbean Community Climate Change Centre (CCCCC)
Original Total Commitment:	USD 2.10M	Disbursed Amount:	USD 2.03M
Revised Amount:	USD 2.10M		
Environmental Category: B		Global Focal Area: C	
Implementing Agencies: Caribbean Community Climate Change Centre			
Cofinanciers and Other External Partners:			

B. Key Dates				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	09/13/2005	Effectiveness:		02/01/2007
Appraisal:	03/15/2006	Restructuring(s):		10/14/2010
Approval:	09/07/2006	Mid-term Review:		09/14/2010
		Closing:	06/30/2011	12/31/2011

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes:	Moderately Satisfactory
Risk to Global Environment Outcome	Moderate
Bank Performance:	Moderately Satisfactory
Borrower Performance:	Moderately Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance			
Bank	Ratings	Borrower	Ratings
Quality at Entry:	Moderately Satisfactory	Government:	Moderately Satisfactory
Quality of Supervision:	Moderately Satisfactory	Implementing Agency/Agencies:	Moderately Satisfactory
Overall Bank Performance:	Moderately Satisfactory	Overall Borrower Performance:	Moderately Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	Yes	Quality of Supervision (QSA):	None
GEO rating before Closing/Inactive status	Moderately Satisfactory		

D. Sector and Theme Codes		
	Original	Actual
Sector Code (as % of total Bank financing)		
Central government administration	58	58
Flood protection	8	0
General agriculture, fishing and forestry sector	14	14
General water, sanitation and flood protection sector	12	12
Water supply	8	16

Theme Code (as % of total Bank financing)		
Biodiversity	29	29
Climate change	29	29
Environmental policies and institutions	14	14
Land administration and management	14	14
Water resource management	14	14

E. Bank Staff		
Positions	At ICR	At Approval
Vice President:	Hasan A. Tuluy	Pamela Cox
Country Director:	Francoise Clottes	Caroline D. Anstey
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F. Results Framework Analysis

Project Development Objective (PDO), Global Environment Objective (GEO) and Key Indicators (as approved)

The Project Appraisal Document detailed both a Project Development Objective (PDO) and a Global Environment Objective (GEO), although most of the references and indicators refer to the PDO.

The PDO was to support efforts by Dominica, Saint Lucia and St. Vincent and the Grenadines to implement specific (integrated) pilot adaptation measures addressing primarily, the impacts of climate change on their natural resources base, focused on biodiversity and land degradation along coastal and near-coastal areas. They were achieved through: (i) the detailed design of pilot adaptation measures to reduce expected negative impacts of climate change on biodiversity and land degradation; and (ii) the implementation of pilot adaptation investments. Reducing these impacts would primarily result in protection of biodiversity and prevention of land degradation but would also induce economic benefits in the tourism, fisheries, agriculture and forestry sectors. It would also help maintain the resource base upon which these economic activities rely, promoting a climate resilient sustainable development.

The Global Environment Objective was to produce knowledge that would be of global value on how to implement adaptation measures in small island states, which could be applicable to other countries in the region, and in the world, even if they were not participating in the project.

Revised PDO, GEO (as approved by original approving authority) and Key Indicators and reasons/justifications

Neither the PDO nor the GEO were modified after the restructuring of the Project, which took place in September 2010. However, the key indicators were revised in order to establish a better link with Project objectives. As a result, the number of indicators increased from the original eight to 15 after project restructuring. This review managed to frame the expected achievements in a clearer and more organized way, and proved to be beneficial for Project management.

(a) Revised PDO Indicator(s)

The table below shows the revised PDO indicators and the level to which they were achieved..

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	Dominica. At least one Park Management Plan for Morne Diablotin National Park (MDNP) and /or Morne Trois Pitons National Park (MTPNP) updated with climate change issues and submitted to Cabinet after review by the Secretary of Agriculture.			
Value (quantitative or qualitative)	Existing Management Plans dated MTPNP/2002–2012 prepared in 2001; MDNP/1993–2003 dated 1993 (no climate	Consultancy report on the incorporation of impact of climate change in national parks management	Adaptation measures to lessen anthropogenic pressure on park lands identified	The Park Management Plan for MTPNP has been extensively reviewed & for MDNP has been

	change considerations).	plans under consideration of CCCCC before public consultation	and incorporated in park management documents	updated and climate change issues added. Both are under review of the Permanent Secretary of Agriculture prior to submission to the Cabinet for approval.
Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	100% Achieved			
Indicator 2:	Dominica. The Ministry of Agriculture creates and maintains a comprehensive database of key ecological variables useful for Park Management			
Value (quantitative or qualitative)	No systematic information on ecological variables available	Collection of field data completed, and delivered to government officials.	Database compiled and available for the ministry of agriculture and the forestry division	The Ministry of Agriculture & Forestry has prepared a comprehensive database and delivered to the Agriculture Information, Communication and Technology Unit (AICTU).
Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	100% Achieved			
Indicator 3:	Dominica. The Ministry of Agriculture and Forestry installs at least one new meteorological station in each of the two Parks and uses information from them for National Park management and/or agriculture planning			
Value (quantitative or qualitative)	No meteorological data stations available inside the parks	Report prepared by the Caribbean Institute of Meteorology and Hydrology has been reviewed by the Bank and submitted to consultant for completion. Acquisition of appropriate meteorological stations are underway	One station in each park has been installed, and the Ministry of Agriculture and Forestry division have online access to the data generated	The two meteorological stations have been purchased and installed, as part of the ongoing CARIB-HYCOS Project covering the Islands States, and information is being collected and used by Forestry Department and the National Meteorological

				Service.
Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	100% Achieved			
Indicator 4:	Dominica. The Ministry of Agriculture gains capacity to manage water stresses related to climate change through extrapolating useful lessons from an irrigation pilot for the communities of Colihaut, Dublanc and Bioche			
Value (quantitative or qualitative)	Non-irrigated agricultural land highly vulnerable to water scarcity issues. No irrigation project led by Government has been developed in Dominica	In Dominica consultancies are under implementation. Design report and bidding docs for the pilot in Milton State (drip irrigation system) has been submitted to the Bank for review	Irrigation pilot designed and implemented in the Milton area. Ministry of agriculture has supported the design and implementation, and coordinates the execution and dialogue with farmers.	The Ministry of Agriculture has developed a pioneer irrigation pilot in the Milton area. During its implementation workshops and meetings were held with beneficiaries, private sector and other stakeholders.
Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	100% Achieved			
Indicator 5:	St. Lucia. Results from the implementation of Vieux Fort rainwater harvesting and waste water treatment pilot documented & disseminated by the Planning Ministry through a TN and a workshop for government, private sector and non-profit stakeholders			
Value (quantitative or qualitative)	No rain water harvesting experiences on large infrastructure documented and disseminated	Lessons learnt during implementation of the pilot have been used and construction guidelines are being imposed upon all touristic resources on the island. Further technical codes for standard constructions are being considered for enforcement purposes	Works for rainwater harvesting and wastewater treatment finalized, certificates of completion available, information about costs and benefits collected. Technical note prepared and dissemination of lessons learned initiated	The rainwater harvesting experience has yielded many positive experiences, which have been captured in relevant documents by the Ministry of Physical Planning & Environment.
Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011

Comments (incl. % achievement)	100% Achieved			
Indicator 6:	St. Lucia. Vieux Fort rain water harvesting system reduces the consumption of 3,000 cubic meters per year of potable water from the water utility.			
Value (quantitative or qualitative)	Water is being diverted for water supply to a growing population, without water conservation measures. No significant rain harvesting in the area	Contract awarded and works under implementation.	Rain harvesting structures provide at least 3,000 cubic meters of water for the pools and bathrooms of the hotel	Rain harvesting and recycling system successfully finalized. 18,000 & 27,000 liter tanks have been installed with a total capacity of 45m3. These tanks are used daily by the hotel, reducing the consumption from water utility
Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	100% Achieved There is not enough data to estimate the actual reduction of consumption as the rainwater storage tanks were installed end 2011.			
Indicator 7:	St. Lucia. The Ministry of Physical Planning and Environment submits for Cabinet approval a decree to enforce rain water harvesting on new touristic activities			
Value (quantitative or qualitative)	No legal framework to enforce rain water harvesting exists	Draft decree being discussed within Government	Rain harvest-enforcing decree has been submitted to Cabinet for approval	The legal framework to enforce rainwater harvesting on new touristic developments has been fully prepared. Its enforcement is awaiting thorough review before the Planning Ministry officially submits the proposal to the Cabinet
Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	Partially achieved. The purpose of the activity, which is preparing the framework for the enforcement of rain water harvesting on new touristic activities, has been fully achieved. The submission to Cabinet has not happened yet.			
Indicator 8:	St. Lucia. Successful Vieux Fort waste water treatment system contributes to reduce organic load to the coastal ecosystems in the Pointe Sable Environmental Protection Area by canceling actual waste water sewerage outflow into the coast			
Value (quantitative or qualitative)	Waste water produced by the hotel undergoes	Waste water system designed, final	Waste water system	All wastewater produced by the

qualitative)	mild treatment and is discharged at the neighboring Point Sable Environmental Protection Area	bidding documents under review	functioning, waste water outlet towards Point Sable Area no longer in use.	hotel is currently being treated in their plant and subsequently being reutilized for garden irrigation, with no outflow to the coast.
Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	100% Achieved			
Indicator 9:	St. Lucia. Information campaign implemented by the Ministry of Physical Planning and Environment to disseminate the lessons of the Marchand building pilot.			
Value (quantitative or qualitative)	Existing building codes and practices.	St. Lucia is already using lessons to be replicated in the island	Retrofitting of one vital infrastructure. Cabinet paper for introduction of the New Engineering Guidelines submitted for consideration by the Government of St. Lucia	The Ministry of Physical Planning and Environment has disseminated the experiences gained with the Marchand building pilot. The Marchand building is commonly being used as a flagship experience.
Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	100% Achieved			
Indicator 10:	SVG. Institutional viability of Bequia water desalination & distribution system is demonstrated by an operative, adequately staffed Central Water & Sewage Authority office for the collection of consumer fees, and operation & maintenance of the system			
Value (quantitative or qualitative)	No water fees being collected in the Paget Farm area, water distribution system non existent	In Bequia the desalination plant has been procured and is currently being installed	Fully operational system, Central Water & Sewage Authority (CWSA) is collecting fees from consumers	The desalination plant is fully operating. CWSA prepared the design of the system and the Government has contributed financially and in kind. CWSA is currently reviewing the financial assessment in order to fix consumer fees for the water produced

Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	100% Achieved			
Indicator 11:	Technical viability of Bequia desalination, water distribution and renewable energy pilot is demonstrated by an operative desalination plant producing 50 m3 per day and an operative renewable energy device producing an average of 10,000 kWh per month			
Value (quantitative or qualitative)	Water availability constrained to individual storage limited during the rainy season only.	Desalination Plant already in final location and currently being installed. Contract for the renewable energy system is awarded	Desalination plant and renewable energy source are fully functional and being operated by the utility companies. Govt. has extracted technical lessons on operation & maintenance of new technology	The desalination plant has been installed at the Bequia Fisheries Complex at Paget Farms community and is producing potable-quality water since July 2011, with output of 60m3/day. Photovoltaic system fully installed in Bequia and producing over 10,000 kWh per month.
Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	100% Achieved			
Indicator 12:	Financial viability of Bequia desalination, water distribution & renewable energy pilot is demonstrated by a financing mechanism including tariffs, budgetary contributions and a renewable energy source to cover maintenance & offset incremental costs			
Value (quantitative or qualitative)	No water desalination for public consumption experience in the island, reduced water connection structures.	The contract for the photovoltaic system to provide renewable energy has been recently signed. The procurement of two storage tanks for SVG is underway	The Govt. has acquired insights on the costs of desalination plus renewable energy combination, CWSA is collecting user fees, the electrical utility (VINLEC) is operating the renewable source and providing the energy required.	The financial viability of Bequia will be covered by user fees. Maintenance costs will be covered from sales of electricity produced by the solar system. However, the water distribution system is not finalized, fees are not yet collected, and the purchase agreement is not concluded

Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	Partially Achieved. An unexpected benefit of the project is the experience gained through the design and definition of this power purchase agreement.			
Indicator 13:	SVG. The Ministry of Health and Environment gains capacity to manage water stresses related to climate change through the extraction of useful lessons from Bequia pilot			
Value (quantitative or qualitative)	No renewable energy source operated by the utilities in the island. Reduced adaptation capacity. Barging of water from the government occurs frequently during dry season.	Pilot project to manage water stresses under implementation	The Ministry of Health has supported the design and implementation process of the pilot, has been provided with economic and technical information, and has a report on recommendations to replicate the pilot. A workshop has taken place.	The MoH has devoted part-time staff on a regular basis for the design & implementation of activities; has a report on investment, operation and maintenance costs. However, the scheme is not yet fully assembled, a workshop and technical note are approaching
Date achieved	06/15/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	Partially Achieved			

(b) Revised GEO Indicator(s)

These are the revised indicators that illustrate the progress achieved towards the GEO.

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 14:	Global Learning Value. Lessons learnt by the CCCCC are disseminated through technical notes.			
Value (quantitative or qualitative)	No experience with adaptation measures.	Draft technical notes are available. Reports about impact of CC have been prepared, and future efforts will be focused on gathering all the experiences during project implementation	At least three technical notes on lessons learned from SPACC disseminated by CCCCC	The CCCCC has prepared notes and posted them on their web site. Experiences gained through SPACC are being used and scaled up through the larger PPCR program.

		and considering the appropriate channels for dissemination.		
Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	100% Achieved			
Indicator 15:	The University of West Indies receives from the Meteorological Research Institute of Japan, useful climate modeling data to enhance its regional climate model and makes use of the results in research and teaching.			
Value (quantitative or qualitative)	No data from MRI available for the university.	Two scientists from University of West Indies trained in Japan have estimated impact of climate change in project area using Earth Simulator data. Dissemination of knowledge and experiences underway	Two professionals from the University of West Indies have been trained in the use of the Earth Simulator model. Results are used for regional research.	The University of West Indies sent two scientists to the MRI in Japan. Both are teachers at the University and useful information and knowledge are being used on a number of initiatives such as additional work towards improvement for CC models
Date achieved	01/26/2007	06/15/2011	12/31/2011	12/31/2011
Comments (incl. % achievement)	100% Achieved			

G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	PDO/GEO	IP	Actual Disbursements (USD millions)
1	05/21/2007	Satisfactory	Satisfactory	0.21
2	12/12/2007	Satisfactory	Satisfactory	0.24
3	06/06/2008	Moderately Satisfactory	Moderately Satisfactory	0.31
4	01/05/2009	Moderately Satisfactory	Moderately Unsatisfactory	0.53
5	06/30/2009	Moderately Satisfactory	Moderately Unsatisfactory	0.58
6	12/22/2009	Moderately Unsatisfactory	Moderately Unsatisfactory	0.64
7	06/20/2010	Moderately Unsatisfactory	Moderately Unsatisfactory	0.67
8	12/05/2010	Moderately Satisfactory	Moderately Satisfactory	0.67
9	06/28/2011	Moderately Satisfactory	Moderately Satisfactory	1.14
10	01/01/2012	Moderately Satisfactory	Moderately Satisfactory	1.87

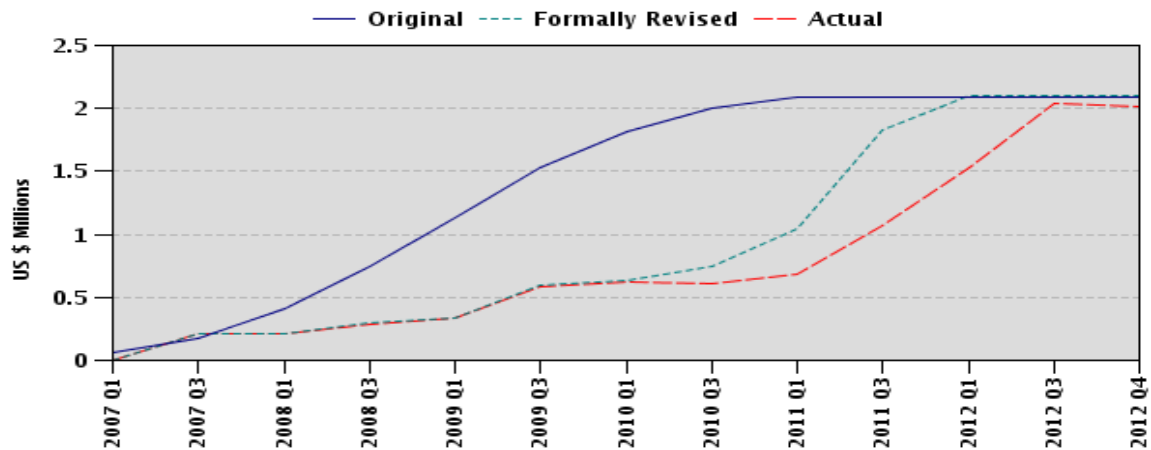
H. Restructuring (if any)

