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PROJECT PERFORMANCE ASSESSMENT REPORT

CARIBBEAN REGION

**PLANNING FOR ADAPTION TO GLOBAL CLIMATE CHANGE PROJECT
(TRUST FUND TF-028953)**

AND

**MAINSTREAMING ADAPTION TO CLIMATE CHANGE PROJECT
(TRUST FUND TF-051853)**

January 31, 2012

IEG Public Sector Evaluation
Independent Evaluation Group

Currency Equivalents (annual averages)

Exchange rate for US\$1

<i>Year</i>	<i>Eastern Caribbean Dollar*</i>	<i>Bahamian dollar</i>	<i>Barbados Dollar</i>	<i>Belize Dollar</i>	<i>Guyanese Dollar</i>	<i>Jamaican Dollar</i>	<i>Trinidad and Tobago Dollar</i>
1997	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 142	JMD 35	TTD 6.25
1998	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 150	JMD 36	TTD 6.30
1999	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 178	JMD 39	TTD 6.30
2000	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 182	JMD 42	TTD 6.30
2001	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 187	JMD 46	TTD 6.23
2002	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 190	JMD 48	TTD 6.25
2003	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 193	JMD 57	TTD 6.30
2004	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 198	JMD 51	TTD 6.30
2005	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 199	JMD 62	TTD 6.30
2006	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 200	JMD 65	TTD 6.31
2007	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 202	JMD 69	TTD 6.33
2008	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 203	JMD 72	TTD 6.29
2009	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 204	JMD 87	TTD 6.32
2010	ECD 2.7	BSD 1	BBD 2	BZD 2	GYD 203	JMD 87	TTD 6.36

*Currency of Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, Saint Lucia, St. Vincent and the Grenadines

Currency Unit = SDR

1997	US\$1.00	SDR 0.737
1998	US\$1.00	SDR 0.734
1999	US\$1.00	SDR 0.735
2000	US\$1.00	SDR 0.783
2001	US\$1.00	SDR 0.792
2002	US\$1.00	SDR 0.754
2003	US\$1.00	SDR 0.698
2004	US\$1.00	SDR 0.671
2005	US\$1.00	SDR 0.687
2006	US\$1.00	SDR 0.672
2007	US\$1.00	SDR 0.642
2008	US\$1.00	SDR 0.644
2009	US\$1.00	SDR 0.649

Abbreviations and Acronyms

5C	Caribbean Community Climate Change Center (CCCCC)
ACCC	Adaptation to Climate Change in the Caribbean
AOSIS	Alliance of Small Island States
CAS	Country Assistance Strategy
CARICOM	Caribbean Community
CARICOMP	Caribbean Coastal Marine Productivity Project
CCCCC	Caribbean Community Climate Change Centre (5C)

CCRIF	Climate Change Risk Insurance Facility
CDERA	Caribbean Disaster Emergency Response Agency
CIDA	Canadian International Development Agency
CIMH	Caribbean Institute for Meteorology and Hydrology
CORS	Continuously Operating Reference Stations
CPACC	Caribbean Planning for Adaptation to Global Climate Change
DFID	Department for International Development
DRM	Disaster Risk Management
GEF	Global Environmental Facility
GIS	Geographic Information System
GLOSS	Global Sea Level Observation System
IADB	Inter-American Development Bank
ICR	Implementation Completion Report
ICZM	Integrated Coastal Zone Management
IDA	International Development Association
IEG	Independent Evaluation Group
IEGPS	IEG Public Sector Evaluation
INC	Intergovernmental Negotiating Committee
IOCARIBE	International Oceans Commission
IPCC	Intergovernmental Panel on Climate Change
ICSECA	UNESCO – USA International Contributions for Scientific Educational and Cultural Activities (ICSECA) Project
ISR	Implementation Status Reports
M&E	Monitoring and Evaluation
MACC	Mainstreaming Adaptation to Climate Change
MTR	Mid-term Review
NAPA	National Adaptation Programmes of Action
NCCC	National Climate Change Committee
NFP	National focal points
NOAA	National Oceanic and Atmospheric Administration
OAS	Organization of American States
OECS	Organization of Eastern Caribbean States
PAC	Project Advisory Committee
PAD	Project Appraisal Document
PIU	Project Implementation Unit
PPAR	Project Performance Assessment Report
PPCR	Pilot Program for Climate Resilience
RAC	Regional Archiving Center
SLR	Sea Level Rise
SPACC	Implementation of Adaptation Measures in Coastal Zones
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Program
UNFCCC	United Nations sponsored Framework Convention on Climate Change
USAID	United States Agency for International Development
UWI	University of the West Indies
UWICED	University of the West Indies
VRA	Vulnerability and Risk Assessments

Fiscal Year

Government: January 1 -- December 31

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This report was prepared by Richard Worden who assessed the project in December 2010. The report was peer reviewed by Kenneth Chomitz and panel reviewed by Soniya Carvalho and Martha Ainsworth. Marie Charles and Viktoriya Yevsyeyeva provided administrative support.

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Principal Ratings

PLANNING FOR ADAPTATION TO GLOBAL CLIMATE CHANGE PROJECT (GEF TRUST FUND GRANT TF028953)

	<i>ICR*</i>	<i>ICR Review*</i>	<i>PPAR</i>
Outcome	Satisfactory	Satisfactory	Moderately Unsatisfactory
Risk to Development Outcome	-	-	Significant
Sustainability**	Likely	Unlikely	-
Institutional Development Impact**	Substantial	Substantial	-
Bank Performance	Satisfactory	Satisfactory	Unsatisfactory
Borrower Performance	Satisfactory	Satisfactory	Moderately Satisfactory

MAINSTREAMING ADAPTATION TO GLOBAL CLIMATE CHANGE PROJECT (GEF TRUST FUND GRANT TF-051853)

Outcome	Moderately Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory
Risk to Development Outcome	Moderate	Moderate	Moderate
Bank Performance	Moderately Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory
Borrower Performance	Moderately Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory

* The Implementation Completion and Results Report (ICR) is a self-evaluation by the responsible Bank department. The ICR Review is an intermediate IEG product that seeks to independently verify the findings of the ICR. ** The rating on sustainability has been replaced by risk to development outcome. The rating on institutional development impact has been discontinued; to the extent that the project has objectives to strengthen institutions, these results are taken into account in the outcome rating.

Key Staff Responsible

PLANNING FOR ADAPTATION TO GLOBAL CLIMATE CHANGE PROJECT (GEF TRUST FUND GRANT TF028953)

<i>Stage</i>	<i>Task Manager/Leader</i>	<i>Sector Director</i>	<i>Country Director</i>
Appraisal	Claudia Alderman	Jonathan Parker (Acting)	Paul Isenman
Completion	Walter Vergara	John Redwood	Orasalia Kalantzopoulos

MAINSTREAMING ADAPTATION TO GLOBAL CLIMATE CHANGE PROJECT (GEF TRUST FUND GRANT TF051853)

<i>Stage</i>	<i>Task Manager/Leader</i>	<i>Sector Director</i>	<i>Country Director</i>
Appraisal	Benoit Paul Blarel	John Redwood	Orasalia Kalantzopoulos
Completion	Walter Vergara	Laura Tuck	Yvonne M. Tsikata

IEG Mission: Improving development results through excellence in evaluation.
About this Report

The Independent Evaluation Group assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the Bank's self-evaluation process and to verify that the Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, IEG annually assesses 20-25 percent of the Bank's lending operations through field work. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or Bank management have requested assessments; and those that are likely to generate important lessons.