Restructuring Date(s)	Board Approved PDO/GEO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD millions	Reason for Restructuring & Key Changes Made
		PDO/GEO	IP		
10/14/2010	Y	MU	MU	0.67	The reasons were: (i) the Govt. of St. Vincent had decided not to implement two of their three pilots, reducing the total number of pilots from seven to five; (ii) the outcome indicators needed to be adjusted to better reflect the nature of the interventions; (iii) adjustments were needed in disbursement categories to allow for workshops and operating costs; and (iv) the proceeds of the grant had to be reallocated to compensate for the financial constraints that the PCs had suffered

If PDO/GEO and/or Key Outcome Targets were formally revised (approved by the original approving body) enter ratings below:

	Outcome Ratings
Against Original PDO/GEO/Targets	Moderately Unsatisfactory
Against Formally Revised PDO/GEO/Targets	Moderately Satisfactory
Overall (weighted) rating	Moderately Satisfactory

I. Disbursement Profile



Implementation Completion and Results Report for the OECS Implementation of Adaptation Measures in Coastal Zones Project (P090731)

1. Project Context, Global Environment Objectives and Design

1. This Implementation Completion and Results Report (ICR) describes the results of the Regional Implementation of Adaptation Measures in Coastal Zones Project, GEF Grant funded through the Special Program on Adaptation (SPA), approved by the Board in September 2006 and restructured in October 2010. The Global Environment Facility (GEF) Trust Fund grant in the amount of US\$2.1 million became effective on February 1, 2007 and the closing date was June 30, 2011, extended until December 31, 2011. The recipient was the Caribbean Community Climate Change Centre (CCCCC) which is the region's climate change (CC) institution whose mandate is to provide climate change-related policy advice to the Caribbean Community Member States through the Caribbean Community Secretariat. (CARICOM)

2. The Project objective was to support the efforts of Dominica, St. Lucia, and St. Vincent and the Grenadines to implement specific, integrated pilot adaptation measures that primarily address the impacts of CC on their natural resources base, with a focus on biodiversity and land degradation along coastal and near-coastal areas. The three participating countries belong to the Organization of Eastern Caribbean States (OECS), a region characterized by a rich biodiversity endowment, which, in combination with its isolation from other areas, has resulted in relatively high rates of national and regional endemism. The Caribbean has been identified by a survey of the world's biodiversity hotspots as the fifth ranking hotspot and one of the highest priorities in any global strategy for biodiversity conservation and sustainable management¹. The principal ecosystems are dry and humid tropical forests, wetlands and tidal flats, sandy and rocky beaches, coral reefs, sea-grass beds, mangroves, and offshore islets. The reef, sea-grass and mangrove systems of this area are recognized as among the most productive in the world.

3. As this was one of the first CC adaptation projects in the Bank, the design addressed the need of piloting adaptation measures seeking global benefits while acknowledging the structural constraints at the national and regional level. The challenge was to develop a strategy addressing issues of government capacity to address adaptation in three different countries through the empowerment of a regional entity such as CCCCC. During preparation most of the risks were identified and appropriate mitigations were proposed. However, several difficulties appeared in the implementation phase due to weaknesses in the original assessment of project costs. Furthermore, the international financial crisis (2008-2009) undermined the capacity of national governments and other donors to contribute to the implementation, as was originally proposed.

1.1 Context at Appraisal

4. At appraisal, there was evidence that CC was a serious challenge faced by global ecosystems. The emission of greenhouse gases was a matter of concern since scientific understanding indicated that it would increase the earth's mean surface temperature between 1.5 and 5.8 degrees Celsius during the next 100 years². A change of this magnitude would result in significant impacts at a global scale. Along with changes in the mean climatic conditions, the biosphere potentially faced irreversible and catastrophic impacts associated with the reduction of thermo-haline circulation, the subsidence of small islands and

¹ Conservation International, 2003. State of the Hotspots, Washington, D.C.

² Third and Fourth Assessment Reports of the Intergovernmental Panel for Climate Change (2001 and 2007)

increases in the intensity of hurricanes, among others. Overall, these impacts would be especially significant in vulnerable regions such as small island states, and the Caribbean was amongst the most vulnerable regions to these impacts, threatening the planet's biodiversity. A CC adaptation Project was thus pertinent to mitigate these effects as much as possible.

5. Climate Change was also expected to affect the physical and biological characteristics of the Caribbean Sea and its coastal areas, modifying ecosystem structures and its functioning. Moreover, scientific understanding at the time of appraisal indicated that, in near-shore marine and coastal areas, many wetlands and coastal forests would be affected by changes in sea level and storm surges. Mangroves and coastal lagoons were expected to undergo rapid change and perhaps be lost altogether as functioning ecosystems. Low-lying coastal areas and associated wetlands could also be displaced by salt water habitats, disrupting fresh-water based ecosystems. Such changes were likely to result in dislocation of migratory birds and aquatic species, not tolerant to increased salinity or flooding. In addition, climate variability and intensification of hurricanes posed a significant threat to the sustainable development of Small Island Developing States. There has been an increase in the intensity and number of hurricanes in the Caribbean basin since 1970, associated to warmer sea surface temperatures. This has major implications for coastal zones in most countries on the Caribbean Basin, affecting coastal infrastructure and ecosystems and possibly forcing permanent displacement of people from coastal zones.

6. The OECS region was highly dependent on the degree of resilience of the natural resources base that supports the key economic sector and activities (Annex 2 illustrates some of the effects of CC on the natural resources base and how it affected economic activity in the region) to CC impacts, climate variability and land degradation. The participating countries recognized fully that they had no choice but to aggressively pursue an integrated development approach that inter alia could take full account of the predicted and actual impacts of global CC, climate variability, the impacts on biodiversity and land degradation. This recognition was reflected in a number of national policies and strategies, both planned and implemented, including National Climate Change policies; A National Biodiversity Strategy and Action Plan (NBSAP); the National Action Plan for Implementation of the UNCCD; Natural Hazard Mitigation Policy and National Capacity Self Assessments. However, limited financial, human and technical resources within these three participating countries posed a challenge to the effective and full implementation of these strategies.

7. Recognizing the importance of adopting an integrated approach to climate change adaptation, Dominica, Saint Lucia, and St. Vincent and the Grenadines were the first three countries in the region to adopt a comprehensive adaptation framework which gave them the best position amongst Caribbean nations to implement pilot adaptation investments. They had already taken basic decisions toward mainstreaming CC concerns in the development process, by developing national climate change plans, which allowed them to provide valuable and complementary feedback to the efforts already in implementation. The three countries had all ratified the UNFCCC, UNCCD, and CBD, and were active participants.

8. Within this context, the World Bank (WB) had already been involved in the region through a number of operations that helped build momentum on the need to take action against climate change-induced impacts. The Bank's involvement in climate change adaptation in the Caribbean began in 1998, with the GEF CPACC Project (Caribbean Planning for Adaptation to Global Climate Change) (1998-2001). The WB continued its involvement with climate change adaptation work in the region as the Implementing Agency for the GEF-funded "Mainstreaming Adaptation to Climate Change" (MACC) Project (2003-2007) which aimed at supporting the development of an enabling environment for climate change adaptation in CARICOM countries. The WB also had other sources of experience in the area of adaptation planning in Small Island Developing States (SIDS), through the Kiribati Adaptation Project (2005-2008), and the GEF-funded OECS Protected Areas and Associated Livelihoods (OPAAL) Project

(2005-2010), together with a robust agenda on disaster risk management activities in Saint Lucia, from which the SPACC Project would benefit. These benefits included already existing relationships with relevant institutions such as the Ministry of Health, Ministry of Physical Planning, Ministry of Works and the National Emergency Management Office.

1.2 Original Project Development Objectives (PDO), Global Environment Objective (GEO) and Key Indicators (as approved)

9. The Project Development Objective (PDO) was to support efforts by Dominica, Saint Lucia and St. Vincent and the Grenadines to implement specific (integrated) pilot adaptation measures addressing primarily, the impacts of climate change on their natural resources base, focused on biodiversity and land degradation along coastal and near-coastal areas. This would be achieved through: (i) the detailed design of pilot adaptation measures to reduce expected negative impacts of climate change on marine and terrestrial biodiversity and land degradation; and (ii) the implementation of pilot adaptation investments.

10. The Global Environment Objective was to produce knowledge that would be of global value on how to implement adaptation measures in small island states, which could be applicable to other countries in the region, and in the world, even if they were not participating in the project. The value of these early lessons would make the GEF resources applied, more cost-effective in the medium term. The Project complements the goals of the Mainstreaming Adaptation to Climate Change in the Caribbean (MACC) Project and applies the lessons and information gathered through the Caribbean Planning for Adaptation to Climate Change (CPACC) Project by piloting the implementation of adaptation measures in countries that have already taken mainstreaming decisions and seek to execute specific measures to address the impacts of climate change on biodiversity and land degradation.

1.3 Revised PDO and GEO (as approved by original approving authority) and Key Indicators, and reasons/justification

11. Neither the PDO nor the GEO have been modified throughout the duration of the project, and remain valid. The Project was restructured in October 2010 and the main reasons for the restructuring were: First, the Government of Saint Vincent and the Grenadines had decided not to implement two of their three pilots, thus reducing the total number of pilots from the initial seven pilots to five. Second, some indicators needed to be reviewed to better reflect measurable results for which the Project could be held accountable. Third, some adjustments needed to be made in the disbursement categories to allow for the financing of workshops and operating costs. Fourth, the proceeds of the grant had to be reallocated to compensate for the financial constraints that the participant countries had suffered during the financial crisis. After the mid-term review, some of the key indicators were revised to reflect the actual scope of pilot activities, integrated into a revised Results Framework and Monitoring Matrix (Annex 4).

12. The Project was funded by the Special Program for Adaptation of the GEF, and was conceived as beneficial for biodiversity. However, the indicators used before restructuring were overly ambitious, and the enhancement on environmental conditions that would in turn safeguard biodiversity could not be fully achieved by a Project of this nature and size. Moreover, impacts on environmental baselines and changes in biodiversity can only be measured in the long term. The project has promoted better management of anthropogenic activities that generate pressures on the environment (agriculture, wastewater production and others), which in turn yield benefits for global public goods such as biodiversity and ecosystems.

13. The revision of indicators proved to be a very positive decision. The number of indicators was originally eight. With the restructuring fifteen indicators were defined (Table 1). These are more precise than those in the original design of the Project, and they have made a difference to the quality of the Project by better framing its achievements, outcomes, and facilitating monitoring and management.

Table 1. Key Outcome Indicators: Original and Revised

<i>Original</i>	<i>Revised</i>
Indicators linked to PDO	
<p>Dominica:</p> <p>1. Ecosystem functioning in Morne Diablotin and Morne Trois Pitons National Parks is preserved (measured through the stabilization of the population of key flagship species, such as the stabilization of 135 pairs of nesting parrots that are affected by climate change impacts).</p>	<p>1 At least one Park Management Plan (including a land use plan for buffer areas) updated and submitted to Cabinet for approval by the Ministry of Agriculture and Forestry, incorporating climate change considerations for the Morne Diablotin National Park and/or the Morne Trois Pitons National Park in Dominica.</p> <p>2 Ministry of Agriculture and Forestry creates and maintains a comprehensive database of key ecological variables useful for Park Management.</p> <p>3 The Ministry of Agriculture and Forestry installs at least one new meteorological station in each of the two Parks and uses information from them for National Park management and/or agriculture planning.</p> <p>4 The Ministry of Agriculture gains capacity to manage water stresses related to climate change on agriculture through the extraction of useful lessons (evidenced by the publication of at least one technical note and the implementation of at least one workshop for government, private sector, and non-profit stakeholders in Dominica) from an irrigation pilot for the communities of Colihaut, Dublanc and Bioche.</p>
<p>St. Lucia:</p> <p>2. Health of coastal ecosystems in the Vieux Fort area (measured through the stabilization of the area, density and productivity of 60 ha of coastal mangroves in Mankote/ Savannes Bay) that are being affected by climate change and other causes of stress are stabilized.</p> <p>3. Lessons from strengthening of key infrastructure incorporated into local hazard management plan and building guidelines.</p>	<p>5. Results from the implementation of the Vieux Fort rainwater harvesting and waste water treatment pilot documented and disseminated by the Ministry of Physical Planning and Environment through the publication of at least one technical note and the implementation of at least one workshop for government, private sector, and non-profit stakeholders in St Lucia.</p> <p>6. Vieux Fort rain water harvesting system reduces the consumption of 3,000 cubic meters per year of potable water from the water utility.</p> <p>7. The Ministry of Physical Planning and Environment submits for Cabinet approval a decree to enforce rain water harvesting on new commercial touristic activities.</p> <p>8. Successful Vieux Fort waste water treatment system contributes to reduce organic load to the coastal ecosystems in the Pointe Sable Environmental Protection Area (PSEPA) of St. Lucia by cancelling actual waste water sewerage outflow into the coast.</p> <p>9. Information campaign implemented by the Ministry of Physical Planning and Environment to disseminate the lessons of the Marchand building pilot.</p>

<p>St. Vincent and the Grenadines:</p> <p>4. Population of 25 ha of remaining Black Mangrove (<i>Avicennia sp</i>) stands on Union Island (measured through density and productivity) and affected by climate change, is stabilized.</p> <p>5. Bequia Island integrated natural resource management plan, including climate change, biodiversity and land degradation concerns, finalized and incorporated into national development planning process.</p> <p>6. Diversity of coral reefs and associated species (measured by number and density of species) in the Spring Village area, affected by climate change and land degradation impacts, is stabilized. Number and density of coral species has not diminished over the lifetime of the Project.</p>	<p><i>Dropped due to the proposed cancellation of this pilot.</i></p> <p>10. Institutional viability of the Bequia water desalination and distribution system is demonstrated by an operative and adequately staffed CWSA office for the collection of consumer fees and operation and maintenance of the system.</p> <p>11. Technical viability of the Bequia desalination, water distribution and renewable energy pilot is demonstrated by an operative desalination plant producing 50 cubic meters per day and an operative renewable energy device producing an average of 10,000 kWh per month.</p> <p>12. Financial viability of the Bequia desalination, water distribution and renewable energy pilot is demonstrated by a financing mechanism which includes: (i) tariffs and budgetary contributions that guarantee the operation and maintenance costs for the desalination plant and water distribution system; and (ii) a renewable energy source offsetting the incremental costs of providing power for the desalination and pumping systems.</p> <p>13. The Ministry of Health and Environment gains capacity to manage water stresses related to climate change through the extraction of useful lessons (evidenced by the publication of at least one technical note and the implementation of at least one workshop for government, private sector, and non-profit stakeholders in St Vincent & the Grenadines) from the Bequia pilot.</p> <p><i>Dropped due to the cancellation of this pilot.</i></p>
<p>Indicators linked to GEO</p>	
<p>7. GEF uses the lessons learned in at least one GEF adaptation project.</p> <p>8. Contributions are made toward better definition of adaptation performance indicators</p>	<p>14. The CCCCC disseminates lessons learned through technical notes to be posted in its own and participating countries' websites.</p> <p>15. The University of West Indies receives from the Meteorological Research Institute of Japan useful climate modeling data to enhance its regional climate model and makes use of the results in research and teaching.</p> <p><i>Dropped due to indicator's ambiguity</i></p>

1.4 Main Beneficiaries

14. The SPACC Project was a climate change adaptation Project, with a strong focus on biodiversity protection. The Project addressed the main drivers of biodiversity loss and tests pilot measures to mitigate them. The activities implemented by SPACC have primarily focused on impacts of climate change on the global commons (mainly biodiversity, but also water resources, land degradation and reduction of CO2 emissions). The Project has been successful in showing how specific adaptation activities and planning can be practically translated into a national dialogue and ultimately national policy. The Project pilots have been designed in the context of climate change, addressing present and future climate change impacts.

15. Another significant benefit arises from the gathered knowledge, of global value, on how to implement adaptation measures in small island states that can be scaled up within participating countries and also applied to other countries in the region, and even for islands in other areas of the world, as demonstrated by the knowledge exchanges between the project team at the Bank and teams working on similar issues in the Pacific islands. The knowledge generated through the Project has benefited the participating countries, the implementing agency (which is the regional center of excellence on climate change issues), and the Bank. It has also strengthened national capacities to implement multiple multi-lateral environmental agreements, the so-called three Rio conventions (dealing with biodiversity, climate change, desertification), which implies an increased local capacity to implement such agreements.

16. Finally, the Project has also produced benefits at the national and local level. The Project's main direct beneficiaries include local populations who would benefit from the adaptation measures implemented through SPACC, which bring about biodiversity conservation, improved stewardship and better management of natural protected areas. All pilot activities implemented in Dominica are developed on or around their National Parks, with the objective of protecting them against anthropogenic impacts. At the same time, they have benefited local farmers of the Milton area communities, and the National Government through the strengthening of information and monitoring capabilities at the Ministry of Agriculture. The Saint Lucia pilot implemented in Fort Vieux managed to eliminate the direct outflow of waste water from a large touristic resort into Point Sable National Park, which safeguards biodiversity at the National Park, prevents further land degradation, and protects water resources in the area. It also benefits the tourism sector, crucial in the Caribbean, since it reduces water consumption that is currently being purchased from the water supply company. The other Saint Lucia pilot, the retrofitting of the Marchand building (which is a community center on a poor neighborhood of the capital city, Castries), has benefited the local communities who use the building as the main hurricane shelter in the area, as well as for recreational and community engagement purposes. It has also provided lessons useful at the national level for the replication of building codes and modalities into other hurricane shelters. The pilot implemented in Saint Vincent, if replicated, is expected to alleviate pressures on coastal aquifers, which can be seen as a measure against land degradation. The photovoltaic system reduces the consumption of fossil fuel on the island, further benefiting global common goods by deploying carbon-free technology. It also benefits the Paget Farms area, where the poorest communities of the island are settled, by providing a constant source of potable water.

1.5 Original Components (*as approved*)

Component 1: Identification, evaluation, selection and design of priority adaptation measures that address impacts of climate change on biodiversity and land degradation

17. This component's objective was to identify and design in detail (integrated) pilot adaptation measures to reduce expected negative impacts of climate change on marine and terrestrial biodiversity and land degradation in Participating Countries (PCs) Dominica, Saint Lucia and St. Vincent and the Grenadines. The component had two sub-components: (i) feasibility analysis of adaptation measures; and (ii) design of adaptation measures. The component was aimed at supporting the following activities: (i) assessment of the current ecosystem and physical condition and trends in coastal areas of the Participating Countries; (ii) provision of data by the MRI on estimated current and future temperature and rainfall patterns along Project sites; (iii) analysis of specific climate change impacts, primarily concerning biodiversity of global significance and assessment of alternatives including, *inter alia*, technical, environmental, social, institutional, and risk and cost analyses; (iv) selection of recommended actions; (v) technical, engineering design; (vi) environmental and social management plans; (vii) community participation; (viii) M&E system design to measure the impacts of adopted measures; and (ix) establishment and adoption of plans and cooperation agreements by PCs with local and regional institutions and agencies for implementation of adaptation measures.

Component 2: Implementation of selected adaptation measures designed to address climate impacts on biodiversity and land degradation.

18. The component's objective was to implement specific pilot adaptation measures on seven sites in the Participating Countries addressing primarily the impacts of climate change on biodiversity and land degradation along coastal and near-coastal areas. This component had seven sub-components: (i) the coordination of adaptation measures in the PCs; (ii) implementation of adaptation measures in Dominica, identified in the management plan under component one; (iii) management of the Morne Trois Pitons National Park Integrated Ecosystem (Dominica); (iv) sustainability of Water Resources and Supply of the Vieux-Fort Region (Saint Lucia); (v) strengthening critical coastal infrastructure in the Castries area (Saint Lucia); (vi) Integrated Ecosystem Approach to Climate Change (St. Vincent and the Grenadines); and (vii) Climate Change Risk Management for Spring Village (St. Vincent and the Grenadines).

19. This component was expected to support the following activities: (i) provision of data for analyzing the pressures on biodiversity and land degradation from anticipated climate projections; (b) in-country coordination and supervision by each of the PCs on the implementation of the relevant adaptation measures; (iii) maintaining ecosystem integrity, and preventing its fragmentation and biodiversity losses in the face of changes in temperature and rainfall patterns in Dominica; (iv) establishing adaptation measures aimed at increased resilience to the impacts of climate change in Saint Lucia; (v) providing scientific and engineering services required to assess vulnerabilities and define priorities in the Castries region (Saint Lucia); (vi) completing Island Integrated Resource Management Plans and implementing key adaptation measures to address water supply (Bequia); (vii) reducing vulnerability to climate change impacts on Black Mangrove stands in Union Island; and (viii) including coral reefs affected by increased sea surface temperatures and sea level rise based on the monitoring program supported through MACC.

Component 3: Strengthening of national capacity to implement multiple multilateral environmental agreements.

20. The component's objective was to finance goods and services required to develop and establish the building blocks for addressing multiple convention objectives as adopted by the three governments and promoted by the United Nations Framework Convention on Climate Change (UNFCCC), Convention on Biological Diversity (CBD) and United Nations Convention to combat desertification and drought (UNCCD). This component included three sub-components expected to support the following activities: (i) developing a harmonized national reporting framework (i.e., legal, institutional and management structures) by each Participating Country that integrates climate change, biodiversity and land degradation obligations; (ii) providing technical assistance by IUCN to Participating Countries to develop a single

report using a harmonized national reporting framework; and (iii) testing of the application of a harmonized framework in relation to specific adaptation measures supported by the Project.

Component 4: Project Management.

21. The component's objective was to support the overall technical coordination of the Project activities and to help with the operational expenditures directly related to the implementation, management and monitoring of the Project. This component included two sub-components expected to support the following activities: (i) administrative and financial management of the Project; (ii) preparation of annual audits; (iii) operational expenditures comprising: equipment lease and maintenance, utilities, office and scientific supplies and equipment, communications, vehicle fuel, bank charges, travel and per diem of Project staff, and salaries of core Project staff hired for the duration of the Project, but excluding salaries of any permanent staff of the participating countries.

22. Additionally, this component was expected to develop a communication strategy for communicating the results of the Project to other projects and to distribute information. The elements of the strategy included (i) the upgrading of the web site of the CCCCC; (ii) the development of a monthly electronic and printed newsletter; (iii) the participation in global and regional forums on adaptation; and, iv) the publication of the description of the pilots and of the lessons learned in adequate technical journals.

1.6 Revised components

23. The mid-term review (September 2010) included a thorough analysis of the project implementation, identifying the constraints and recommending the restructuring of the project, while leaving the philosophy of the components, their distribution and flow unchanged. The restructuring involved dropping two of seven pilot projects, reallocating project proceeds and changes in the project performance indicators to better reflect the objective of piloting adaptation measures while generating global knowledge and ground experience to be replicated in other countries and regions. Since two pilots were canceled, the overall scope of the Project was reduced. However, SPACC original objectives did not change after the restructuring.

1.7 Other significant changes

24. The project was restructured on September 14, 2010. Two out of the seven pilot projects were canceled, resulting in a reduction of the total scope of the Project. The restructuring also included some reallocation of proceeds amongst components to reflect higher costs in design (Component 1) and lower costs in Component 3, and some modifications of the financing plan to reflect shortages of funds by the participating countries, IUCN, and increased resources provided by CCCCC. Reasons are further explained in section 2.2.

25. The restructuring of the Project involved changes in the outcome indicators in order to more accurately reflect the Project's objectives and the nature of the interventions; modifications to the Project activities in St. Vincent and the Grenadines (cancellation of 2 pilots); adjustment of the disbursement categories to finance workshops and operating costs; modification of the financing plan to close the financing gap created by changes in the co-financing resources; and reallocation of the proceeds of the GEF Trust Fund Grant. The changes in target values, monitoring instruments and responsibilities, as well as costs by pilot are detailed in Annex 3.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

26. Project preparation and design has followed Bank guidelines and has been based on previous experiences gained from MACC, CPACC and related programs. Inherent in the design was a multi-country, multi-agency approach which requires a high degree of interagency coordination. Execution responsibilities were transferred by agreement to the CCCCC and the National counterpart execution has been managed through national coordinators assigned to work with CCCCC. Stakeholder meetings were held during the preparation phase and screening processes were used to identify candidate interventions.

27. *The Project was complex and ambitious given the funds available.* While important on a regional scale, the Project focused on pilot activities designed to address issues on a national scale. The blending of the national and international perspectives resulted in a Project that was extremely ambitious considering the level of funding available and the complexity of implementation. Moreover, the Project's activities spanned from biodiversity protection and management of National Parks to infrastructure works for building retrofitting, renewable energy production, meteorological monitoring or climate change modeling and scenario generation. This variety of interventions would have required the participation of many different types of expertise both in-country and at the implementing agency level. These challenges were recognized and addressed by engaging experts on these different topics, but also required extra time and resources.

28. *Project design lacked specificity.* The description of the Components was general in nature and actual activities were largely determined by the result of studies and designs prepared during the Project's implementation. While this is not necessarily a problem in large projects, the funding levels appropriated under this Project were insufficient to take this kind of approach. The Project had to be restructured, and two out of the initial seven pilot interventions were dropped because of land tenure issues, not anticipated during preparation. Most of the core time of Project implementation was devoted to agreeing on final designs, finalizing them, and preparing bidding documents, instead of improving the operation arrangements and performing monitoring of the different pilots. This process however proved to be useful as different actors in the participating countries engaged in the decision making process during the design phase, and obtained significant insights and capacities to improve the quality of interventions moving forward, and be better prepared to scale up successful activities in the future.

29. *Lack of clear national counterparts that link responsibility with authority.* A significant issue inherent in Project design was the effectiveness of the implementation arrangements. In all cases, specific national line agencies were engaged to support Project development through the use of a national coordinator. Although the Grant Agreement stipulated that participating countries should provide resources for national coordination, financial shortages generated in part by the international financial crisis prevented this from happening (with the notable exception of Saint Lucia). The implementing agency, however, stepped up to this challenge and with their own funds hired technical coordinators for Saint Vincent and Dominica. In general terms, however, these coordinators did not have the authority to speak on behalf of government. Critical decisions required to ensure the success of the Project were diffused through participating agencies with no clear mechanism for getting to definitive decisions and binding agreements. As a regional technical advisory agency, CCCCC is limited in its ability to affect national decisions. It has to be noted, however, that once the Project was restructured, and its final scope better defined, the implementation phase sped up significantly and the Project ultimately met its goals.

30. Illustrations of the above mentioned issues include: (i) the development of the desalination plant in Bequia, St. Vincent involving two basic elements; installing a plant to provide freshwater for the target community of Paget Farm, and the installation of a renewable power generation facility to reduce

operation costs. In theory, this approach would generate revenue to support maintenance of the plant by selling power back to the national grid. While in theory the idea is excellent and technically sound, missing from the design was the inclusion of a mechanism to ensure that the policies of the national power company (VINLEC) would be changed to allow the purchase of excess power. Additionally, binding arrangements with the national water authority (CWSA) for operation and maintenance of the plant were also left to the implementation phase. A positive aspect to this is that the Project served as a catalyst to start the dialogue on those issues and anticipate some of the shortcomings that will appear when the approach is scaled up to the rest of the island and/or to other islands.

31. Similarly, in Dominica, the Project funded the installation of a pilot irrigation system supporting farmers engaged in alternative agriculture projects, notably greenhouse agriculture. In this case, the Project design was focused on the contribution to agricultural alternatives without considering the operational requirements of a community irrigation system. As irrigation is somewhat new to Dominica, no national mechanisms exist to empower communities to get organized, operate and maintain such systems. This requires the formation of a water association and the empowerment of the association to charge user fees, contract for maintenance and manage water distribution within the user community. While the pilot is contributing to help steer the dialogue in Dominica towards the organization of water user associations, these are not yet in place due to gaps in existing regulations. These gaps have been identified, and are currently being addressed, which has been an unintended positive aspect of the activity.

32. *Project implementation was committed to a regional agency to coordinate and carry out infrastructure activities in sovereign countries.* Whereas CCCCC has an excellent record managing knowledge and monitoring efforts, this project was one of the first of its kind to be implemented by CCCCC. It required the signature of contracts to perform works in sovereign countries, works that should comply with all national requirements and regulations. The CCCCC has undertaken enormous efforts to ensure that works followed national guidelines and requirements, and that relevant stakeholders were involved in the decision making process.

2.2 Implementation

33. The implementation responsibilities were identified in the Grant agreement between the CCCCC and the Bank, whereas responsibilities assigned to participating countries (PCs) were agreed between CCCCC and the PCs through specific Participation Agreements. While the general expectations for the agreements were identified in the Grant Agreement, the specific activities to be included were broadly defined while details had to be developed during the execution of the Project. This strategy of having a wide, unspecific definition of activities at PAD level automatically required high involvement, engagement and leadership from the implementing agency, constant on-the-ground presence, and high convening power to bring all stakeholders to the negotiations table and agree on activities, responsibilities and policy changes needed. This was a cumbersome undertaking for a relatively young and small implementing agency.

34. As required under the Grant Agreement, Project coordinators were to be appointed for each participating country to serve as the national focal point and the national counterpart to the CCCCC. Additionally individual countries were to provide direct financial support. Third party financing was also included under the Grant Agreement to be managed by the CCCCC. Specifically these included: International Union for Conservation of Nature (IUCN) agreed to provide assistance in the form of an in-kind contribution to assist in the financing of Component 3 of the Project; the Meteorological Research Institute of Japan (MRI) agreed to provide assistance in the form of an in-kind contribution; and the Government of Italy agreed to a grant in an amount equivalent to US\$320,000 to assist in the financing of the operation and management by the CCCCC.

35. As the implementation agency, CCCCC was charged with the operational management of the Project to include procurement, financial management, supervision and reporting as well as providing direct technical assistance to the PCs for development and implementation support. Bank activities included primarily regular supervision missions to the PCs, coordination amongst actors and technical support to CCCCC and country teams. The structure of the Project and the involvement of multiple agencies in each country resulted in an implementation process that was overly complex, tremendously time consuming and created, in some cases, in significant implementation delays. Given the diverse nature of the Project activities both technically and geographically, it is clear that the Project was underfunded with respect to implementation and supervision requirements. Moreover, the supervision budget for CCCCC was only based on a percentage of grant value. This budget was also supposed to provide for fiduciary support, external audits and other related expenditures. Given the small size of the grant, funds allocated did not reflect the level of effort required to run a project in three countries over a 5 year period.

Issues Encountered During Execution

36. *Project Organization:* While technically experienced in funds management and contract execution, CCCCC encountered difficulties with the country counterparts early in Project implementation largely related to the organization and management of the Project. Weaknesses became apparent early in the process notably with the technical management team provided by CCCCC and the requirement to operate through a system of country project coordinators. These required political negotiations with the respective countries to ensure effective project coordinators were appointed. The diffusion of authority between the participating country agencies, Project coordinators and CCCCC created a significant impediment to implementation as no central point of authority at the national level was available to make decisions with respect to specific interventions or implementation activities on the ground. This lack of clear decision authority was particularly problematic in St. Vincent and Dominica. In St. Lucia, the problem was no less significant but was generally overcome due to the management skills of the coordinator and the participation of government agencies not originally involved in Project design. With respect to CCCCC, as a regional agency their strengths relate to funds management and general technical assistance on a macro scale. The management team selected to oversee the Project lacked the technical support required to implement specific activities at the country level. Additionally, with much of the operational responsibility placed on the national coordinators, CCCCC's ability to directly influence implementation and decisions was limited, affecting the efficiency of Project execution.

37. *Technical Capacity:* Technical capacity was challenging both with respect to CCCCC and country level support. With respect to CCCCC, this Project represented a departure from the type of project they have managed in the past. SPACC required significant technical support and CCCCC encountered difficulties in assembling an appropriate team to manage this aspect of the Project, especially given the reduced level of funding for Project management. Agencies involved on behalf of the PCs lacked the technical competency needed for Project execution. This hardship was identified by the Bank, and management teams responded by providing significant technical assistance to client countries to assist with Project execution. These difficulties carried additional project management costs not envisioned in Project design. As a result, CCCCC needed to identify additional funding resources to cover these increased technical assistance costs.

38. *Inappropriate levels of funding:* The Project initially included US\$200,000 to conduct identification, evaluation, selection and design of adaptation measures (Component 1). However, these tasks required greater levels of effort, including frequent trips by CCCCC from Belize to the PCs. The Project required highly specialized studies with participation of cutting-edge institutions, such as the hurricane wind study, performed for Saint Lucia, or the preparation of specialized designs and technical specifications for the desalination plant and alternative power generation in St. Vincent. Resources allocated to these tasks were insufficient, and a restructuring had to be done to reallocate more resources

from elsewhere. Regarding the actual on-the-ground pilot projects, the budget initially allocated was US\$1.5M. Unfortunately, there was no consideration for design requirements or how those resources would be distributed amongst the PCs. Seven pilot projects were supposed to be financed with those funds, but it became clear that significantly more resources were needed.

39. *Financial crisis affected some programmed activities:* The international financial crisis impacted some of the planned activities. The PCs, who were largely dependent on tourism, were significantly impacted, and as a result, failed to provide their expected counterpart funding. To promote continued country participation and to comply with requirements for country contributions, the Project was restructured to include the provision of in-kind contributions. The IUCN, whose contribution under component 3 was essential to lead, coordinate and execute the different activities of this component, suffered some financial hardships that forced them to withdraw from the Project. This component was downscaled to a smaller but still useful number of activities. In St. Vincent, the Government's contribution was focused on financing the water distribution system at the Paget Farm community, while the Project would finance the desalination plant and the sustainable energy source. This was reflected in a memorandum of understanding between CCCCC and the Government, and at some point, cash sources were actually inscribed in the national budget for this purpose. However, this contribution never materialized and, up to date, the CCCCC has had to find additional sources of funds to cover the shortfall. With these new funds, the main pipes and connections would be financed, while household service connections are to be financed through the United States Agency for International Development (USAID) project that is currently (May 2012) being prepared.