To prepare a Project Performance Assessment Report (PPAR), IEG staff examine project files and other documents, visit the borrowing country to discuss the operation with the government, and other in-country stakeholders, and interview Bank staff and other donor agency staff both at headquarters and in local offices as appropriate.

Each PPAR is subject to internal IEG peer review, Panel review, and management approval. Once cleared internally, the PPAR is commented on by the responsible Bank department. The PPAR is also sent to the borrower for review. IEG incorporates both Bank and borrower comments as appropriate, and the borrowers' comments are attached to the document that is sent to the Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

About the IEG Rating System for Public Sector Evaluations

IEG's use of multiple evaluation methods offers both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. IEG evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (additional information is available on the IEG website: <http://worldbank.org/ieg>).

Outcome: The extent to which the operation's major relevant objectives were achieved, or are expected to be achieved, efficiently. The rating has three dimensions: relevance, efficacy, and efficiency. *Relevance* includes relevance of objectives and relevance of design. Relevance of objectives is the extent to which the project's objectives are consistent with the country's current development priorities and with current Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). Relevance of design is the extent to which the project's design is consistent with the stated objectives. *Efficacy* is the extent to which the project's objectives were achieved, or are expected to be achieved, taking into account their relative importance. *Efficiency* is the extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. The efficiency dimension generally is not applied to adjustment operations. *Possible ratings for Outcome:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Risk to Development Outcome: The risk, at the time of evaluation, that development outcomes (or expected outcomes) will not be maintained (or realized). *Possible ratings for Risk to Development Outcome:* High, Significant, Moderate, Negligible to Low, Not Evaluable.

Bank Performance: The extent to which services provided by the Bank ensured quality at entry of the operation and supported effective implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of supported activities after loan/credit closing, toward the achievement of development outcomes. The rating has two dimensions: quality at entry and quality of supervision. *Possible ratings for Bank Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower (including the government and implementing agency or agencies) ensured quality of preparation and implementation, and complied with covenants and agreements, toward the achievement of development outcomes. The rating has two dimensions: government performance and implementing agency(ies) performance. *Possible ratings for Borrower Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Preface

This is a Project Performance Assessment Report (PPAR) for the *Caribbean Planning for Adaptation to Global Climate Change Project* (GEF TF-28953) and *Mainstreaming Adaptation to Climate Change Project* (GEF TF-51853) prepared by the Independent Evaluation Group (IEG). These projects represent the first two of a three-project program of support for climate change adaptation in the Caribbean based on the United Nations sponsored Framework Convention on Climate Change (UN Framework) three-stage model of sequenced climate change adaptation activities: planning, enabling, and implementation of pilot demonstration measures.

The first stage *Planning for Adaptation* project (US\$6.5 million, 1997-2002) was funded by a Global Environmental Facility (GEF) grant of US\$6.21 million that was approved on March 4, 1997, and became effective on April 11, 1997. An additional US \$349,500 was provided in June 1998 to allow St. Vincent and the Grenadines to conduct initial activities under the project following their approval of the UN Framework Convention. The project closed on November 29, 2002, eleven months after originally planned, with all GEF trust funds having been disbursed.

The second stage “enabling” *Mainstreaming Adaptation* project (US\$10.95 million, 2003-2009) was funded by a US\$5 million GEF grant approved on March 17, 2003, that became effective on June 24, 2003. The project was co-financed by the Canadian International Development Agency (CIDA, US\$2 million) and the United States Agency for International Development (USAID, US\$0.8 million), with a counterpart contribution from the Recipient of US\$3.1 million. The project closed on March 30, 2009, eighteen months after originally planned, with nearly US \$37,000 of the GEF grant having been cancelled.

This PPAR was prepared by Richard Carlos Worden, IEG Senior Environmental Specialist, and will serve as an input to the upcoming IEG report on climate change adaptation experiences within the World Bank Group. The findings of this assessment are based on two IEG missions to the Caribbean in November and December of 2010. Meetings and structured interviews were conducted with regional, national and local Government officials, project implementing and executing agencies, local and international environmental NGOs working on related activities in the region, other donors, and project partners and beneficiaries. IEG also conducted site visits to seven project sites in four participating countries. The author also reviewed project documents, internal and external literature on related projects and scientific approaches, and interviewed Bank staff and other project stakeholders.

The author gratefully acknowledges the time and assistance provided by so many project staff, especially in the Caribbean Community Climate Change Centre, the United Nations Development Programme (UNDP) for Disaster Risk Reduction in the Caribbean, and by the national focal points and project coordinators who gave so generously of their valuable time to be interviewed. Following standard IEG procedures, copies of the draft PPAR were sent to the relevant government officials and agencies for their review and comments before being finalized. No comments were received.

Summary

This Project Performance Assessment Report (PPAR) assesses the *Caribbean Planning for Adaptation to Global Climate Change Project* (1997-2002) and the *Mainstreaming Adaptation to Climate Change Project* (2003-09), representing the first two stages of a three-stage series of climate change adaptation projects in the Caribbean region financed by Global Environment Facility (GEF) grants. The third project in this series is the *Implementation of Adaptation Measures in Coastal Zones Project*. This is the first series of GEF-financed projects to attempt to implement the three-stage approach to climate change adaptation interventions developed by the United Nations Framework Convention on Climate Change (UN Framework) on a regional scale. Thus, these projects represented pioneering work in attempting to develop the scientific knowledge base, technical and institutional capabilities, public awareness, and political support needed to implement climate change adaptation measures in the region.

The purpose of Stage I activities in the UN Framework is to first build a solid foundation of public awareness and political support for climate change adaptation policies, plans, and actions in the region based on knowledge of the region's vulnerability to the potential impacts of climate change. In Stage II, enhanced knowledge and information is expected to help create the enabling policy platform and technical capacity to support the preparation of pilot climate change adaptation measures in selected countries. Finally, Stage III project pilot activities are intended to demonstrate the applicability and effectiveness of adaptation measures with a view to replicating them as models in other countries of the region, or in other parts of the world. Although the Caribbean region is a relatively small contributor to the production of greenhouse gases (estimated at 0.15 percent of total global carbon dioxide emissions), it is extremely vulnerable to their impacts and thus was eligible to qualify for climate adaptation assistance from the GEF and other donors.