40. *Procurement issues:* Challenges, arising from the regional nature of the Project, hindered several Project activities. In particular, the two pilots in St. Lucia required co-financing. In the case of the Castries pilot, co-financing was between the Project and the government of St Lucia. For the Vieux Fort rainwater pilot, the agreement was between CCCCC and the CCBRAS resort. For the retrofitting activity in Castries, the initial intention was to hire a single contractor to perform the retrofitting of the Marchand Building and finance the contract with Project and Government resources. During execution, it was discovered that by law, all Government procurement activities had to comply with national procurement regulations and pass through the St. Lucia Central Tenders Board, while Project procurement are processed following Bank guidelines and through the CCCCC in Belize. This created a situation that was not foreseen, and was resolved by splitting the construction contract into two contracts, to be financed by the government and the CCCCC. The arrangement worked, but imposed significantly higher supervision and management challenges. This was only overcome thanks to the zeal with which institutions in St. Lucia participated and the engagement of a motivated and cooperative contractor. For the case of Vieux-Fort, the issue was less complicated. The private sector counterpart had no difficulty in transferring their contribution to CCCCC in order to sign a single contract. However, as a private sector project partnership, an atypical financial agreement had to be crafted and cleared by the Bank and CCCCC lawyers in order to specify liabilities and provide for the need of extra cash should contingencies arise.

41. *Project delays:* Owing to complexities in the design of project management and implementation arrangements, significant delays were experienced during execution. These related primarily to: (i) lack of clear decision authorities in implementing countries; (ii) lack of country technical capacity; (iii) limited budget and thus limited technical support on the CCCCC management team; and, (iv) elements requiring national policy and land acquisition issues that had to be resolved prior to execution.

42. *Project closing date extension:* Given the delays noted above, the Project would have benefited from a one-year extension. This would have allowed sufficient time to finalize all activities and have longer monitoring periods. The possibility was discussed; however, SPACC was a regional Project that requires high levels of supervision and travel, with higher than normal supervision costs. By the time of the restructuring, the resources allocated to CCCCC's Project management (component 4), were already

reduced, and were not sufficient to ensure a full extra year of implementation. For this reason, a six-month extension was agreed and approved.

Project Execution and Re-Structuring

43. At the MTR, a range of issues were identified that needed a restructuring of the Project in order to facilitate its success. The main changes introduced through the restructuring were: (i) modification of the Project description to scale down component 2 to reduce the number of proposed pilots from seven to five by removing the pilots in Spring Village and Union Island (St. Vincent and the Grenadines), and component 3 to remove the technical assistance support that was going to be provided by the IUCN; (ii) modifications of the outcome indicators to more accurately reflect the Project's objectives and the nature of the proposed interventions; (iii) modification of the financing plan to close the financing gap created by changes in the co-financing resources; (iv) reallocation of the proceeds of the GEF Grant to correct for extra costs needed in component 1 and savings generated in component 3; and (v) a six-month extension of the closing date of the Project. (See Annex 2 for detailed restructured Outcome Indicators, Activities, Costs and Financing)

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

44. Reporting, monitoring and evaluation included World Bank supervision, which was typically undertaken together with the implementing agency, CCCCC; quarterly IUFRRs (Interim Unaudited Financial Reports) including financial reports and procurement plans; annual work plans and reports; a mid-term review (MTR) conducted jointly by World Bank and CCCCC teams; and the conduct of annual audits. Regular audio-conferences between CCCCC, technical coordinators and Bank team took place.

45. *M&E design:* The design of the M&E, as reflected in the results framework, did not always establish clear links between the objectives, outputs and indicators. Initial monitoring was hard to perform (for example, an indicator related to the number of nesting parrots in a Dominica National Park). Once the Project was restructured, the indicators became easier to measure and to report to, thus allowing the results framework to be used as the instrument to evaluate on-the-ground progress. Quantity and quality of information varies between the three participating countries, with St. Lucia undergoing a very detailed reporting discipline while St. Vincent and Dominica lagged behind.

46. *Implementation and utilization:* As discussed above, there were changes made to the indicators, and a fairly new results matrix was generated after the restructuring. M&E tools, however, should have been inherently built inside each activity, and appropriate instruments for measurement, registry and stocking of information should have been included. Their absence in several pilot activities (in some cases due to increased costs resulting from the purchase of such tools) has prevented a more accurate and detailed gathering of information. Moreover, due to the delays previously mentioned, many activities concluded shortly before Project closing, and there was no time to properly test and improve the M&E arrangements. Additionally, since there was no specific budget devoted to measuring indicators: no detailed surveys, impact analysis or evaluation reports have thus been prepared. The Project, being pilot in nature and regional, had reduced funds to achieve this. However, it would have benefitted from extra resources to better document achievements and lessons learnt, and it is thus suggested to take these considerations into account on any future similar activity.

47. Given the delays in some activities, data collected so far is not completely representative (for example, the Bequia desalination plant, photovoltaic system, or the St. Lucia rain water harvesting system) have been operating for less than 6 months, mostly during the dry season, and it has not been possible to thus fully assess all benefits gained. As mentioned earlier, the initial intention was to seek a

one-year extension of closing date to allow for a period long enough to collect data and refine monitoring aspects, however due to reduced Project management and supervision costs, this option was not feasible. It would be beneficial to evaluate some of the achievements of SPACC in one to two years' time, to help provide key lessons useful for regional development.

2.4 Safeguard and Fiduciary Compliance

A. Safeguards

48. The Project was initially categorized as category B, with minor environmental impacts from on the ground investments. This environmental category has remained unchanged. The original safeguard policies triggered by the Project were Environmental Assessment (OP/BP 4.01) and Natural Habitats (OP/BP 4.04). The Project complied with both safeguard policies.

49. *Environmental Assessment:* The Project was rated as an Environmental Assessment Category "B" based on the fact that most of the activities had low or no environmental impact, were small in scale and narrow in scope. Appropriate environmental management plans were prepared for: (i) the works of the retro-fitting of the Marchand building in St. Lucia; (ii) the construction of the rain water harvesting infrastructure at the roof of a hotel, construction of two small deposits for the rain water, and construction of a treated-waste water tank for irrigation system in St. Lucia; (iii) small construction works for the water intake and piped-water distribution in the agricultural demonstration pilot of Dominica. A simplified Environmental Impact Assessment was prepared for the desalination and photovoltaic energy generation in Bequia. The assessment concluded that, given the small size of the plant and the fact that it would be operative 12-14 hours out of 24, the brine discharge was readily dispersed by the sea currents in the area. The construction of the distribution system also followed basic construction impact mitigation guidelines.

50. *Social considerations:* During the first phases of the Project in Bequia a wind turbine was envisaged as the renewable energy source. A plot of land needed to be acquired, and an access road needed to be built. Moreover, the water distribution tank contemplated the installation of a reservoir on top of the hill at the Paget Farms area in Bequia and the access tank also required some land to be acquired. A Bank social scientist visited Bequia to review the land issues, and highlighted the following: (i) the civil works and the purchase of land would require neither the physical relocation of affected people, nor the replacement of assets; (ii) in the private lands that are required for Project facilities there are no crops, forest or anything that merits compensation beyond the agreements that will be reached for selling or swapping the lands; and (iii) the local people are eager to have the Project done and have participated in providing free labor for the civil works. As a result, the specialist concluded that no social safeguards needed to be triggered. Moreover, the wind turbine was dropped from the Project, and only a small portion of land, belonging to a private family, has been acquired by the government through a voluntary agreement with the owner.

B. Financial Management

51. *Staffing and FM System:* Throughout the Project life the CCCCC was staffed with a seasoned Finance Professional with no turn over. QuickBooks was used as the automated financial management information system, which was able to adequately record and report Project transactions.

52. *Monitoring Reports:* The CCCCC submitted the Project Integrated Unaudited Financial Reports (IUFRRs) on time. Submission delays at completion stage are understandable, since the Finance Unit needs to include all aspects for an orderly close of Project books and accounts, outstanding debts and refunding Closing of DA, including final documentation of expenditures and refund of any outstanding

balances during the grace period. The financial reports were complete and its figures reconciled with Bank records. It is useful to underscore that, instead of submitting IUFRRs semi-annually as indicated in the Agreement, CCCCC opted for preparing and submitting them on a quarterly basis, a clear indication that the Centre valued this management tool for making sound and informed decisions.

53. *Annual Audits:* The Project audit reports for all fiscal years were performed in accordance with International Auditing Standards. They all resulted in unqualified (clean) opinions on the financial statements. The special opinion related to the internal controls and to the compliance with Agreement terms, rules and regulations is also clean. There have been some instances highlighted as areas for improvement, in order to achieve a more robust internal control environment. The Project management promptly acted upon those highlighted areas, and the Bank team followed up and assisted as needed, until all of the instances were resolved and closed. The joint due diligence and care yielded good results and were evidenced in the subsequent audit reports, none of which included recurrent items.

54. *FM Implementation Support Mission:* The final external audit report as of Project Closing Date started rather late. CCCCC had doubts with the period to be audited and its financing source. Once clarified, the audit expeditiously kicked-off, the audit firm performed their field work, and the report has been received and approved by the Bank. It has to be mentioned that the financial reports have been completed and its figures reconciled with Bank records, although, at Project inception, transactions and record keeping required some fine tuning to properly report on the in-kind counterpart contribution from participating countries and CCCCC. It is very clear that the implementing entity (CCCCC), during the life of the Project, has been able to offer reasonable assurance that funds were used for the purpose intended, and that they were properly accounted for.

C. Procurement

55. *Procurement capacity:* Procurement activities were carried out by CCCCC. The procurement function as assessed at appraisal was carried out by a part-time procurement officer from SIF and a seconded staff from the Government of Belize both received one-on-one Bank procurement training in 2007. The Procurement Office hired later for the implementation of the Project also attended the fiduciary workshop in 2009, but resigned. The absence of a Procurement Officer lasted at the peak time of the Project implementation, and the contract administration responsibility had to be left to the Project Manager. The weak procurement capacity delayed new procurement activities to certain extent, though the required procurement capacity was rebuilt for completing the Project.

56. *The procurement plan (PP) and compliance:* CCCCC was updating PP periodically which were assessed by the Bank procurement specialists and were found to be acceptable. Procurement processes are in compliance with the loan agreement, procurement guidelines and agreed procurement plans.

57. *Two International Competitive Bids (Wind Turbine, and GPD SWRO Plant in Bequia):* The bidding documents were prepared by consulting firms. Bank Guidelines and procedures including SBDs were followed by CCCCC and each step of the tendering processes was closely monitored by the Bank team.

58. *Ex-post procurement reviews:* Procurement reviews of the signed contracts were conducted by the Bank's procurement specialist during missions. Most of the time, the Bank recommendations were followed by the implementing agency in a timely manner and the procurement process improved after the review.

2.5 Post-completion Operation/Next Phase

59. The scope of the project was to pilot solutions that would eventually increase awareness, the knowledge base of the PCs and provide experience and lessons to be gradually mainstreamed into programs and plans at national and regional adaptation initiatives, such as the Pilot Program for Climate Resilience (PPCR) under the Strategic Climate Fund of the Climate Investment Funds. The PPCR project, recently launched in the region, is the adequate instrument to replicate lessons learnt in projects such as the SPACC. The PPCR, developed in part with the same institutions involved in SPACC, has included results and experiences of the latter, and aims to replicate some of the most meaningful ones, as already reflected in PPCR project documents.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

60. *Relevance of objectives:* Project development and global objectives remain highly relevant. The PDO supported the efforts of the PCs to implement specific pilot adaptation measures that primarily addressed the impacts of climate change on their natural resource base, with a focus on biodiversity and land degradation. The intended global benefits include increased resilience of ecosystems to adapt to climate change, which would contribute to the reduction of biodiversity loss in national parks and reduction of land degradation. By focusing on addressing primarily vulnerabilities of ecosystems to impacts of CC, the Project has shown some examples on how adaptation planning and assessment can be translated into national policy and sustainable development planning, and how country-driven activities can be integrated into national sustainable development and poverty-reduction strategies, while contributing to higher-level objectives.

61. In terms of the Bank's assistance strategy, the Project's objective remains strategically aligned with the Bank's climate change adaptation work in the region. The SPACC project was a natural continuation of the Caribbean Planning for Adaptation to Climate Change (CPACC) and the Mainstreaming Adaptation to Climate Change in the Caribbean (MACC) projects aimed at consolidating awareness on CC to create a knowledge base supported by testing actual feasible adaptation measures. The scope of CPACC was to build awareness on CC and to strengthening the knowledge base, whereas the following project (MACC) focused on creating the enabling environment for adaptation to climate change, by developing national policy frameworks. In fact CPACC and MACC were Stage I and Stage II adaptation projects as defined by UNFCCC (providing assistance and capacity-building efforts for adaptation, and creation of the conditions and framework needed to take action), and SPACC was the first integral, regional, Stage III adaptation project in the region (Stage III adaptation being the actual implementation of adaptation measures). In this context, SPACC has provided unique outcomes in terms of lessons learned on how to pilot adaptation measures in coastal zones for SIDS. It has highlighted opportunities as well as more work that needs to be done.

62. *Relevance of design:* The design of each pilot was relevant as there was a clear linkage with the global benefits described above. For example, sustainability of water resources was the key environmental issue as well as human, economic sustainability of these countries as identified in St. Lucia's Issues Paper on Climate Change Adaptation & the Water Sector (April 2009). The pilots were designed so as to avoid adverse consequences associated with water resources issues. As mentioned in section 2.1 above, much of the Project design was left to the execution phase in several respects. First, the component descriptions were general in nature and the concrete activities were largely determined after the Project was turned over to the executing agency. In retrospect, in all participating Islands, Project design should have involved the Ministries of Finance to ensure adequate support for policy related decisions. Second, the Project was intended to support the efforts made by the PCs to implement specific

pilot adaptation measures addressing primarily, the impacts of climate change. This included the detailed design of pilot adaptation measures to reduce expected negative impacts of climate change on marine and terrestrial biodiversity and land degradation. Third, the Project design involved the preparation of management plans in each PC, but the lack of specificity led to the build-up of expectations amongst stakeholders that could not be covered with the available funding, creating significant delays as most of the time during Project implementation was devoted to agreeing on final designs.

63. *Relevance of Project implementation:* The relevance of Project implementation lays primarily on the development of harmonized policy, legislation and institutional framework to support the implementation of pilot adaptation investments intended to address the impacts of climate change on the natural resources base of the participating countries. Reducing these impacts would create economic benefits in the tourism, fisheries, agriculture and forestry sectors; help maintain the resource base on which these economic activities rely; and, promote climate resilient sustainable development. The choice of the CCCCC as the implementing agency responded to its excellent record in managing knowledge and monitoring efforts. However, as this was one of the first projects of this kind to be managed by the CCCCC, requiring contracts to perform works in three sovereign countries, several procurement and supervision issues that had not been properly addressed at the design phase, resulted in Project implementation delays and inefficiencies.

3.2 Achievement of Global Environmental Objectives

64. Project objectives were achieved to a large extent. The achievements are evidenced by the successful attainment of the majority of the outcome indicators. Of the fifteen outcome indicators, twelve were achieved satisfactorily and only three indicators were partially achieved (see Annex 4).