Caribbean Planning for Adaptation to Global Climate Change Project

The objective of the \$6.2 million *Planning for Adaptation Project* was to “support Caribbean countries in preparing to cope with the adverse effects of global climate change, particularly sea level rise, in coastal and marine areas through vulnerability assessments, adaptation planning, and capacity building linked to adaptation planning.” The project financed a number of innovative activities at the regional and national level, in 12 of the 15 member states of the Caribbean Community (CARICOM), with the aim of affecting three main outcomes:

- **Enhanced generation of sound scientific knowledge and access to information** that informs public policies, plans and programs on potential climate change impacts, and the vulnerability of the region's human populations, assets, and ecosystems to them.
- **Strengthened regional and national institutions** that are better prepared to take steps to cope with the adverse effects of climate change in the region.

- **Increased public awareness and political support** regarding the need to take pro-active steps to minimize climate change risks in the region.

The project was challenged during implementation by the large number of activities at both the regional and country level, in the context of very small states with limited capacity in which new regional and national institutions were being developed.

In terms of generating sound scientific knowledge and access to information, the project supported the creation of a network of 18 sea level rise monitoring stations. However, maintenance was inadequate, and by the end of the project in 2002 only 12 of the 18 stations were actively transmitting data to the National Oceanic and Atmospheric Administration's weather forecasting satellites; by 2005, none were consistently transmitting data. The stations, when functioning, were taking readings only once per hour; a project design with more frequent readings would have contributed to early warning systems' forecasting of near-term extreme weather events at little or no additional cost. Problems were encountered in organizing and institutionalizing the regional archiving system of the collected data, and the data were not updated regularly or easily accessible. Vulnerability and risk assessments were piloted in Barbados, Grenada, and Guyana, but there were shortcomings in acquiring baseline data and in the technical capacity to carry out these assessments, resulting in a lack of credible climate change scenarios at the regional or national level. A coral reef monitoring pilot program was conducted in one coral reef habitat each in the Bahamas, Belize, and Jamaica. Information exchange and dissemination workshops were not conducted, diminishing the degree of take-up by other countries in the region.

With respect to strengthening regional institutions, the project set up a Regional Project Implementation Unit at the University of the West Indies in Barbados, linked to national coordination committees and national focal points. The regional institution had a slow and difficult start up. While its capacity improved over the course of the project, the institution was not retained for the follow-on project. Strategic relationships with other key organizations were created, but the international expertise potentially accessible through these relationships was not fully exploited. In contrast, the network of national coordination units and focal points was relatively more successful in promoting nascent climate change adaptation efforts and regional climate adaptation initiatives at the national and sectoral levels.

In terms of generating public awareness and political support, ten of the 12 countries prepared Issues Papers using existing data to develop policy option matrices of expected climate risks in key sectors of the national economy, but the proposals did not result in new policies. These and other pilot activities were generally not disseminated because of a funding shortfall in at the end of the project. There was no baseline information on public awareness and it was not systematically monitored.

The **Outcome** of the project is rated **moderately unsatisfactory**. The project's objective was highly relevant to the Bank's regional strategies, past and present. It was also highly relevant to the region's priorities and needs, as expressed in the *Barbados Programme of Action* (1994, updated in 1999), adopted by the Small Island Developing

States Conference, and the *Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States*, adopted in 2005 by the Caribbean heads of state as the blueprint for coordinated action to address national and regional sustainable development challenges. The relevance of the project's design was modest. While the project's components should have led logically to achieving the objective, there were a number of activities that were not essential. The absence in the design of a mechanism for ensuring adequate finance for maintenance of the sea level rise station monitoring network detracted from achieving the objective. As described above, while there was some progress, all three outcomes were only modestly achieved. Due to serious project start-up delays and problems with the implementation unit's operation, disbursements and procurement procedures, and slow and uneven progress, project efficiency was modest.

The **Risk to Development Outcome** is **significant** due primarily to inadequate resources and country ownership to maintain the sea level rise monitoring stations and the inability of the project to establish a stable and competent regional entity to carry out the critical data collection and mobilization functions.

Bank Performance was **unsatisfactory**. Quality at Entry was moderately unsatisfactory due to the excessive complexity and lack of prioritization of the project design, overlap with other emergency recovery and disaster risk management projects, and its failure to adequately assess the capacity of the original project implementation unit. Quality of Supervision was unsatisfactory due to the Bank's failure to take corrective actions to remedy low disbursement levels, poor performance, and inadequate fiduciary controls and reporting obligations required of the Regional Project Implementation Unit until the Mid-Term Review. Only seven supervision missions were conducted during the five years of project implementation; supervision reports lacked candor and failed to address major problems openly and directly.

The **Borrower Performance** was **moderately satisfactory**. The CARICOM Governments' performance was moderately satisfactory. They provided political support for the project's conception, design, and implementation but did not demonstrate strong commitment to the project's objective by contributing additional funds to the maintenance of the sea level rise stations in the face of a shortfall in the value of the GEF grant. The implementing agencies' performance was moderately satisfactory. A number of start-up problems with logistical arrangements, procurement, and financial management were encountered by the regional project implementation unit; after overcoming these start-up problems, it carried out its functions satisfactorily and coordinated its efforts with other regional and national entities. The national climate change focal points and coordination committees functioned capably and coordinated with regional institutions to promote national-level initiatives.

The **quality of monitoring and evaluation** was **substantial**. A comprehensive M&E Plan was prepared and the system provided information on project implementation and outputs that was used to adjust and modify two project components to more closely align them with the clients' preferences.

Mainstreaming Adaptation to Climate Change Project

The objective of the *Mainstreaming Adaptation Project* (US \$10.55 million) was to “facilitate the creation of an enabling environment for climate change adaptation in CARICOM small island and coastal developing states.” Its major intended outcomes were similar to the *Preparing for Adaptation Project*:

- **Enhanced scientific knowledge and access to information** that informs public policies, plans and programs about potential climate change impacts, and the vulnerability of human populations, assets, and ecosystems to them.
- **Strengthened regional and national institutions** to mainstream climate change adaptation plans into the policies, plans, and programs of key sectors and ministries.
- **Increased public awareness and political support** regarding the need to take pro-active steps to minimize climate change risks in the region.

In terms of enhanced scientific knowledge, the project downscaled existing global climate change models to a scale more useful to the region’s nations. A second attempt was made to establish a network of 11 sea level rise monitoring stations to generate time-series data on sea level rise and other hydro-meteorological data. However, lack of maintenance, coupled with use of technically inappropriate technology undermined these attempts. As of 2011, only three of these stations were transmitting data. Data mobilization functions were never fully integrated with other systems in the region nor was the information made useful to a broad range of user communities.

Institutionally, the project implementation unit within the CARICOM Secretariat was replaced three years into the project by the Caribbean Community Climate Change Center, which is now recognized as the regional center of excellence providing highly technical scientific information to member countries. However, the national climate change committees and focal points established under the previous project were challenged by resource constraints.

With respect to public awareness and political support, only limited progress was made on the Regional Public Education and Outreach Strategy and the seven new national strategies. Due largely to delays in implementation before project restructuring, there was a lack of time and resources to adequately disseminate the results that would have allowed greater participation of national counterparts in policy-making processes and decisions. The original target of developing national multisectoral climate adaptation strategies in all 12 countries was scaled back to developing single-sector strategies, institutional analyses, and action plans in each of four pilot countries. This modified target was met. There appears to have been some take-up of the recommendations in new national water policies in Belize and Jamaica, but IEG found only modest tangible impacts on Barbados’ new tourism strategy or of adaptation measures to protect coastal agricultural areas in Guyana. As with the previous project, public awareness was not tracked, nor was there much in the way of tangible evidence to demonstrate an increase in political support for climate change adaptation in the region that could be attributed to the project.

The **Outcome** of the Project is rated **moderately unsatisfactory**. The objectives remained highly relevant to the development needs of the region and were consistent with the Bank's assistance strategies over the past 15 years. The design was substantially relevant to achieving the project objective, since it articulated the linkages between project inputs and outputs and the activities were more carefully focused on achieving the main outcomes. The project substantially strengthened regional institutions' capabilities but made only modest progress toward enhancing scientific knowledge, access to information, public awareness, and political support. The efficiency of project implementation was modest.

The **Risk to Development Outcome** is **moderate**. The urgent need to address the region's vulnerability to its likely impacts is now widely acknowledged. The Caribbean Community Climate Change Centre has become the region's recognized institutional leader for climate change information. However, well-functioning national institutions coordinating with one another are also required to move the climate change adaptation agenda forward. The maintenance of the new network of 11 sea level rise stations and the lack of a comprehensive, coordinated approach to mobilize that monitoring data remain unresolved.

Overall **Bank Performance** was **moderately unsatisfactory**. The Quality at Entry was moderately unsatisfactory. The special unit within the CARICOM Secretariat was selected to manage the project without having had an institutional capacity assessment done, and the consequences for project implementation were significant. The Quality of Supervision was also moderately unsatisfactory. There were long gaps between supervision visits, project status reports lacked candor, and corrective action was not taken until nearly three years after project approval.

Overall **Borrower Performance** was **moderately unsatisfactory**. The Governments' performance was moderately satisfactory because the Heads of State of CARICOM have given greater prominence to the challenges posed by climate change and recognition of their countries' vulnerability to its impacts. Climate change adaptation is now a permanent item on their semi-annual meetings of CARICOM, which endorsed the Caribbean Community Climate Change Centre taking the lead to coordinate climate change policies and activities in the region. However, CARICOM countries have been slow to approve and implement recommended sectoral policies and practices. The Implementing Agencies' Performance was moderately unsatisfactory. The performance of the project implementation unit during the first three years of the project nearly resulted in the cancellation of the project. Following the restructuring after the Mid-Term Review, it took a marked turn for the better under the leadership of the Caribbean Community Climate Change Center, which initiated long-overdue activities, improved its fiduciary controls and procedures, built local capacities and partnerships, and achieved tangible results in the last two years of project implementation.

The **Quality of Monitoring and Evaluation** was **modest**. The linkages between inputs, outputs, and outcome indicators were very clear, but in many cases targets were either not given or not quantified. The large number of indicators (30) and extensive Bank reporting

requirements imposed cumbersome and labor intensive burdens on the project implementation unit.

Lessons Learned

- **The UN Framework’s three-stage conceptual model for sequencing climate change adaptation efforts is comprehensive, but by compressing so many activities in the first stage of the process, it is too demanding of scarce human capital, particularly in small developing country contexts with limited absorptive capacities.** It is important to focus on the core tasks of collecting long-term climate change related-data and developing the systems, models and capabilities to make that information as accessible and useful as possible to the broadest possible range of user communities while coordinating with disaster risk management efforts within the broader context of poverty alleviation, environmental sustainability and human development.
- **Adapting to climate change is a complex and multi-sectoral challenge requiring an integrated and collaborative approach. However, this does not have to be done all at once or within a single project if doing so makes implementation unmanageable.** Getting a few things right is better than trying to do too much and losing project focus in the process, as happened in this series of projects. The central task and unique contribution that these projects could have made of establishing a functional network of sea level rise and hydro-meteorological monitoring stations coordinating with other existing networks and integrating its data into the different informational needs of various users communities in the region was not accomplished.
- **Building complementary institutional and technical capacities at both the regional and national levels can have synergistic effects unachievable by pursuing tasks at either level alone.**
- **There are areas of significant overlap found between disaster risk management and climate change adaptation efforts.** It is important that each focus on specific core tasks where they have comparative advantages of expertise and experience, but they also need to find areas where their common objective of reducing climate-related risks in both the short- and long-run can produce mutual benefits.

Caroline Heider
Director-General
Evaluation

1. Background and Context

1.1 This report presents the Independent Evaluation Group's (IEG) assessment of the extent to which the preparatory steps and enabling environment were created for climate change adaptation activities in the Caribbean region, how well various participants in that endeavor performed, and lessons learned from the experiences of the Caribbean Planning for Adaptation to Global Climate Change Project (henceforth the *Planning for Adaptation Project*) and the Mainstreaming Adaptation to Climate Change Project (henceforth the *Mainstreaming Adaptation Project*) to consider in future climate change adaptation efforts.

1.2 These two projects represented the first two of a three-project series of climate change adaptation projects spanning the period 1997-2009, supported by Global Environment Facility (GEF) Trust Fund grants and administered by the World Bank. The third project in this series, *Implementation of Adaptation Measures in Coastal Zones Project*, a five-year, US \$2.1 million demonstration project in three CARICOM countries closed in December 2011. The three projects were designed to correspond to the sequence of activities in the three-stage approach of the United Nations Framework Convention on Climate Change. The *Planning for Adaptation Project* was applied in the vulnerable low-lying island nations of the Caribbean region to help them “in preparing to cope with the adverse effects of global climate change, particularly sea level rise, in coastal and marine areas through vulnerability assessments, adaptation planning, and capacity building linked to adaptation planning.”¹ The objective of the *Mainstreaming Adaptation Project* was to “facilitate the creation of an enabling environment for climate change adaptation in CARICOM small island and coastal developing states.”² This broad objective was further defined in the Project Appraisal Document as an effort of “further building institutional capacity, strengthening the knowledge base, and deepening [public] awareness and participation.”³

Global Climate Change Adaptation Backdrop

1.3 Global concern about climate change and its potential impacts prompted the international community to begin holding various fora in the 1990s as a means to organize the world's response to greater climate instability and variability by attempting to mitigate its impacts through reductions in the emission of greenhouse gases. By focusing on the mitigation of greenhouse gases, the international community essentially relegated adaptation measures to a position of secondary importance. However, there was a growing awareness among a number of Caribbean island nations that did not emit large quantities of greenhouse gases that they were nonetheless highly vulnerable to weather-related risks that would be exacerbated by climate change, such as hurricanes, floods, and drought. For these countries, adaptation to climate change was the only realistic strategy to prepare for the inevitable impacts that greater climate instability and variability would bring.