Dominica	
<p><i>1. At least one Park Management Plan (including a land use plan for buffer areas) updated and submitted to Cabinet for approval by the Ministry of Agriculture and Forestry, incorporating climate change considerations for the Morne Diablotin National Park and/or the Morne Trois Pitons National Park in Dominica.</i> Achieved</p>	<p>The Park Management Plan for the Morne Trois Pitons has been extensively reviewed since the previous one was over 10 years old. The Morne Diablotin plan has been updated and climate change considerations have been added. Both plans were consulted with main stakeholders, in various workshops, and were approved and adopted by the competent authority (Secretary of Agriculture and Forestry). The submission to the Cabinet is an administrative step that falls outside the scope of the Project, and needs to happen when political, economic and other conditions are adequate. The team was informed, however, that this step is underway. The new plans have mainstreamed climate change concerns in Park management, a step that will help in the long term goal of conservation and stewardship of Dominica’s significant natural resources.</p>
<p><i>2. Ministry of Agriculture and Forestry creates and maintains a comprehensive database of key ecological variables useful for Park Management.</i> Achieved</p>	<p>An extensive database, collecting information about studies, reports, articles and other sources of information, comprising twelve different datasets, has been prepared and delivered to the Agriculture Information, Communication and Technology Unit, AICTU, from the Ministry of Agriculture and Forestry. This was the first of its kind database for the country and is placed at the “Mfiles database system” (a Regional Clearing House Mechanism, located in Belize, which is a regional hub and repository of information), available for other users. There was a hand-over event, during which Government officials committed to the maintenance and improvement of the database.</p>
<p><i>3. The Ministry of Agriculture and Forestry installs at least one new</i></p>	<p>The two meteorological stations have been purchased, and extensive coordination was maintained to ensure that they become part of a wider</p>

<p><i>meteorological station in each of the two Parks and uses information from them for National Park management and/or agriculture planning.</i> Achieved</p>	<p>Caribbean network which will be strengthened under the ongoing CARIB-HYCOS Project³ which is being developed in two components: one covering the continental countries and the other the Islands States. The two stations have been installed and are fully operational and delivering useful data about meteorological conditions on the country. The stations were designed and installed by Ministry staff, with specific support from the Caribbean Institute of Meteorology and Hydrology.</p>
<p>4. <i>The Ministry of Agriculture gains capacity to manage water stresses related to climate change on agriculture through the extraction of useful lessons (evidenced by the publication of at least one technical note and the implementation of at least one workshop for government, private sector, and non-profit stakeholders in Dominica) from an irrigation pilot for the communities of Colihaut, Dublanc and Bioche.</i> Achieved</p>	<p>The irrigation pilot developed at the Milton area, led by the Ministry of Agriculture, has been a pioneer in the country in several community-engagement-related aspects. During its execution, workshops were held with beneficiaries, private sector and other stakeholders. The capacity for managing water stress through the introduction of modern irrigation techniques has been fully achieved. The whole effort has been driven by irrigation officers from the Ministry of Agriculture, who reviewed designs, conducted the field visits, organized the farmer’s communities, and defined operation and maintenance details. This has been the first experience led by the Ministry, and it has helped them improve their capacities and disseminate them to the wider interested audience.</p>
<p>Saint Lucia</p>	
<p>5. <i>Results from the implementation of the Vieux Fort rainwater harvesting and waste water treatment pilot documented and disseminated by the Ministry of Physical Planning and Environment through the publication of at least one technical note and the implementation of at least one workshop for government, private sector, and non-profit stakeholders.</i> Achieved</p>	<p>The rainwater harvesting experience has yielded many positive experiences, which have been captured in relevant documents by the Ministry of Physical Planning and Environment, and several workshops/dissemination events have taken place. The Ministry, in coordination with the hotel where the rainwater harvest system was installed, organized dissemination events with other hotels and resorts, increasing the regional impact of this activity on tourism, which is a fundamental source of revenue in the Caribbean.</p>
<p>6. <i>Vieux Fort rain water harvesting system reduces the consumption of 3,000 cubic meters per year of potable water from the water utility.</i> Achieved</p>	<p>There is not yet enough data to estimate this number, since the rainwater storage tanks were installed at the end of 2011, and since then it has been dry season in the country. But the 18,000 liter and a 27,000 liter tanks, already built (a total of 45 m3 installed capacity) are used daily for pool topping, reducing the consumption from the water utility, leading to the conclusion that the indicator has been met. Moreover, all the irrigation system of the facility is now performed with treated waste water, and no water for irrigation will be taken from the water utility (DOWASCO). This reduces the pressure on an already stressed water supply system, ensuring continuous water supply for the inhabitants of the area.</p>
<p>7. <i>The Ministry of Physical Planning and Environment submits for Cabinet approval a decree to enforce rain water harvesting on new commercial touristic activities.</i> Partially achieved</p>	<p>The proposal to enforce rainwater harvesting on new touristic developments in St. Lucia has been fully prepared. The enforcement of rainwater harvesting cannot be taken by Cabinet without a deep review of national legislation and framework, country safeguards and other requirements, and these are activities falling outside the scope of the Project. Therefore the Ministry of Physical Planning has not yet officially submitted the proposal, but has brought up the dialogue to the highest levels of Government and is now being discussed at national level.</p>

³ Caribbean Hydrological Cycle Observing System. Support to Natural Disaster Prevention and Water Resources Management (CIC/CARIB-HYCOS) Project Document, August, 2004

<p><i>8. Successful Vieux Fort waste water treatment system contributes to reduce organic load to the coastal ecosystems in the Pointe Sable Environmental Protection Area of St. Lucia by cancelling actual waste water sewerage outflow into the coast.</i> Achieved</p>	<p>All wastewater produced by the hotel is currently being treated in their treatment plant and subsequently being reutilized for garden irrigation. The Project installed recirculation pumps that brings treated water into the irrigation system, and therefore there is no more direct outfall into the coast. Moreover, the utilization of treated water to irrigate the hotel's gardens is reducing the usage of potable water, expanding the irrigated area to improve the attractiveness of the resort, and at the same time reducing the organic load of treated water since part of it is used by plants as fertilizer.</p>
<p><i>9. Information campaign implemented by the Ministry of Planning and Environment to disseminate the lessons of the Marchand building pilot.</i> Achieved</p>	<p>The Ministry of Planning and Environment has disseminated the experiences gained with the Marchand building which is commonly being used as a flagship experience. This building is also a center for community engagement on a poor area of Castries, and more importantly, serves as hurricane shelter. As such, the visibility of the works performed in this structure has been remarkable. Architects, structural engineers and staff from the Government have been involved since early stages of the Project, and both the Ministry of Social Transformation and the national emergency management office have contributed to the design and implementation, gaining valuable insights that are currently being mainstreamed in the retrofitting of similar facilities.</p>
<p><i>Saint Vincent and the Grenadines</i></p>	
<p><i>10. Institutional viability of the Bequia water desalination and distribution system is demonstrated by an operative and adequately staffed CWSA office for the collection of consumer fees and operation and maintenance of the system.</i> Achieved</p>	<p>The CWSA, engaged in the Project since the first stages, has executed the full design of the system (nominal water output of desalination plant, distribution system design and supervision, water storage tank designs and locations) and has contributed financially as well as in kind. Currently CWSA is reviewing the financial assessment in order to fix consumer fees for the water produced. This will be a challenging process since it will be the first example of fee collection from CWSA on any Grenadine island, and the introduction of fees on Grenadine islands is a highly politicized issue.</p>
<p><i>11. Technical viability of the Bequia desalination, water distribution and renewable energy pilot is demonstrated by an operative desalination plant producing 50 cubic meters per day and an operative renewable energy device producing an average of 10,000 kWh per month.</i> Achieved</p>	<p>The desalination plant has been fully installed and commissioned, at the Fisheries Complex on the Paget Farms community in Bequia. The plant has been interconnected to the electrical grid, and has been producing potable-quality water since July 2011. The water production output of the plant is 60m³/day. An 80kW photovoltaic system has been installed on the roof of a hangar at Bequia's local airport. This system provides over 10,000 kWh per month. Useful information on the investment costs, operation and maintenance costs has been collected, and a financial assessment of the scheme has been submitted to Government and utility agencies. Both the desalination plant and the renewable energy system proposed are fully functional.</p>
<p><i>12. Financial viability of the Bequia desalination, water distribution and renewable energy pilot is demonstrated by a financing mechanism which includes: (i) tariffs and budgetary contributions that guarantee the operation and maintenance costs for the desalination plant and water distribution system; and (ii) a renewable energy source offsetting the incremental costs of providing power for the desalination and pumping systems.</i> Partially Achieved</p>	<p>The operation of the system will be covered through the collection of consumer fees. Additional financing for maintenance costs will arise from the selling to VINLEC, the Electricity Utility, of excess energy produced by the solar panels. However, the water distribution system is currently being finalized and as such no fees are yet being collected and the power purchase agreement with VINLEC has not yet been concluded, as the details are still being defined. An unexpected benefit of the Project is the experience gained through the drafting and signing of this purchase agreement.</p>

<p>13. The Ministry of Health and Environment gains capacity to manage water stresses related to climate change through the extraction of useful lessons (evidenced by the publication of at least one technical note and the implementation of at least one workshop for government, private sector, and non-profit stakeholders in St Vincent) from the Bequia pilot. <i>Partially Achieved</i></p>	<p>The Ministry of Health has been the main counterpart of the SPACC Project since its origin. The Ministry has devoted part-time staff on a regular basis for the design and implementation of activities, and has received a report on investment, operation and maintenance costs of the setup. Site visits from relevant Government officials, utility officials and other stakeholders have been taking place during installation and operation, and concept and operation have been illustrated. The whole scheme is not yet fully assembled, and therefore a final workshop and note are still forthcoming. The project team considers that there is enough evidence indicating that both CCCCC and the participating countries are committed to complete the few ongoing final works.</p>
<p>Regional / Global Value</p>	
<p>14. The CCCCC disseminates lessons learned through technical notes to be posted in its own and participating countries' websites. <i>Achieved</i></p>	<p>The CCCCC has prepared notes and posted them in their web pages. The CCCCC team has been invited to various regional conferences to share experience from SPACC, including the workshop on “Sharing Experiences in the Design and Implementation of Climate Change Adaptation Measures in Latin America” held in Lima in January 2009, the regional workshop on “Climate Change Adaptation in Wetlands” held in Mexico in March 2010, and the UNFCCC Technical Workshop on “Costs and Benefits of Adaptation Options under the Nairobi Work Programme” held in Spain in January 2010. Also experience from SPACC was shared at the World Bank’s seminar on “Global Exchange on Adaptation in Small Island Nations” (featuring Pacific Islands, Caribbean, Indian Ocean) in November 2010, and a panel discussion entitled “Design of Coastal Infrastructure in a Warmer World; Lessons from Operational Experience” held in March 2011. Additionally, SPACC has contributed to developing and designing adaptation operations in other countries. For example, SPACC has been fundamental in the choice of countries for the PPCR Project, which can be seen as a scale-up activity in the region bringing significant additional resources to work on adaptation to climate change. PPCR has chosen the three SPACC countries, together with a few others, and is using lessons and experiences to design its own activities. The first approved PPCR project documents capture SPACC's activities and commit to scale up some of the more significant ones. SPACC and now PPCR have also leveraged additional funds, for the Regional Disaster Vulnerability Reduction Project (US\$20.92 million) financed by PPCR and IDA, which aims at measurably reducing vulnerability to natural hazards and climate change impacts in the Eastern Caribbean Sub-region including St. Vincent and the Grenadines. Experience from SPACC also benefitted Samoa PPCR through a cross-support by the TTL for SPACC visiting Samoa and providing recommendations and technical assistance, specifically on ecosystem-based adaptation of the coastal biomes to the consequences of climate change</p>
<p>15. The University of West Indies receives from the Meteorological Research Institute of Japan useful climate modeling data to enhance its regional climate model and makes use of the results in research and teaching. <i>Achieved</i></p>	<p>The University of West Indies sent two scientists to the MRI at Japan, where they were trained in the use of the Earth Simulator, a supercomputer devoted to climate simulation. Both scientists are teachers at the University and useful results of the Earth Simulator are currently being used on a number of initiatives such as additional work towards improvement for climate change models. Similar trainings on Japan have been taken by other scientists from meteorological organizations in Latin America and the Caribbean, which ensures coherence and sharing of information and methods.</p>

3.3 Efficiency

65. As required for a GEF Project, an incremental cost analysis was done at appraisal. The Project objective was to support efforts by the participating countries to implement specific pilot adaptation measures addressing the impacts of climate change on biodiversity and land degradation. Therefore, the Project components were designed to cover all necessary steps for effective preparation for climate change adaptation, comprising: the evaluation design and selection of adaptation measures (component 1), the implementation of pilot adaptation measures covering the main impacts of climate change (component 2), the institutional arrangement necessary to effectively respond to the multilateral environmental commitments (component 3) and the Project Management (component 4). The Project also tried to produce knowledge of global value on how to implement adaptation measures in SIDS that can be applied in other countries in the region and even for islands in other regions of the world.

66. The restructuring of the project addressed the implementation constraints improving efficiency. In effect, the restructuring contributed to redirect financial resources across components to cope with increased costs arising from the design of the pilots and to include the reduction of financial contributions of donors and beneficiary countries. In terms of cost-effectiveness of the measures piloted, it is worth mentioning the case of the pilot in Bequia, a small island in the Grenadines, with few/no surface running water and few/unknown underground water deposits. Paget Farms, where the desalination plant is being operated, had no water distribution system at all and inhabitants had to collect rain water and store it in large underground deposits that at times account for 1/3 of the total cost of the house. The costs associated with this were extremely high and the desalinized water abates them significantly.

3.4 Justification of Overall Outcome Rating

Rating: Moderately Satisfactory

67. The overall outcomes are rated as moderately satisfactory. The PDO/GEO remains highly relevant, and has been achieved through the Project activities. The Project Development Objective (PDO) was to support efforts by the participating countries to implement specific pilot adaptation measures addressing primarily, the impacts of climate change on their natural resources base, focused on biodiversity and land degradation along coastal and near-coastal areas. The Global Environment Objective (GEO) was to produce knowledge of global value on how to implement adaptation measures in small island states that can be applied in other countries in the region and in other islands in other parts of the world. In addition to the climate change adaptation objective, the Project also contributed to biodiversity conservation objectives by supporting the design and implementation of specific adaptation measures that would enhance the resilience of vulnerable, globally-important ecosystems and biodiversity. The design was based on international perceptions and experiences related to climate change adaptation priorities. The Project focused on pilot activities designed to address issues on a national scale. The blending of the two perspectives, national and regional resulted in a Project that was overly ambitious considering the level of funding available and the complexity of implementation.

68. On the strengths of the Project, after the mid-term review, the outcome indicators were modified to more accurately link to the Project's objectives and the nature of the proposed interventions. The vast majority of the indicators were achieved by Project closing date. The SPACC Project was fundamental in keeping the dialogue on climate change adaptation at a national and regional level, and to leverage extra funds for this purpose. Pilot activities have been concluded, and currently there are several attempts at scaling them up. Should this happen, the impact generated through SPACC would be multiplied. The capacities within CCCCC (the regional center of excellence for climate change) have also been reinforced by the Project. Through component 3, the Project made its contributions in terms of developing a systematic reporting framework, providing valuable feedback to other countries in the region on the practical and institutional integration of the conventions. In the institutional area, the Project contributed

to strengthening the PCs' institutional capacity to implement Multilateral Environmental Agreements (MEA) with an integrated and holistic approach intended to reinforce the multilateral environmental policy in the region. In summary, the restructuring of the project after the MTR seemed quite effective and was clearly successful in providing a positive impetus to the implementation of the project.

3.5 Overarching Themes, Other Outcomes and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development

69. The Project did not have an explicit poverty objective. However, it is important to note that in the case of Bequia, the provision of fresh water to a poor community that had no running water (Paget Farms) is expected to generate multiple benefits, including health and reduced costs for housing through avoided construction costs for the large water tanks built under each house, and the water pumps needed to bring the water to the house. The irrigation pilot in Dominica was also implemented in a poor area in the Milton community, and has engaged farmers to provide them with an improved irrigation scheme. The Project has managed to improve the economic, social and environmental resilience to climate change at the community level, and stir the dialogue at national level. It has also managed to protect and strengthen the livelihoods of people and communities who depend on the ecosystem goods and services at the sites and prevent encroachment and deterioration of surrounding ecosystems and biodiversity around the settlement areas.

(b) Institutional Change/Strengthening

70. The Project has contributed to empowering people to do things together. It has had an impact on communities attracting their collaboration and participation. In St. Lucia the Ministry of Environment is in the process of preparing the legislation needed for requiring hotels to build rain harvesting strategies to reduce the consumption of water, and is using lessons learnt at the Marchand building for the retrofitting of critical infrastructure against hurricanes. In Dominica the Project has successfully promoted the organization, aggregation and participation of private farmers into farmers associations and water users associations. The Project also strengthened the national capacity in the PCs to implement multiple Multi-lateral environmental agreements. The three participating countries under SPACC have to report about the conventions on climate change, biodiversity and desertification. The reporting methods, the type of data required and the level of detail is different for each convention, and the PCs have found themselves struggling with the amount of data and effort needed when preparing their reports. The reduction of this burden was originally a very thorough and comprehensive component of the project, but IUCN's withdrawal created an impact on the planned activities. However, under these circumstances, SPACC followed a simplified approach through which specific support was given to each of the PCs by preparing a tool that facilitates the reporting process by identifying and sharing information common to the three conventions.

71. The Project directly contributed to improve National Park management in Dominica with reviewed plans, creation of databases and provision of meteorological data, which is an essential input to ongoing modeling and downscaling efforts. The meteorological stations installed in both National Parks are operating and collecting a comprehensive set of meteorological parameters that are transmitted in real time via cell phone connection. The information can be downloaded at site using a laptop or retrieved remotely from the headquarters of the Forestry Department (which is the responsibility of parks' management) and from the National Meteorological Service of Dominica using a dual communication technology. Finally, there are regional efforts to incorporate this information to better describe regional climate variability and CC trends. The system created by the project is today a node of the Caribbean Hydrological Cycle Observing System (CIC/CARIB-HYCOS) which is a project sponsored by WMO and covers 11 countries. In Saint Vincent, the experience gained with the desalination plant, which was the

first government owned plant in the Grenadine islands, has been decisive at initiating the provision of fresh water to the Grenadine islands. This is the first initiative of its kind on any Grenadine island. Further, the photovoltaic panels installed (80 kW) represent the largest installation in the country, and VINLEC is gaining crucial experience, as stated by their own managers, given current plans of the company to support and foster photovoltaic systems in the country. A power purchase agreement, the first of its kind, is being designed, through which VINLEC will buy the energy provided by the system.

(c) Other Unintended Outcomes and Impacts

72. In Saint Lucia, where supplying water to a growing population is becoming a challenge as there is a lack of conservation measures. For the first time the private sector has been involved in the rain harvesting initiatives. In Saint Vincent, a power purchase agreement has to be designed and implemented. It will be the first of its kind in the country, and the government has requested Bank support on how to craft it. In Dominica, the irrigation pilot will be operated by a water user's association. This will be the first such association in the country, and the Project has had a positive impact on the design and implementation of such association.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

73. There was no formal beneficiary survey held during the Project. With respect to stakeholder workshops, several have taken place, with the objective of sharing experiences and lessons learned during the implementation of the different pilots. For example, under Component 3, a senior consultant, with extensive experience in the three Rio conventions, was hired in order to define strategies to simplify and integrate reporting procedures. The consultant travelled to the three participating countries, provided targeted training and harmonized procedures within each country. The process culminated with a regional workshop that took place in St. Vincent on July 13-14, 2011. As a result of the workshop a report was produced reflecting the opinion of the participants regarding the usefulness and applicability of the report prepared by the consultant as an operational tool. Saint Lucia has also organized a number of workshops to showcase and disseminate the experiences gained during the implementation of its pilots. In Saint Vincent, the renewable energy source initially selected was a wind turbine. Under this framework, extensive surveys and several meetings took place in order to hear the opinions and feedback from the communities surrounding the turbine. Concerns, especially related to its visual impact and the potential noise production, were expressed by the local population. The renewable source finally chosen was solar power, and thus these concerns ceased to exist.

4. Assessment of Risk to Development Outcome

Rating: Moderate

74. Overall, the Project's objective remains highly relevant. Nonetheless, there is still a moderate level of risk and this section examines the potential factors that might hinder the Project's PDO/GEO outcomes from being fully achieved and maintained.

75. **Sustainability of Project investments:** The Project was designed around several pilot activities that aimed at testing and showcasing sustainable solutions to climate change impacts. The Saint Vincent and the Grenadines pilot is a good example. The population served by the desalination plant that has been installed by the Project on Bequia Island, had no other source of water than rainfall. With drought period becoming apparently longer, their water supply was imperiled, and Bequia has been forced to buy large water volumes from barge ships from mainland Saint Vincent to cover the shortages. These drought situations have created certain levels of social disorder and have resulted in high costs for an already strained population. The desalination plant will provide potable water taking as its input sea water, and will be powered by a renewable energy source, photovoltaic panels, which provide more energy than that

demanded by the plant. This creates excess electricity that can be sold, and revenues can cover the operation and maintenance of the setup. Solar energy also allows Bequia to have an alternative source of power other than diesel (all of the island's supply was based exclusively on diesel generation), which reduces the shocks on the local economy caused by variability of oil prices.

76. The Saint Lucia investments in rainwater harvesting and wastewater treatment for a large hotel facility are strengthening the sustainability of large touristic infrastructures in the Caribbean, which is critical for the economics of the region. Through the collection, storage and use (on non-human consumption-related purposes) of rainwater, it has been proven that a large rainwater infrastructure can significantly reduce its consumption, reduce its intake from the water supply company and thus release a significant quantity of potable water for other purposes. The wastewater treatment solution, based on ad-hoc treatments followed by garden irrigation, has proven effective in both reducing organic loads into natural areas and also creating a benefit for the touristic industry, thus ensuring its replication and maintenance.

77. Dominica's activities combined represent an approach to ensure greater sustainability of its National Parks, which were threatened by anthropogenic encroachment of farmers as well as by climate change impacts. The new irrigation system improves agricultural output within each farm, and prevents farmers from abandoning their areas and thus their moves into the Parks. The knowledge activities (meteorological stations, Park management plans, databases) are targeted at mainstreaming climate change considerations into Government's actions and decisions.

78. **Macroeconomic and Fiscal Vulnerability:** Overarching macroeconomic and fiscal vulnerability remains a key risk in all participating countries. Project resources were committed at the time of appraisal but implementation of the Project proved to be complex and ambitious given the funds available. The Small Island Developing States (SIDS) economies remain highly vulnerable to external fluctuations and natural hazards. In effect, the capacity issues, financial weaknesses and implementation risks were identified at the time of the appraisal to a great extent. However, it was not anticipated how badly the 2008-09 financial crises and the decline of the US and European economies would affect tourism in the small OECS island countries and productive activities, and the long-term impacts thereof.

79. **Mainstreaming climate change issues in the productive sector is not always a priority:** Despite the adoption of the integrated ecosystem approach that highlights the benefits accruing to the islands and given the priority of the selected pilot sites, it is possible that policy makers will not give enough attention to the issue. However, part of CCCCC's mandate is to ensure that the linkage between climate and policy remains at the center of discussions on climate change. The CCCCC will continue to be involved in the process of mainstreaming of climate issues into policy. Furthermore, the upcoming PPCR Project will also ensure that the climate change dialogue is maintained, with a special focus on disaster risk management and reduction. This approach is very relevant on a region prone to natural disasters, and is seen as a way to increase interest and engagement from Governments.

80. **Management capabilities and technical competency:** The Project provided sustainable training and resources for materials related to climate change activities, but more attention has to be paid to management capabilities and technical competency in the agencies involved in the implementation, which are critical to the sustainability of outcomes and benefits development. Technical staff from the ministries involved in the pilots suffered from changes in governments, which in turn affected the staff in the appropriate institutions involved in the Project activities. During the implementation of the Project, technical capacity proved to be a challenge, both with respect to CCCCC and at country level. In the future significant technical support would be required from the implementing agency and the counterparts at the country level.

5. Assessment of Bank and Borrower Performance

(a) Bank Performance in Ensuring Quality at Entry Rating: Moderately Satisfactory

81. Project preparation and design followed Bank guidelines and was based on previous experiences gained from MACC, CPACC and other related programs. However certain shortcomings including: lack of specific detailed pilot activities; lack of clear national counterparts with the experience to ensure proper execution at the local level; and an implementing agency that did not have enough control mechanisms to coordinate activities in sovereign countries, led to the restructuring of the Project after the mid-term review. During Project execution the organization and management with country counterparts proved to lack clear decision authority, particularly in the case of St. Vincent and Dominica. As in the case of St. Lucia, the problem was generally overcome due to the management skills of the Project coordinator. Technical capacity was challenging both with respect to CCCCC and country level support; and the level of funding proved to be insufficient, in part due to the international financial crisis that affected some of planned activities.

82. However, this was one of the first Projects with real on-the-ground investments, actions and pilot interventions. At the time of Project design, plenty of the information needed to undertake these investments was still unknown, and there was no previous experience on climate change adaptation investments on infrastructure in the region. Even with these constraints, there was a continued commitment from the GEF and the Bank to finance interventions that have helped put an emphasis on the importance of adapting to climate change, focusing on the natural resources base of the islands and extracting lessons for similar investments elsewhere. In this respect, SPACC has been an innovative Project that has been able to complete most of the activities it was set out to do.

(b) Quality of Supervision Rating: Moderately Satisfactory

83. *Overall the Bank supervision throughout the life of the Project was moderately satisfactory.* The Bank conducted regular supervision missions to the participating countries focusing primarily, throughout the period of the implementation of the Project, on progress towards results. During the first four years of the Project implementation, the missions concentrated on the original eight monitoring indicators. After the restructuring of the Project in September 2010, the missions focused on progress made towards results of the fifteen monitoring indicators. The new indicators brought value to the Project, since they helped frame the outcomes, concretize activities, and improve supervision and monitoring. Bank activities also included coordination amongst actors and technical support to CCCCC during Project implementation.

84. *Responsiveness to implementation problems was slow at first.* Especially in the first four years of the Project, Bank responsiveness to implementation constraints was sluggish. Supervision missions identified problems such as: complex implementation process consuming a lot of time, resulting in delays in execution and implementation; under-funding with respect to implementation and supervision requirements given the diverse nature of the Project activities (technically and geographically); and the small size of the Grant, where the allocation of funds does not reflect the level of effort required to run a technical Project in three countries over a five year period. The financing difficulties of the Project did not come all at once, and it became challenging to take a decision on which activities to maintain and which ones to reduce. Once the full picture was clear, the team conducted an in-depth mid-term review, the Project was then restructured, and disbursements increased significantly afterwards. This led to the project being able to achieve most of its goals. During this time, the Bank team coordinated with multiple phone calls, videoconferences and missions.

85. *There were delays falling outside the Project's capacity to respond.* These related primarily to the lack of clear decision making structures in participating countries and reduced technical capacity, and most importantly, to elements requiring national policy and land acquisition issues that had to be resolved prior to execution.

86. *Supervision was responsive to Project issues:* Despite the fact that the Bank team's continuity and regularity of missions were somewhat affected by the change in staffing, including task managers over the Project life, a successful restructuring was conducted, and changes were introduced towards implementation success. The Project achieved substantial progress in all components, partially due to the conclusion of designs and quick transition towards procurement and execution. Following the MTR the ISRs include a reasonably good description of issues and progress, also detailed in Aide Memoires, particularly the one of August 2011 where there is a full analysis of the overall status of Project activities in each one of the participating countries and a discussion of an action plan to finalize Project activities by December 2011.

(c) Justification of Rating for Overall Bank Performance

Rating: Moderately Satisfactory

87. Overall Bank Performance is rated Moderately Satisfactory based on similar ratings for Bank performance in Ensuring Quality at Entry and in Quality of Supervision.

88. The Bank effort applied to this Project in the initial preparation process was considerable. Much of the Project design was based on international perceptions relating to climate change adaptation activities. The Project objectives were highly relevant to the Region and focused on pilot activities designed to address issues on a national scale. At the supervision level, initial slow Bank responsiveness to addressing implementation delays in several activities was compensated by the changes introduced after the MTR, improving implementation progress; and the six month Project extension was instrumental in helping to complete all activities. The SPACC Project not only had the difficulties of being the first of its kind implementing on-the-ground adaptation to climate change investments, but it also suffered from the natural hardships of a regional Project, involving multiple counterparts, stakeholders, agencies and beneficiaries. These two features require very intense supervision and follow-up, challenging task given the overall funding available for the Project. Despite these difficulties, the Project managed to deliver in most fronts, and has proven to be a valid tool to strengthen the dialogue in the region and leverage more funds and initiatives such as the PPCR. For these reasons, the Bank's overall performance is rated as moderately satisfactory.

5.2 Borrower

89. The Borrower for this Project is CCCCC, which implemented activities in the name of and on behalf of the three participating countries.

(a) Government Performance

Rating: Moderately Satisfactory

90. In the case of St. Lucia the rating is satisfactory. The country maintained a national technical coordinator throughout the life of the Project, and the national government was engaged and committed. The engagement with Dominica can be seen in two stages. During the first years of Project implementation, the main focal point was the Environmental Coordinating Unit within the Ministry of Environment. During this time, the Project lacked a clear focus and progress was slow. In early 2010, the CCCCC hired a consultant who was sent to Dominica in order to expedite activities. The consultant proactively engaged with the Ministry of Agriculture and Forestry, which committed to implement

activities, appointed a focal person to manage SPACC in the country, and vigorously supported the Project. Finally, Saint Vincent and the Grenadine's focal point for SPACC was the Permanent Secretariat from the Ministry of Health and the Environment. This Ministry suffered a number of staff changes, and progress was uneven. The desalination plant pilot encountered a number of complications, especially during the time when the wind turbine was explored as the first option (acquisition of lands required, construction of an access road etc) which slowed down progress. Some of these complications fell beyond the attributions of the Ministry, and the Project suffered delays. Once the final decision on photovoltaic power was taken, and the procurement processes started, all country agencies came on board and activities accelerated considerably.

91. Main overall shortcomings, which can be seen as lessons learnt, are: (i) At the Project preparation stage the main problem was the reliance on a regional executing agency without clear national counterparts empowered with the knowledge and experience to ensure proper execution at the local level; (ii) At the implementation stage, although the Grant Agreement established that participating countries should provide resources for national coordination, this did not occur mainly due to the international financial crisis, with the exception of Saint Lucia. With respect to critical decisions required to ensure the success of the Project, the participating agencies had no clear mechanism for arriving at definitive decisions and binding agreements; and (iii) several of the Project activities imply infrastructure interventions, and the focal points chosen for SPACC not always have the attributions to mandate and coordinate works. This in turn created some level of detachment from Project activities, especially during the first years of implementation. Government involvement and commitment however increased as soon as goods and works contracted by the Project started to become a reality.

92. All Ministries of the three countries participating in SPACC, all incumbent agencies, meteorological services and other bodies that needed to play a role for Project implementation, were responsive and made time and resources available for Project completion, as demonstrated by the engagement of entities, VINLEC and CWSA, energy and water supply authorities of Saint Vincent. Overall government commitment was critical to ensure appropriate Project completion; and this commitment continues after Project closure, as demonstrated by the wide engagement of the three countries with the PPCR project.

(b) Implementing Agency or Agencies Performance

Rating: Moderately Satisfactory

93. The implementing agency for this Project was the Caribbean Community Climate Change Centre. The implementation responsibilities were identified in the Grant agreement between the CCCCC and the Bank, while responsibilities assigned to participating countries were agreed to between CCCCC and the countries through specific Participation Agreements. The expected results as well as the specific activities were identified and broadly defined in the Grant Agreement, while the specific details were left to be developed during the execution of the Project. This process involved a screening procedure for the identification and selection of specific interventions requiring high involvement, engagement and leadership from the implementing agency, almost permanent presence in the field, and high convening power to bring all stakeholders to the negotiations table and agree on activities, responsibilities and policy changes needed. This proved to be a burdensome undertaking for a relatively young and small implementing agency.

94. Additionally, as required under the Grant Agreement, individual countries were to provide direct financial support. The level of support was identified in the Grant Agreement and the expectation was that in addition to a national coordinator, countries would provide financial resources. Despite these efforts during the restructuring of the Project to allow for in-kind contributions, the fact remained, with the exception of Dominica, that the lack of direct national financing into activities prevented a higher sense of

ownership to develop, which played against Project agility and more efficient implementation. The CCCCC made remarkable efforts to step up and cover financial shortages, and was proactive in identifying a new, experienced project manager for SPACC who accelerated the pace of implementation and improved coordination efforts. It has to be noted that most of the activities have been completed despite the numerous challenges, and this has been possible to great extent thanks to the continuous commitment of CCCCC with the Project and its determination to achieve appropriate implementation.

95. The assessment of the “Borrower/Recipient” performance is a complex task, and while trying to evaluate only the work done by CCCCC, this has to be seen in the context of the actual capacity and performance of three totally different countries engaged in the implementation of totally different type of pilots and activities.

(c) Justification of Rating for Overall Borrower Performance
Rating: Moderately Satisfactory

96. Overall Borrower Performance is rated Moderately Satisfactory, based on ratings for Government Performance and Implementing Agencies’ Performance. Certainly without sustained high level Government commitment and support to the Project none of the achievements of the SPACC program would have been feasible. In terms of the implementing agency, overall management of Project activities was moderately satisfactory, with CCCCC complying with procedures; close supervision of national/local level activities; important technical assistance to national/local entities; and timely reporting. However, as explained earlier in this report, the Project has suffered important delays from a number of sources and unfortunately, resources for CCCCC project management were scarce. The Project would have likely benefited from a one-year extension, and the possibility was discussed during the restructuring process. Unfortunately, there were not enough Project management resources left for such an extension, and therefore a six-month extension was agreed upon and executed.

6. Lessons Learned

97. Some lessons learned from SPACC are as follows:

98. *Early engagement of the user community:* Early engagement of the user community during the preparation of the pilot projects had a significant and positive effect on the execution of the pilot scale activities. This participation served to maintain the visibility of the projects from the government perspective and their early inputs aided in the design and execution of effective pilot designs. This was particularly effective in the case of the Bequia desalination plant and the irrigation works in Dominica.

99. *Strong engagement of private sector participants:* In the pilot rainwater harvesting effort on St. Lucia, the identification and engagement of a motivated private sector partner was critical to the success of the demonstration project. Hotel participation was robust and their contribution both in support for the pilot as well as their willingness to engage other hotel owners provided for the successful implementation of the conservation strategy, and turned into a vehicle for educating others in the hotel sector about the benefits of rain-water harvesting.

100. *Selection of a motivated regional counterpart:* While CCCCC was relatively inexperienced in the management of a project of this nature, their regional presence and strong motivation to produce a successful project was a significant factor contributing to a satisfactory project. Despite limitations of funding for Project supervision, CCCCC used their regional presence to engage additional monies to cover shortfalls.

101. *Robust institutional arrangement, documented in an operational manual, is vital to ensure effective implementation:* While regionally, CCCCC managed the operational aspects of the Project, local counterparts consisted of multiple agencies operating through country coordinators. This organizational structure left much of the responsibility for execution with a coordinator that had no authority to direct agency participation. As such, the coordinator had to rely on negotiated commitments with line agencies which varied from country to country. Absent clear lines of authority and responsibility, Project activities suffered delays and setbacks. Notably, in the case of St. Lucia, Project activities moved well because of private sector participation and the skill of the project coordinator with involving and motivating participating agencies. It was noted however, that particularly in the case of the community center retrofitting, the absence of a clear management structure empowered with appropriate authority created challenges with the implementation of works.