¹World Bank 1997b, p. 5.

² World Bank 2003b, p. 2, and Schedule 2 of the Grant Agreement (TF-051853), April 29, 2003.

³ World Bank 2003b, p. 10.

1.4 In 1990, the Alliance of Small Island States was formed as an inter-governmental organization of low-lying coastal and small island countries for the purpose of adding their voices to the call for greater emphasis on adapting to the unavoidable impacts of global climate change. In 1991, the United Nations sponsored a Framework Convention on Climate Change and formed the first Intergovernmental Panel on Climate Change. By 1994, the Intergovernmental Negotiating Committee had agreed at its Tenth Conference of the Parties (COP-10) session that adaptation to these adverse climate change effects would require short, medium, and long-term strategies which were cost-effective, took into account important socio-economic implications, and would be implemented in a sequenced three-stage process in participating developing countries. In response to this new convention, the Intergovernmental Panel developed a detailed series of response measures ranging from preparatory planning activities, such as initial national communications and vulnerability assessments, to those creating an “enabling environment,” such as institutional capacity building, public-private partnerships, and joint recognition and “ownership” of the threat posed by climate change in small island developing states, and subsequently of the need to implement pilot adaptation responses, such as planned retreat, accommodation, and protection. This came to be known as the UN Framework Convention’s three-stage model of climate change adaptation (Box 1).

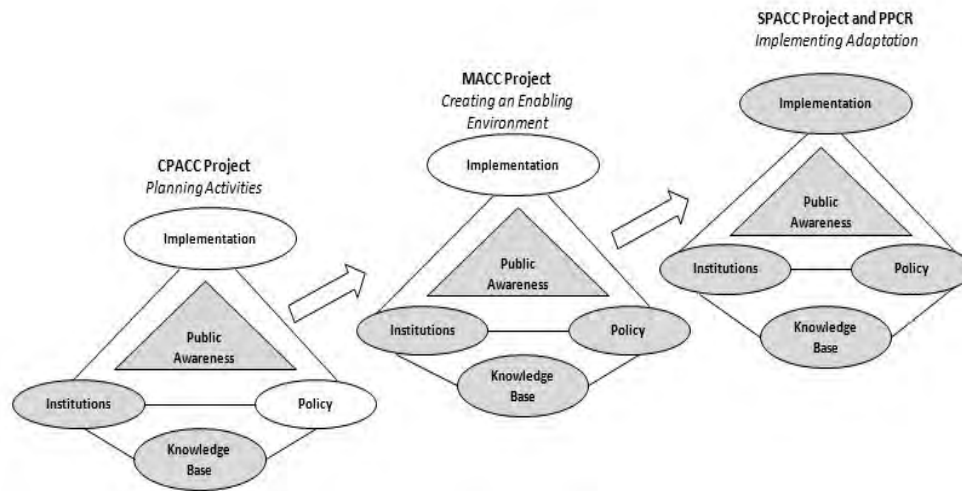
Regional Climate Change Adaptation Efforts

1.5 The *Planning for Adaptation* Project had its genesis in the global Small Island Developing States conference held in Barbados in 1994. The *Barbados Programme of Action* was an output of the conference, requesting assistance from the General Secretariat of the Organization of American States (OAS) to develop a project on climate change adaptation on the basis of regional technical consensus around 15 priority action areas, including eight thematic areas directly affected by climate change impacts, and amenable to adaptation responses. The project proposal was developed by 12 countries of the 15 Caribbean community of nations known as CARICOM⁴ with OAS participation. It was approved by the Council of CARICOM Ministers of Foreign Affairs, and presented to the GEF Council, which approved it in May 1995.

1.6 The *Barbados Programme of Action* has been updated regularly. The 1999 update, for example, identified the same issues among its top priority areas of action. In 2005, the *Mauritius Strategy for the Further Implementation of the Programme of Action for the Small Island Developing States* was adopted as the “blueprint” for coordinated action to address national and regional sustainable development challenges by the Caribbean region’s heads of government. What was notable about the *Mauritius Strategy* was that it stated the small island developing states demonstrated “commitment to sustainable development through utilization principally of [their] own resources in the implementation of the [*Barbados Programme*]” and noted “an increase in ad-hoc stand-alone projects, rather than a

⁴ The 15 member states of CARICOM are: Antigua & Barbuda; Bahamas; Barbados; Belize; Dominica; Grenada; Cooperative Republic of Guyana; Haiti; Jamaica; Monserrat; St. Kitts and Nevis; Saint Lucia; St. Vincent & the Grenadines; Suriname; and Trinidad & Tobago. However, three CARICOM countries did not participate in the project: Haiti, Monserrat, and Suriname.

Box 1. The 3-Stage Model of Climate Change Adaptation



Stage I involves planning activities to build the scientific knowledge and information base to support subsequent climate-resilient strategies, policies, plans, and actions, the required institutional capacity to sustain and “internalize” these efforts, and the public and political educational and outreach programs required to build a broad-based understanding of the need for and support of timely and adequate climate change mitigation and adaptive strategies, policies, plans, and actions.

Stage II activities were designed to encompass measures that would create an “**enabling environment**” by continuing to deepen and expand Stage I activities by improving the scientific knowledge base of climate change impacts and regional vulnerability to it. In addition, such enabling conditions included building greater institutional capacity and self-reliance while generating information to inform the public and policy-makers about the potential impacts, vulnerabilities, and adaptive responses at both the regional and country levels.

Stage III involves in the selection, evaluation, design, and **implementation of pilot adaptation measures** taken to demonstrate their efficacy and cost-effectiveness of the interventions developed in the first and second phases for possible replication elsewhere in the region or in other regional small island developing states around the world (states in the Pacific and Africa, the Indian Ocean, Mediterranean, and South China Sea).

Source: United Nations Framework Convention on Climate Change 1995, English version, pp. 34-38.

programmed or strategic approach” being taken by international and bilateral donors.”⁵ The significance of this statement was that it signaled the small island developing states’ growing maturation and desire to assume greater responsibility and control over donor programs aimed at “promoting sustainable development by implementing strategies which build resilience and capacity to address their unique and particular vulnerabilities.”⁶

⁵ Mauritius Strategy for the Further Implementation of the Programme of Action for the SIDS, para. 4.

⁶ Mauritius Strategy for the Further Implementation of the Programme of Action for the SIDS, para. 6.

1.7 In March 2010, the Caribbean small island developing states held a Regional Meeting in Grenada to prepare for the global meeting in September to review progress made on the *Mauritius Strategy* since 2005. The Five-Year Review of the Mauritius Strategy Report that resulted from that regional conference made the following statement: “Significant changes in perception have taken place over the [*Barbados Programme*] implementation period about the role of the environment in sustainable development. Some Caribbean small island developing states have now embraced major policy shifts, adopting various approaches to transform their economies into green economies...The acceptance of the philosophy of a green economy is having a profound impact on the way Caribbean small island developing states approach their future development, in particular in the use and protection of natural resources. The environment is now seen, although this may not yet be fully reflected in policy and regulatory terms, as an integral part of these countries’ long-term social and economic development strategies.”⁷

Other Related Regional Projects

1.8 At the regional level, one of the earliest interventions was the Caribbean Environment Programme, as part of a broader United Nations Environment Program (UNEP) Regional Sea Initiative. The Caribbean Programme undertook studies to assess ecosystem and socioeconomic responses to future climate change in marine and coastal areas of the Caribbean region in 1981. UNEP/Caribbean Environment Programme also began the process of designing and installing the Global Sea Level Observing System's (GLOSS) tidal gauge network of 26 sea-level rise (SLR) monitoring stations in the wider Caribbean.

1.9 There were a half dozen other ongoing Bank-supported disaster risk management projects in the region that complemented the two climate change adaptation projects, including the *Emergency Recovery and Disaster Management Projects* in St. Lucia, Grenada, Dominica, St. Vincent and the Grenadines, and St. Kitts and Nevis (between 1993 and 2003) as well as the two more recent *Disaster Management Projects* in St. Lucia (from 2004 onward to the present), and several national-level watershed or risk management projects. In addition, there were several Inter-American Development Bank-supported emergency response and reconstruction projects, the *Caribbean Disaster Mitigation Project* supported by the US Agency for International Development (USAID), and a number of country-specific projects to support “enabling activities” through the UNDP and UNEP with GEF funding to develop those countries’ “First National Communications” describing their responses to climate change risks and impacts.

1.10 The most important other non-World Bank project was the Canadian International Development Agency’s (CIDA) US \$3.14 million *Adaptation to Climate Change in the Caribbean Project*, which acted as a bridging mechanism between the closing of the *Planning for Adaptation Project* and the effectiveness date of the *Mainstreaming Adaptation Project* eight months later.

⁷ Caribbean Regional Report for the Five-Year Review of the Mauritius Strategy For the Further Implementation of the BPOA [Barbados Programme of Action] for the SIDS (MSI +5), p. viii of the Executive Summary; May 2010.

2. Caribbean Planning for Adaptation to Global Climate Change Project (1997 – 2002)

Project Objectives and Design

2.1 **Objective.** *The Caribbean Planning for Adaptation to Global Climate Change Project's* overall objective was to “support Caribbean countries in preparing to cope with the adverse effects of global climate change..., particularly sea level rise..., in coastal and marine areas through vulnerability assessments, adaptation planning, and capacity building linked to adaptation planning.”⁸

2.2 **Components.** The US\$6.25 million project sought to achieve its overall objective through a coordinated two-track approach of implementing four regional activities complemented by four country-level pilot project activities (later expanded to include *a fifth country-level component* of start-up activities in St. Vincent and the Grenadines).

2.3 The four **regional** coordinating components were:

- **Component 1: Design and Establishment of a Sea-Level Rise and Climate Monitoring Network** (US\$823,900) involving the installation of 18 sea level rise (SLR) and weather monitoring gauge stations in the 11 participating countries, along with two geocentric landmass fixing survey Continuously Operating Reference Stations (CORS) to measure tectonic movements. Training of national specialized agencies (that is, meteorological services) was provided to collect uploaded SLR data from satellites under the guidance and supervision of the Caribbean Institute for Meteorology and Hydrology (CIMH). A Regional Archiving Center (RAC) was to be established to obtain monitoring data from the satellite download station.
- **Component 2: Establishment of Project Databases and Management Information Systems** (\$392,000) as an enabling activity, this component cut across other project components facilitating access to information by assessing the capacity of involved regional and national institutions to acquire, analyze, store, and disseminate information on climate change and project activities. Component 2 supported activities also were used to procure system components, train staffs, develop training materials and operating manuals, and provide follow-up technical support.
- **Component 3: Inventory of Coastal Resources and Use** (\$690,100) was to provide baseline inventory of data on the physical characteristics of coastal and marine resources for the execution of other project activities.
- **Component 4: Formulation of a Regional Adaptation Policy Framework for Integrated Coastal and Marine Management** (\$299,700) was to support the development of a generic policy framework for integrated coastal zone planning and management for all the participating countries.

⁸ World Bank 1997b, p. 5. This is identical in wording to the GEF Grant Agreement (GEF Trust Fund Grant Agreement (TF-028953), Schedule 2, March 13, 1997).

2.4 Complementing these regional components, 12 countries of the 15-nation Caribbean Community (CARICOM) participating in the project (the exceptions were Haiti, Montserrat and Suriname) were given the opportunity to choose one of four pilot project activities to implement at the **country level**. These four country-level pilot project components and the CARICOM countries associated with them were as follows:

- **Component 5: Coral-Reef Monitoring for Climate Change** (\$405,900) in The Bahamas, Belize, and Jamaica was to increase their knowledge about the sources and extent of coral reef degradation by establishing a long-term, harmonized monitoring program to assess conditions and trends, disseminating information, and raising public awareness about the effects of climate change on coral reefs.
- **Component 6: Vulnerability and Risk Assessments of Coastal Areas** (\$433,400) in Barbados, Grenada, and Guyana to inform and educate the general public about vulnerable coastal areas and the need to prepare for the impacts exacerbated by climate change, and prepare draft climate change adaptation strategies based on them.
- **Component 7: Economic Valuation of Coastal Resources** (\$312,300) in Dominica, St. Lucia, and Trinidad and Tobago to design and execute pilot studies on the economic value of avoided damages to natural environments and built (man-made) assets in selected coastal areas to demonstrate the value of environmental accounting and valuation tools in policy and regulatory decision-making processes.
- **Component 8: Formulation of Economic/Regulatory Proposals** (\$189,000) in St. Kitts & Nevis and Antigua and Barbuda to assess the design and utility of economic and regulatory approaches to addressing sea level rise threats in coastal and marine resource management. Component also sought to demonstrate how innovative approaches to environmental management, such as using economic incentives and disincentives, might provide more flexible, cost-effective, and effective alternatives to command-and-control methods.

2.5 **Tidal gauge station maintenance and replacement fund.** An earmarked tidal gauge station maintenance and replacement fund was to be established “in an amount of not less than SDR 40,000 equivalent”⁹ (approximately US \$50,000) under the GEF Grant Agreement with the Caribbean Meteorological Institute (it later changed its name to the Caribbean Institute of Meteorology and Hydrology or CIMH) for that specific purpose. There was no apparent ex-ante analysis done regarding the adequacy of the fund’s size to serve its intended purpose, but in interviews with several regional experts, the fund was described as having been grossly inadequate (by a factor of 10), and the Bank was criticized for its failure to ensure adequate technical peer review prior to establishing the fund’s resourcing threshold. In addition, although the fund was established within 36 months of the project’s initiation, its resources were “redirected” to support other project activities, and then later the fund was “replenished” under the *Mainstreaming Adaptation Project*.