102. *An institutional capacity assessment and policy framework should be the point of departure to achieve an adequate design:* Pilot projects such as the desalination plant and irrigation works in Dominica required the development and implementation of policies and procedures that required government action, and in some cases at the cabinet level. In St Vincent, the desalination plant design included the generation of solar power to both run the plant and generate excess power to be sold back to the national electric authority (VINLEC). Revenues generated from the sale of power were included in the pilot concept as a revenue source for plant maintenance and operation. St. Vincent lacks a national policy for purchasing excess power and such a decision requires the analysis of VINLEC's cost structure and the development of appropriate tariffs which require cabinet approval. At the moment, VINLEC is in the process of designing the agreement, which will likely set the stage for future agreements in the country.

103. *Lessons learnt have been mainstreamed by each participating country.* Saint Lucia has used both pilots to shape regulations and include new requirements when building infrastructure in the country. The experience they have gained through SPACC has been critical in informing the higher level decisions that have been taken; Saint Vincent has also used the experience gained with SPACC to promote solar energy in the island and gain insights on how to make this process more efficient, and they have started the supply of fresh water to the Grenadines. One of the lessons they have extracted is the necessity to have clear regulation on power purchase agreements for the electricity utility to buy energy off from private producers. In Dominica, the irrigation pilot has generated lessons on how to implement infrastructure for a community of water users, since this has been one of the first projects of its kind developed by the Agriculture Ministry in consultation with communities. Although SPACC is a regional project, there are lessons from adaptation to each national context and dissemination to the wider Caribbean. As such, a lesson learnt is the need to provide more funding and efforts towards knowledge management of the activities performed, and a coherent, integrated monitoring system with appropriate funding.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

104. *The following comments are a summary of the ICR prepared by the Implementing Agency on May 15, 2012 and provided by Mr. Earl Green, Task Manager of the SPACC within the Caribbean Community Climate Change Centre (CCCCC).*

105. In the opinion of the CCCCC the Project objective remains valid. The link between the adverse impacts of climate change and development has been well established, and as a result, the topic of adaptation to climate change has become increasingly important in the regional and national agendas. The implementing agency believes that the objective, design and implementation of the SPACC Project have been fully consistent with the region's development priorities, GEF priorities and Bank country assistance strategies. Despite constraints and issues, the SPACC has been able to achieve some successes, and has made positive contribution to conservation and sustainable development in the participating countries.

106. According to CCCCC the main Project achievements can be summarized as follows: policy change for infrastructure development in at least one of the countries, and incorporation of climate change adaptation measures for national parks in another; enhancement of the capacity of national parks managers to monitor weather changes; improved livelihoods of community farmers by reducing their vulnerability to climate variation through the installation of an irrigation system under local management; greater protection of local residents from severe storm events through the provision of a self-contained community centre in one PC; demonstration of effective public-private partnership in addressing a water demand issue affecting the residents of a coastal protected area in one participating country; provision of a renewable energy powered reliable safe potable water supply to residents of a community that previously relied on rainwater collection; introduction of a tool to facilitate reporting and management in the three PCs; and collaboration among different ministries in one participating country in order to implement the pilot projects successfully.

107. The institutional arrangements for Project coordination and implementation at national levels were not all put in place and functioned differently in each participating country. One country, St. Lucia, was particularly effective and exemplary in collaboration and coordination among the national institutions, including the allocation and utilization of counterpart funds for the execution of the pilot activities. The others demonstrated less than satisfactory support for the implementation of the pilots. With respect to efficiency and quality, Project staff members in St. Lucia performed excellently, in SVG performance could be rated as satisfactory, while in Dominica the lack of support of the appropriate institution was less satisfactory.

108. The CCCCC assessment of SPACC concluded that: (i) Project design requires some flexibility to allow for adjustments when social and economic conditions change significantly, being critical to place more emphasis on assessments of the social and economic benefits of natural resources management; (ii) projects that involve a large number of actors (three donors, one regional implementing agency, three participating countries and several governmental partners in each country) need to begin with an initial phase that is devoted not only to Project planning, but to public relations to avoid a disconnect between design and implementation; (iii) projects that demand significant contributions from national and local partners should also provide alternatives for funds when unexpected events affect the countries; (iv) the SPACC experience gained and the lessons learnt can be used in the replication of the projects at larger scales; and (v) climate change adaptation is a long-term venture, whereas many years of continuous work are required to ensure the sustainability of successful adaptation pilot projects.

(b) Co-financiers

N/A

(c) Other partners and stakeholders

N/A

Annex 1. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending and Supervision/ICR			
Javier Zuleta	Sr Water Resources Mgmt. Spec.	LCSEN	Task Team Leader
Walter Vergara	Lead Chemical Engineer	LCSES	Task Team Leader
Daniel Mira-Salama	Environmental Specialist	LCSEN	Engineer / Environment
Diana Cortijo	Administrative Officer	WBGSA	Procurement Specialist
Gustavo Castro F. Raposo	Finance Analyst	CTRLN	Finance Analyst
Cidalia Brocca	Finance Analyst	CTRLN	Finance Analyst
Yingwei Wu	Senior Procurement Specialist	LCSPT	Procurement Specialist
Patricia De la Fuente H	Senior Financial Officer	CTRLN	Financial Management
Joseph Kizito Mubiru	Sr Financial Managt. Specialist	LCSFM	Financial Management
Edith Ruguru Mwenda	Senior Counsel	LEGAF	Sr Counsel
Alonso Zarzar Casis	Senior Social Scientist	LCSSO	Social Sector Specialist
Keiko Ashida Tao	Operations Analyst	LCSEN	Operations Analyst
Emmanuel N. Njomo	Consultant	LCSFM	Financial Management
Judith C. Morroy	Consultant	LCSPT	Procurement Specialist
Alejandro M. Deeb	Consultant	GFDRR	Environment Specialist
Seraphine M. Haeussling	Consultant	LCSEN	Environmental Economist
Carla Della Maggiora	Consultant	LCSEN	Environment Specialist
Ana B. Iraheta	Language Program Assistant	LCSEN	Program Assistant

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
FY05	1.78	13.71
FY06	10.60	72.27
FY07	5.61	25.85
FY08	5.00	16.74
Total:	22.99	128.57
Supervision/ICR		
FY07	9.97	33.18
FY08	11.54	59.21
FY09	7.95	62.93
FY10	9.74	73.84
FY11	9.37	72.35
FY12	7.19	60.89
Total:	55.76	362.39

Annex 2. Implications of Climate Change for Economic Activity in Caribbean Countries

Resource Vulnerable to Climate Change	Potential Effect of Climate Change	Sectors at Greatest Risk	Economic Relevance
Freshwater availability	Changes in rainfall distribution and reduced precipitation; increased evaporation and saline intrusion from sea-level rise	Water resources, tourism, agriculture and forestry	Water supply is anticipated to be a bottleneck for economic activity and a serious health concern. All water-using sectors would be affected.
Degradation of marine and coastal ecosystems	Sea-level rise and changes in sea temperature can affect important ecosystems such as mangroves, fishing grounds, and coral reefs.	Fisheries and tourism	Fisheries account for a sizable share of GDP. Tourism accounts for up to 83% of GDP and is highly dependent on the marine ecosystem.
Land flooding	Sea-level rise will result in flooding of coastal areas. Increased precipitation intensity will cause river floods and landslides	Tourism, agriculture, and forestry	Most tourism activities are located in the coastal zone. Significant capital investment assets and infrastructure could be affected. Interruption of irrigation services and destruction of crops and agriculture infrastructure
Impacts on land ecosystems	Climatic extremes. Heavy rainfall increases the potential for pest and diseases and causes excessive soil erosion. Drought conditions affect productivity, as the plants do not yield their optimum production.	Agriculture	In St. Vincent and the Grenadines, Census figures for 2000 show that 60% of the population is involved in agriculture occupying 43% of the land mass
Increased climate variability	Climate change may increase extreme events such as precipitation intensity, tropical storms, or droughts.	Multi-Sector	The cost of hurricanes and other Natural disasters in the Caribbean region have been estimated at several hundred million dollars over the past decade. These costs continue to increase.

Source: Commonwealth of Dominica, Saint Lucia and St. Vincent and the Grenadines through the Caribbean Community Climate Change Centre for an Implementation of Adaptation Measures in Coastal Zones Project August 8, 2006

Annex 3. Restructured Outcome Indicators, Activities, Costs and Financing.

Change in Outcome Indicators: The restructuring included the revision of indicators to demonstrate more measurable and meaningful outcomes of pilot activities. Moreover, two outcome indicators were dropped due to the cancellation of the two pilots in St. Vincent and the Grenadines. There were no changes in institutional arrangements or in the financing mechanism.

Modifications to the Project Activities in St. Vincent and the Grenadines: Two of the three originally selected pilots in St. Vincent and the Grenadines (Union Island under Subcomponent 6 of the Project, and Spring Village under Subcomponent 7) were canceled, thus reducing the total number of project pilots from seven to five. The number of pilots in St. Lucia and Dominica remained the same.

Project costs and financing plan: Table 1 summarizes the changes in Project costs that were included as part of the restructuring, and Table 2 presents the Revised Financing Plan. The total Project costs were reduced from the initial \$5.44 million to \$4.30 million. This reduction mainly came from: (i) a reduction in the contribution of the Meteorological Research Institute (MRI) of Japan (initially estimated at 1.39 million) estimated at 0.6 million; (ii) the unexpected financial difficulties of the International Union for the Conservation of Nature (leading to the cancellation of US\$125,000), and (iii) decreased governments' co-financing, from an initial US\$1,500,000 to a final US\$850,000.

Table 1: Revised Project Costs (US\$M)

Component	Government		Other donors ⁽¹⁾		GEF			Total	
	Original	New	Original	New	Original	New	Actual Disbursement	Original	New
Component 1: Identification, evaluation and establishment of priority adaptation measures	0.50	0.21	0.79	0.65	0.20	0.37	0.35	1.49	1.23
Component 2: Implementation of adaptation measures	0.25	0.49	0.60	0.25	1.50	1.44	0.03	2.35	2.18
Component 3: Strengthening of national capacity to implement multiple MEA obligations with an integrated and holistic operational framework	0.45	0.00	0.13	0.00	0.20	0.08	0.02	0.78	0.08
Component 4: Project management	0.30	0.15	0.32	0.45	0.20	0.21	0.15	0.82	0.81
Total Project Cost	1.50	0.85	1.84	1.35	2.10	2.10	0.55	5.44	4.30

(1) Includes extra funds from the CCCCC and others, as reflected on Table 2.

Table 2: Revised Financing Plan (in US\$ million)

Source	Local	Foreign	Total
Borrower	0.85		0.85
Dominica	(0.14)		
St. Lucia	(0.19)		
St. Vincent and the Grenadines	(0.52)		
GEF	0.43		2.10
Others	(0.32)	2.10	1.35
CCCCC	(0.10)	0.92	
SL CCBRAS	(0.01)		
SV Fish Complex			
MRI		(0.6)	
Italy		(0.32)	
Total	1.28	3.02	4.30

Reallocation of GEF resources: Participating countries' difficulties in allocating cash funds created the need to partially reallocate funds from GEF. The following reallocation of GEF resources took place from Component 2 (Implementation of the pilots) and Component 3 (Strengthening of national capacity to implement multiple Multilateral Environmental Agreements) to Component 1 (Design of the pilots) and Component 4 (Project management).

- Component 1: The increase in resources for this component arose from unforeseen increases needed for some critical design studies, especially the study related to the intensification of hurricanes and its impact on building codes for the Marchand building in Saint Lucia.
- Component 2: The reduction in resources for this component amounted to US\$50,000 that was allocated to other activities. This amount was less than 5% of the total grant amount, which complied with Bank's operational policy 13.25.
- Component 3: The re-definition of this component after the withdrawal of US\$125,000 from the International Union for the Conservation of Nature, IUCN, together with their leadership and support, due to their own financial crisis. The component was reduced in scope, and contracted experts and conducted workshops to support countries prepare a single integrated reporting framework for the three Rio conventions. The Project team estimated that this plan could be accomplished with US\$75,000 and the countries agreed on this approach.
- Component 4: It was proposed that the GEF allocation for Category 4 (Project management) be increased by US\$10,000 due to the aforementioned participating countries' difficulties to allocate cash resources for Project management and the need for more intensive coordination and management between the CCCCC and the national coordinators/focal points, in light of the complexity of a regional Project. The CCCCC also used its own resources, from allocations received from third parties, to meet additional costs associated to Project management.

Table 3: Reallocation of GEF Grant and Modifications to Eligible Expenditures

Category by component (1)	Original Allocation	Approved Allocation	Difference	Percentage of Expenditures to be Financed (inclusive of Taxes)
(1) Goods, consultants' services, <u>and workshops</u> for Component 1 (identification, evaluation and establishment of priority adaptation measures), with the exception of the provision of climate change projection data (1.1.b), and establishment of cooperation agreements (1.2.e)	200,000	365,000	+165,000	100%
(2) Goods, works, consultants' services, <u>and workshops</u> for Component 2 (implementation of adaptation measures), with the exception of in-country coordination efforts for implementation (subpart 2.1)	1,500,000	1,450,000	-50,000	100%
(3) Goods, consultants' services, <u>and workshops</u> for the development and testing of a harmonized reporting framework (<u>subparts 3.1 and 3.3</u> of the project) in Component 3	200,000	75,000	-125,000	100%
(4) Goods, consultants' services <u>and Operating Costs</u> under Component 4 Part 4 of the Project	200,000	210,000	+10,000	100%
TOTAL AMOUNT	2,100,000	2,100,000	0,0	

(1) The description of each category already includes some of the modifications presented below.

Financial management: Two financial management supervision missions were carried out as part of the MTR (July and September 2010). They showed that financial management arrangements continued to be adequate on the whole, and the Bank and CCCCC agreed on actions to address issues that arose from those missions. There were no overdue audit reports.

Disbursement arrangements: The disbursement schedule was updated to reflect the delays in the implementation of the pilots:

Fiscal year	2007	2008	2009	2010	2011	2012
Original	0.25	0.70	0.80	0.35	0.00	0.00
Revised	0.21	0.13	0.25	0.12	1.29	0.10

Procurement: Procurement under the Project was rated satisfactory.

Closing date: The mid-term review included a six-month extension of the Project. A one-year extension was considered, but there were insufficient funds under Project management (component 4) to provide for the extra resources that would have been needed.