2.6 **Implementation arrangements.** Under the terms of the Grant Agreement, the Regional Project Implementation Unit (PIU) was to be established in the Centre for Environment and Development at the University of the West Indies (UWICED) to carry out

⁹ Grant Agreement, Schedule 2, Part A.2; 13 March 1997.

the day-to-day technical, administrative, and financial management of project activities. The PIU and National Implementation Coordination Units, with a climate change focal point leading each of them were responsible for entering into agreements with each other to define their mutual obligations to establish and maintain themselves with sufficient staff, equipment, and resources to operate, to coordinate project activities at both the regional and national levels, provide the necessary logistical support to support and maintain the equipment provided by the project such as the sea level rise monitoring stations, and assist in the preparation of required reports and reviews of the project as required by the Bank. The PIU also coordinated project activities with other regional entities, in particular with Caribbean Institute for Meteorology and Hydrology (mentioned above) and various institutes within the University of the West Indies system while the national units selected staff from appropriate agencies to participate in pilot project activities at the country level.

2.7 Above this level, a Project Advisory Committee was set up to provide policy guidance, to review and approve implementation work programs, and evaluate project results. The Committee was comprised of one representative from CARICOM, who acted as its chair; a representative from the GEF Council; two representatives of the national units; and one representative each from UWICED, the UNEP's Caribbean Environment Programme, the UNDP, and the NGO community.

Implementation

2.8 **Planned vs. actual disbursements.** The project was originally supported by a US \$6.3 million GEF grant. An additional US\$349,500 was provided in June 1998 to allow St. Vincent and the Grenadines to conduct start-up activities under the project, which ratified the Framework Convention after the start of the project. Of this estimated amount, only US \$100,000 was actually spent. Adverse movements in the exchange rate of the Special Drawing Rights relative to the US dollar over the course of the project resulted in a loss of US\$435,000.

2.9 Actual disbursements remained fairly consistent with estimated expenditures at appraisal across all nine project components, as can be seen in Table 1 below, never veering more than US \$60,000 from the estimate at appraisal. Just over US\$2 million was spent to set up the PIU at the UWICED in Barbados, and another two-thirds of a million dollars to cover the OAS's executing agency costs. Subtracting physical and price contingencies of US\$240,000 and administrative costs, total project funds to cover the nine activity areas amounted to only US\$3.25 million. The project closed on November 29, 2002, eleven months after originally planned, with all GEF trust funds having been disbursed and a little less than US\$30,000 cancelled, mostly from the GEF grant proposal preparation process.

2.10 **Implementation Experience.** The project got off to a slow start in its first year due to delays in establishing the Regional Project Implementation Unit at the UWICED in Barbados and establishing the network of national implementation coordination units and focal points. The University's administrative and financial management procedures were too cumbersome and restrictive to keep up with the project implementation schedule established for the project by the OAS and World Bank. Recommendations emanating from a management review undertaken just prior to the Mid-Term Review in 1999 resulted in

changes to the University's procedures to better integrate the Center's need for greater speed and agility in independently procuring equipment and entering into contracts. By the project's close in 2002, the PIU had become an effective technical regional entity for coordinating climate change activities and promoting them at a policy level with the region's political leadership.

Table 1: Caribbean Planning for Adaptation to Global Climate Change Project - Planned vs. Actual Disbursements by Project Component

<i>Project Cost by Component</i>	<i>At Appraisal (US\$ 000)</i>	<i>Actual (US\$ 000)</i>	<i>Actual/ Planned (%)</i>
REGIONAL ACTIVITIES			
1. Design & Installation of Sea Level Rise network	840	810	96%
2. Databases & Information Systems	392	360	92%
3. Coastal Resources Inventory System	690	630	91%
4. Policy Framework for Integrated Coastal Zone Management Planning	300	230	77%
COUNTRY-LEVEL PILOT PROJECTS:			
5. Coral Reef Monitoring Program	406	320	79%
6. Coastal Vulnerability and Risk Assessments	433	360	83%
7. Economic Valuation of Coastal Resources	312	250	80%
8. Economic/Regulatory Proposals	189	170	90%
9. Additional Start-up Activities in St. Vincent and the Grenadines ^a	-	100	-
REGIONAL PROJECT IMPLEMENTATION UNIT AND CAPACITY-BUILDING COSTS	2,084	2,070	99%
EXECUTING AGENCY (ORGANIZATION OF AMERICAN STATES) COSTS	670	680	101%
TOTAL PROJECT COST	6,300^b	6,220	99%

Source: World Bank 1997a, Schedule A, for appraisal figures and World Bank 2002, Annex 2 (Project Costs and Financing) for Actual figures.

a. An amendment to the GEF grant agreement in July 1998 augmented the grant from the original 4.4 million to 4.66 million SDR and added St. Vincent and the Grenadines as an eligible country, once they had signed the UN Framework Convention on Climate Change. b. Includes price and physical contingencies of US\$240,000 equivalent.

2.11 A ninth component was added to the project via amendment to the Grant Agreement in July 1998 for the SDR equivalent of \$349,500 to allow St. Vincent and the Grenadines to focus their efforts on developing their First National Communication once they had become signatories to the UN Framework Convention on Climate Change. This Communication included the country's climate change adaptation strategies, a greenhouse-gases inventory, and vulnerability assessments for the agriculture and water sectors. This component also contained funding for an additional sea level rise monitoring station at a cost of approximately US \$100,000. By the end of the project, since only US \$100,000 had been

disbursed under this component to install the SLR station, these other activities to develop the First National Communication were accomplished outside the project with support from the GEF-funded National Communications Support Programme implemented by the UNDP.

2.12 There was a delay of one year in implementing Component 3 due to the difficulty in contracting a coastal zone management specialist to develop a Coastal Resources Inventory System of coastal resources and uses, and to provide participating countries with greater GIS access and capabilities to present remote-sensing monitoring data to decision-makers. This inventory was intended to provide baseline data on natural resources, such as local fish populations, assessments of species of special interest such as sea turtles and manatees, and beach and coastal erosion and stability in support of other project activities. However, due to these delays and the lack of progress in delivering satellite imagery data to participating countries, mapped outputs of coastal resources and land-uses were not available to these users as expected.

2.13 The focus of the fourth component was adjusted. Originally designed to develop a generic policy framework for integrated coastal and marine zone management legislation, incorporating specific tools such as land-use guidelines and disaster contingency planning, it was re-oriented to assist countries in developing national climate change adaptation policies and implementation plans. It was recognized soon after project approval that the level of sophistication in coastal zone management planning was already well developed in the region, and that more focused attention was needed to develop climate change adaptation policies and programs instead. The main outputs of the activities under this component were national climate change adaptation policies and implementation plans as well as a regional climate change policy and strategy.

2.14 Project activities continued to be constrained by overstretched human and financial resources, limited numbers of highly skilled staff, higher than anticipated training requirements, high staff turnover, and competing agendas within other projects and agencies. These constraints limited establishing baselines and monitoring programs, data collection and analysis efforts, and information dissemination and exchange. There were also budget shortfalls caused by currency fluctuations during the project. However, most of these problems were eventually overcome and the project began working well to implement regional activities and initiatives in each country once these start-up problems were resolved.