Annex 4. Results Framework Matrix

Original Outcome Indicators	Revised Outcome Indicators	Baseline	Status at Mid-Term Review (September 2010)	Expected Outcome at End of Project	Status by end December 2011
<p>Dominica</p> <p>1. Ecosystem functioning in Morne Diablotin and Morne Trois Pitons National Parks in Dominica is preserved (measured through the stabilization of the population of key flagship species, such as the stabilization of 135 pairs of nesting parrots that are affected by climate change impacts).</p>	<p>1. At least one Park Management Plan (including a land use plan for buffer areas) updated and submitted to Cabinet for approval by the Ministry of Agriculture and Forestry, incorporating climate change considerations for the Morne Diablotin National Park and/or the Morne Trois Pitons National Park in Dominica.</p> <p>2. Ministry of Agriculture and Forestry creates and maintains a comprehensive database of key ecological variables useful for Park Management</p> <p>3. The Ministry of Agriculture and Forestry installs at least one new meteorological station in each of the two Parks and uses information from them for National Park management and/or agriculture planning.</p> <p>4. The Ministry of Agriculture gains capacity to manage water stresses related to climate change on agriculture through the extraction of useful lessons (evidenced by the publication of at least one Technical Note and the implementation of at least one workshop for government, private sector, and non-profit stakeholders in Dominica) from an irrigation pilot for the communities of Colihaut, Dublanc and Bioche.</p>	<p>Existing Management Plans dated MTPNP/2002–2012 prepared in 2001; MDNP/1993–2003 dated 1993. (No Climate Change considerations).</p> <p>No systematic information on ecological variables available</p> <p>No meteorological data stations available inside the parks</p> <p>Non-irrigated agriculture highly vulnerable to water scarcity issues. No irrigation project lead by Government has been developed in Dominica.</p>	<p>Existing Management Plans updated with USAID support. (No CC considerations included)</p> <p>Collection of field work data underway</p> <p>Caribbean Institute of Meteorology and Hydrology CIMH hired to prepare data needs assessment</p> <p>Feasibility study for irrigation pilot being hired</p>	<p>Adaptation measures to lessen anthropogenic pressure on park lands identified and incorporated in parks management documents. Cabinet paper prepared by the GoD seeking approval of the Revised Management Plans.</p> <p>Database compiled and available for the ministry of agriculture and the forestry division</p> <p>One station in each park has been installed, and the Ministry of Agriculture and Forestry division have online access to the data generated.</p> <p>Irrigation pilot designed and implemented in the Milton area. Ministry of agriculture has supported the design and implementation, and coordinates the execution and dialogue with farmers.</p>	<p>Achieved The Park Management Plan for MTPNP has been extensively reviewed & for MDNP has been updated and climate change issues added. Both are under review of the Secretary of Agriculture prior to submission to the Cabinet for approval</p> <p>Achieved A comprehensive database has been prepared by the Ministry of Agriculture and delivered to AICTU</p> <p>Achieved The two meteorological stations have been purchased and installed, as part of ongoing CARIB-HYCOS Project covering the Islands States, and information is being collected.</p> <p>Achieved The Ministry of Agriculture has developed a pioneer irrigation pilot in the Milton area. During its implementation workshops and meetings were held with beneficiaries, private sector and other stakeholders.</p>

Original Outcome Indicators	Revised Outcome Indicators	Baseline	Status at Mid-Term Review (September 2010)	Expected Outcome at End of Project	Status by end December 2011
Saint Lucia					
<p>1. Health of coastal ecosystems in the Vieux Fort area (measured through the stabilization of the area, density and productivity of 60 ha of coastal mangroves in Mankote/Savannes Bay) that are being affected by climate change and other sources of stress, are stabilized.</p> <p>2. Lessons from strengthening of key infrastructure incorporated into local hazard management plan and building guidelines in St. Lucia.</p>	<p>5. Results from the implementation of the Vieux Fort rainwater harvesting and waste water treatment pilot documented and disseminated by the Ministry of Physical Planning and Environment through the publication of at least one technical note and the implementation of at least one workshop for government, private sector, and non-profit stakeholders in St Lucia.</p> <p>6. Vieux Fort rain water harvesting system reduces the consumption of 3,000 cubic meters per year of potable water from the water utility.</p> <p>7. The Ministry of Physical Planning and Environment submits for Cabinet approval a decree to enforce rain water harvesting on new touristic activities.</p> <p>8. Successful Vieux Fort waste water treatment system contributes to reduce organic load to the coastal ecosystems in the Pointe Sable Environmental Protection Area of St. Lucia by cancelling actual waste water sewerage outflow into the coast.</p>	<p>No rain water harvesting experiences on large infrastructure documented and disseminated</p> <p>Water is being diverted for water supply to a growing population, without water conservation measures. No significant rain harvesting in the area.</p> <p>No legal framework to enforce rain water harvesting exists</p> <p>Waste water produced by the hotel undergoes mild treatment and is discharged at the neighboring Point Sable EPA</p>	<p>Designs finalized, bidding documents under final review</p> <p>Designs finalized, bidding documents under final review</p> <p>Draft decree being discussed within Government</p> <p>Waste water system designed, final bidding documents under review</p>	<p>Works for rainwater harvesting and wastewater treatment finalized, certificates of completion available, information about costs and benefits collected. Technical note elaborated by the Government of Saint Lucia, dissemination of lessons learned initiated.</p> <p>Rain harvesting structures provide at least 3,000 cubic meters of water for the pools and bathrooms of the hotel.</p> <p>Rain harvest-enforcing decree has been submitted to Cabinet for approval.</p> <p>Waste water system functioning, waste water outlet towards Point Sable Area no longer in use.</p>	<p>Achieved</p> <p>The rainwater harvesting experience has yielded many positive experiences, which have been captured in relevant documents by the Ministry of Physical Planning and Environment</p> <p>Achieved</p> <p>Rain harvesting and recycling system successfully finalized. 18,000 & 27,000 liter tanks have been installed with a total capacity of 45m³. These tanks are used daily by the hotel, reducing the consumption from water utility</p> <p>Partially achieved</p> <p>The legal framework to enforce rainwater harvesting on new touristic developments in St. Lucia has been fully prepared. Its enforcement is awaiting a thorough review before the Ministry of Physical Planning officially submits the proposal to the Cabinet. Discussions at national level have been started.</p> <p>Achieved</p> <p>All wastewater produced by the hotel is currently being treated in their treatment plant and subsequently being reutilized for garden irrigation, with no outflow to the coast.</p>

Original Outcome Indicators	Revised Outcome Indicators	Baseline	Status at Mid-Term Review (September 2010)	Expected Outcome at End of Project	Status by end December 2011
	9. Information campaign implemented by the Ministry of Physical Planning and Environment to disseminate the lessons of the Marchand building pilot.	Existing building codes and practices.	New Engineering Building Guidelines completed.	Retrofitting of one vital infrastructure. Cabinet paper for introduction of the New Engineering Guidelines submitted for consideration by the GoSL.	Achieved The Ministry of Physical Planning and Environment has disseminated the experiences gained with the Marchand building pilot. The Marchand building is commonly being used as a flagship experience.
St. Vincent and Grenadines 1. Population of 25 ha of remaining Black Mangrove stands on Union Island (measured through density and productivity) affected by climate change, is stabilized. 2. Bequia Island integrated natural resources management plan, including climate change biodiversity and land degradation concerns finalized, incorporated into national development planning process	<i>Dropped due to the cancellation of this pilot.</i> 10. Institutional viability of the Bequia water desalination and distribution system is demonstrated by an operative and adequately staffed Central Water and Sewage Authority (CWSA) office for the collection of consumer fees and operation and maintenance of the system. 11. Technical viability of the Bequia desalination, water distribution and renewable energy pilot is demonstrated by an operative desalination plant producing 50 cubic meters per day and an operative renewable energy device producing an average of 10,000 kWh per month.	No water fees being collected in the Paget Farm area, water distribution system non existent Water availability constrained to individual storage limited during the rainy season only.	Resources for CWSA to build and operate distribution system already in the National Budget Desalination plant procurement finalized, renewable energy design underway.	Fully operational system, CWSA is collecting fees from consumers. Desalination plant and renewable energy source are fully functional and being operated by the utility companies. Govt. has extracted technical lessons on operation & maintenance of new technology	Achieved The desalination plant is fully operating. CWSA prepared the design of the system and the Government has contributed financially and in kind. CWSA is currently reviewing the financial assessment in order to fix consumer fees for the water. Achieved The desalination plant has been fully installed and commissioned, at the Bequia Fisheries Complex on the Paget Farms community. The plant has been interconnected to the electrical grid, and it has been producing potable-quality water since July 2011. The water production output of the plant is 60m ³ /day.

Original Outcome Indicators	Revised Outcome Indicators	Baseline	Status at Mid-Term Review (September 2010)	Expected Outcome at End of Project	Status by end December 2011
<p>3. Diversity of coral reefs and associated species (measured by number and density of species) in the Spring Village area, affected by climate change and land degradation impacts, is stabilized. Number and density of coral species has not diminished over the Project's lifetime.</p>	<p>12. Financial viability of the Bequia desalination, water distribution and renewable energy pilot is demonstrated by a financing mechanism which includes: (i) tariffs and budgetary contributions that guarantee the operation and maintenance costs for the desalination plant and water distribution system; and (ii) a renewable energy source offsetting the incremental costs of providing power for the desalination and pumping systems</p>	<p>No water desalination for public consumption experience in the island, reduced water connection structures.</p>	<p>TORs for contracting a consultant to perform overall cost-benefit analysis and financial assessment of the pilot being prepared.</p>	<p>The Government has acquired insights on the costs of desalination plus renewable energy combination, CWSA is collecting user fees, the electrical utility (VINLEC) is operating the renewable source and providing the desalination plant with the energy required.</p>	<p>Partially Achieved</p> <p>The financial viability of the Bequia desalination pilot will be covered through the collection of user fees. Additional financing for maintenance will arise from the selling to VINLEC, the Electricity Utility, of excess energy produced by the solar panels. However, the water distribution system is currently being finalized and as such no fees are yet being collected; and the purchase agreement with VINLEC has not yet been concluded as the details are still being defined. <i>Note:</i> An unexpected benefit of the project is the experience gained through the drafting and signing of this purchase agreement.</p>
	<p>13. The Ministry of Health and Environment gains capacity to manage water stresses related to climate change through the extraction of useful lessons (by the publication of at least one technical note and the implementation of at least one workshop for government, private sector, and non-profit stakeholders in St Vincent & the Grenadines) from the Bequia pilot.</p> <p><i>Dropped due to the cancellation of this pilot.</i></p>	<p>No renewable energy source operated by the utilities in the island. Reduced adaptation capacity. Bargaining of water from the government occurs frequently during dry season.</p>	<p>Pilot Project to manage water stresses under implementation.</p>	<p>The Ministry of Health has supported the design and implementation process of the pilot, has been provided with economical and technical information, and has a report on recommendations to replicate the pilot. A workshop has been performed.</p>	<p>Partially Achieved</p> <p>The Minister of Health has been the main counterpart of the SPACC project since project inception. They have devoted part-time staff on a regular basis for the design and implementation of activities, and they have received a report on investment, operation and maintenance costs of the setup. The whole scheme is not yet fully assembled, and therefore a final workshop and technical note are still forthcoming.</p>

Original Outcome Indicators	Revised Outcome Indicators	Baseline	Status at Mid-Term Review (September 2010)	Expected Outcome at End of Project	Status by end December 2011
<p>Global Learning Value</p> <p>1. GEF uses the lessons learned in at least one GEF adaptation project.</p> <p>2. Contributions are made toward better definition of adaptation performance indicators.</p>	<p>14. Lessons learnt by the CCCCC are disseminated through technical notes.</p> <p>15. The University of West Indies receives from the Meteorological Research Institute of Japan useful climate modeling data to enhance its regional climate model and makes use of the results in research and teaching.</p> <p><i>Dropped due to indicator's ambiguity</i></p>	<p>No experience with adaptation measures.</p> <p>No data from MRI available for the university.</p>	<p>Draft technical notes are available</p> <p>Scientists currently in Japan.</p>	<p>At least three technical notes on lessons learned from SPACC disseminated by CCCCC.</p> <p>Two professionals from the University of West Indies have been trained in the use of the Earth Simulator model. Results are used for regional research.</p>	<p>Achieved</p> <p>The CCCCC has prepared notes and posted them in their web pages. Experiences gained through SPACC are being used and scaled up through the larger PPCR program.</p> <p>Achieved</p> <p>The University of West Indies sent two scientists to the MRI at Japan, where they were trained in the use of the Earth Simulator, a supercomputer devoted to climate simulation. Both scientists are teachers of the University, and brought back useful results of the Earth Simulator that are currently being used on a number of initiatives such as additional work towards improvement for climate change models.</p>

Annex 5. Economic and Financial Analysis

The Project was estimated to demonstrate its economic efficiency at three levels: (a) the nature of the project to include pilots provides efficiency because it saves learning costs, evaluates design assumptions, and permits adjustments of the measures before its replication at a national level was being replicated; (b) the preliminary economic analysis of a selected adaptation measure would highlight economic benefits higher than the economic costs of implementing them, as the experience in other adaptation pilots had provided; and, (c) the procurement procedures adopted by the Project would favor minimum cost for significant acquisition of goods and services.

A preliminary economic analysis of selected adaptation measures was to be undertaken to illustrate the economic efficiency of the type of adaptation measures covered by the Project. The analysis was to assess direct economic benefits and costs associated with the adaptation measures applying standard economic methodology. Following previous experiences it was expected that the cost-benefit ratio for each measure will show higher economic benefits than cost in all cases. An incremental cost analysis and an accounting of local and global benefits would also be included. A financial analysis would be conducted as part of the selection process for site specific adaptation measures, which would guide the decision-making process for the identification of appropriate and economic efficient interventions.

Incremental Cost Analysis: As required for a GEF project, at appraisal, an incremental cost analysis was used for the project's economic and financial analysis. The Project objective was to support efforts by the participating countries (Dominica, Saint Lucia and St. Vincent and the Grenadines) to implement specific pilot adaptation measures addressing the impacts of climate change on biodiversity and land degradation along coastal and near-coastal areas. Therefore, the Project components were designed to cover all necessary steps for effective preparation for climate change adaptation: the evaluation design and selection of adaptation measures (component 1), the implementation of pilot adaptation measures covering the main impacts of climate change (component 2), the institutional arrangement necessary to effectively respond to the multilateral environmental commitments (component 3) and the Project Management (component 4). Taking into account that components 1 and 2 were closely related, and that the adaptation measures covers different topics in the participating countries, the development goals and baseline analysis treated both components as one but following the issues covered by the pilot adaptation measures of component 2.

Baseline costs were identified by consulting official investment plans of the institutions included in the Project scope and selecting specific programs and activities that relate with the ecosystem that would be affected by global climate change. Baseline costs for subcomponent 1 and 2 were based on Dominica National Biodiversity Strategy and Action Plan, in particular, allocated resources for the following projects: Integrated Land (Resource) Use Planning and Management (USD 1.5 million), Comprehensive Water Resource Management Plan (USD 750,000) and the Identification and Protection of Threatened Ecosystems and Species (USD 650,000); Baseline costs for subcomponent 3 were based on the National Water Policy of Saint Lucia; and Baseline costs for subcomponent 4 were based on the cost of the approved loan by the Caribbean Development Bank in 2004 to finance appropriate flood mitigation measures in Castries and Anse La Raye (USD\$ 5.45 million). **The total Baseline costs were estimated at US\$10.81 million.**

The Project was expected to provide complementary support to existing and planned (baseline) local activities related with water availability, watershed and coastal management, National Parks conservation, disaster managing and sustainable fishing; and was aimed to achieve global objectives not only relating with the preparation of participating countries on adaptation measures

to cope with the major global climate change impacts on its resources, but also to address the inter-linkages between climate change and biodiversity and land degradation in an integrated manner. The Project also seeks to produce knowledge of global value on how to implement adaptation measures in small island states that can be applied in other countries in the region, not participating in the Project and even for islands in other regions of the world. The value of these early lessons will make the GEF resources applied, more cost-effective in the medium term. The total incremental cost calculated at appraisal was US\$5.4 million, of which US\$ 2.1 million was to be financed by the GEF.

Impact on strategic local resources as well as on strategic global resources: The main global environmental objective was to prepare participating countries for adaptation to the main identified global climate change impacts by assessing, selecting, designing and implementing pilot adaptation measures, with “a learning by doing” approach. In addition to climate change adaptation objective, the Project also would contribute to biodiversity conservation objectives by supporting the design and implementation of specific adaptation measures that will enhance the resilience of vulnerable, globally-important ecosystems and biodiversity. Finally, in the institutional area, the Project would contribute to strengthening the institutional countries capacity to implementation of MEA with an integrated and holistic approach intended to reinforce the multilateral environmental policy in the region.

Annex 6. Beneficiary Survey Results

N/A

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

On behalf of the implementing agency, Dr Kenrick R. Leslie, Executive Director of the Caribbean Community Climate Change Centre (CCCCC), in a mail to the ICR Task Team Leader dated June 11, 2012 expressed its agreement with the content of the Implementation Completion Report and took this opportunity to thank the Bank Team for the very strong support given to the Centre in the successful completion of the project.

Annex 8. List of Supporting Documents

World Bank Documents

- Project Appraisal Document
- Global Environment Facility Trust Fund Grant Agreement
- Implementation Status and Results Reports (ISRs)
- Aide Memoires from Supervision Missions
- Mid-Term Review
- Restructuring Paper
- Caribbean - Implementation of Adaptation Measures in Coastal Zones Project: Environmental Assessment, August 1, 2011
- Implementation Completion and Results Report of the OECS Protected Areas and Associated Livelihoods Project, May 16, 2012

Others:

- Caribbean Islands Component (CIC/CARIB-HYCOS) Draft Project Document
- Support to Natural Disaster Prevention and Water Resources Management, August, 2004
- Assessment of Hydro-Meteorological Sensors to Support Dominica's National Park Management, by Caribbean Institute for Meteorology and Hydrology, September 23, 2010
- Future climate for the Caribbean in the late 21st Century using a super-high resolution AGCM at MRI, by Trevor C Hall, September 6-17, 2010.
- SPACC Project: Dissemination Reports (No.1-8)
- Research on Temperature-Tolerant Corals for the Adaptation of Coral Reefs to Climate Change Impacts in the Caribbean, by PADECO and IDEA Consultants, June 2009
- Bequia Island's Wind Energy Powered Seawater Reverse Osmosis Preliminary Assessment, by Asmerom Gilau, December 1, 2008
- A Study of the Uncertainty in Future Caribbean Climate Using the PRECIS Regional Climate Model, by Abel Centella and Arnaldo Bezanilla, Institute of Meteorology, Cuba & Kenrick R. Leslie Caribbean Community Climate Change Centre, Belize, September 2008
- Morne Diablotin National Park and Morne Diablotin Management Plan 2009-2014, 2008
- Towards an estimate of the economic impacts of hurricanes in Central America and the Caribbean ca. 2020-2025, by J. Curry, et al, Georgia Institute of Technology, November 1, 2007
- Socio-Economic Feasibility Study: Water Demand in the Grenadines, Saint Vincent and the Grenadines Central Water & Sewerage Authority, February 2006
- Morne Trois Pitons National Park Management Plan 2002-2012, C Maximea, et al, October 2001

ORGANIZATION OF EASTERN CARIBBEAN STATES THE IMPLEMENTATION OF ADAPTATION MEASURES IN COASTAL ZONES PROJECT



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