2.15 **Safeguards.** The project was classified as an Environmental Category C project, meaning that no environmental assessment was required. It was expected to have important positive environmental effects in the long term by: (i) promoting the protection of coastal and marine resources through appropriate adaptation planning; and (ii) strengthening the regional and in-country capability to manage coastal and marine resources under the adverse conditions exacerbated by climate change. As a planning and capacity building project involving studies, training and strategy formulation, there was no actual construction or any man-made structures or imposition of prohibitions over access to natural resources. The project was not expected to have any direct impacts on specific populations. Therefore, no negative social impacts were expected to result from the project, and no social Safeguard Policies were triggered.

Monitoring and Evaluation

2.16 **Design.** A thorough and comprehensive monitoring and evaluation (M&E) Plan was prepared for the project. In Annex 12 of the Project Appraisal Document (World Bank 1997b), a table of “Indicators of Project Execution Performance” (Table 12.1) enumerates a set of eight process or progress indicators covering requirements for establishing institutions and processes, reporting progress made toward disbursement and performance targets (or deviations from these), and the timely preparation of audit reports and periodic project reports. In addition, an in-depth table of “Expected Outputs by Project Objectives” (Table 12.2) identifies 20 inputs and 35 outputs to achieve the objective, with a timeline showing start and finish dates for each of the outputs, and the expected outcomes and impacts. A table of higher-order outcome or impact “Indicators of Project Impact” (Table 12.3) has a total of 17 indicators. Finally, the technical, managerial, financial, and M&E monitoring responsibilities were enumerated for each level or “tier” of organizations involved in project implementation, such as the World Bank, OAS, the regional project implementation unit at UWICED, and the national climate change coordination committees in Table 12.4, and the various institutions responsible for submitting M&E reports with the expected content and timeline for completion were shown in Table 12.5.

2.17 **Implementation.** Despite this impressive M&E design, its implementation appears to have faltered badly during the initial project implementation phase due to poor performance by the Regional PIU and inadequate supervision by the OAS and the Bank. For example, the reporting of the 17 indicators covering the areas of improved knowledge, capacity-building, public and private involvement, and project continuity and sustainability lacked corroborating evidence to substantiate their achievement. The final report of the project was prepared by the OAS and the Regional PIU in August 2002 and provided an objective assessment of the project’s accomplishments.

2.18 **Use of the data.** The Log Frame Matrix for the project was comprised of three separate matrices corresponding to the Indicators of Project Impact and Execution Performance as well as the Output Indicators organized according to the nine project components. The M&E results were used to adjust and modify two project components and a number of activities to align them more closely with the needs and preferences of the project’s clients. While the decisions resulting from this process were not always the right decisions (such as modifying the design of the CRIS to provide participating countries with greater GIS capabilities instead of providing the necessary information to conduct the vulnerability and risk assessments or to prepare the national adaptation policies), the M&E system provided the basis upon which these decisions were made. It appears that the final report was used to make changes and adjust the follow-on project to take into consideration the situations encountered and lessons learned from the first adaptation project.

Achievement of the Project Objective

2.19 The project objective to “support Caribbean countries in preparing to cope with the adverse effects of global climate change, particularly sea level rise, in coastal and marine areas,” points to three key intermediate outcomes that were used to assess whether the project

had achieved its overall objective. The key outcomes that were expected to be achieved in this first-stage project:

- **Enhanced generation of sound scientific knowledge and access to information** that informs public policies, plans and programs on potential climate change impacts, and the vulnerability of the region’s human populations, assets, and ecosystems to them.
- **Strengthened regional and national institutions** that are better prepared to take steps to cope with the adverse effects of climate change in the region.
- **Increased public awareness and political support** regarding the need to take proactive steps to minimize climate change risks in the region.

2.20 Evidence of the delivery of project outputs and the extent to which each of these three intermediate outcomes were achieved is presented below.

FIRST OUTCOME: ENHANCED GENERATION OF SOUND SCIENTIFIC KNOWLEDGE AND ACCESS TO INFORMATION

2.21 There were four outputs aimed at generating the necessary information regarding climate change in the region to inform the public and public officials about the temporal and geographic aspects of potential climate change impacts based on the risks posed and the region’s vulnerability to them. As such, it included several key activities associated with monitoring long-term climate change conditions in the region and mobilizing that information for use in public fora. By data “mobilization,” what is meant is the whole range of activities from the generation and acquisition of data, to its processing and “scrubbing” (Quality Assurance/Quality Control), its storage and archiving, and finally its dissemination and accessibility in public discourse and policy debates informing societal decisions, policies, and behaviors.

2.22 The four outputs associated with this outcome include:

- Establishing the methods, tools, and equipment to monitor sea level rise and other meteorological trends associated with climate change on a region-wide basis;
- Systematizing and coordinating data mobilization efforts (acquisition, analysis, and dissemination) through collaborations with regional technical partners;
- Developing vulnerability risk assessments of coastal areas and resources; and
- Making the regional coral reef monitoring system in pilot countries compatible with other existing systems.

Establish the Methods, Tools, and Equipment to Monitor Sea Level Rise

2.23 Long-term sea level rise data were monitored through the installation of 17 sea level rise and climatic gauge (SLR) stations in the original 11 participating CARICOM countries (later expanded to include one more SLR station in St. Vincent and the Grenadines). The SLR monitoring network was designed with input from the National Ocean Service of the U.S. National Oceanographic and Atmospheric Administration (NOAA/NOS) and the Caribbean section of the International Oceans Commission (IOCARIBE) to meet the region’s

ocean observational monitoring needs and to be compatible with the 26 monitoring stations that had existed in the region's Global Sea Level Observation System (GLOSS). The GLOSS network did not have the regional spatial coverage desired by the designers of the project network, plus many of the stations were not functioning at that time. The SLR/climate monitoring stations were installed by the Caribbean Institute of Meteorology and Hydrology (CIMH).

2.24 The frequency with which SLR data readings were taken was once a month, which is sufficient for establishing long-term trend data, but not frequent enough for those entities forecasting near-term weather conditions or running coastal early warning systems to alert vulnerable populations or areas to impending extreme weather events like hurricanes. Due to inadequate regular maintenance, and damage from tropical storms and ships passing close by harbor jetties where the stations were installed, only 12 of the 18 SLR stations were functioning properly (meaning that they were operating and transmitting data to NOAA's GOES satellite) by the end of the project. By the time the follow-on *Mainstreaming Adaptation Project* began in 2003, it was decided that eleven new SLR stations would be needed to replace those stations installed under the original project. Since 2005, none of the original 18 SLR stations have been functional –one has disappeared, the fate of three others is “unknown,” 11 were not operational mostly due to faulty GPS clocks that were out-of-sync with the satellite uploading data from them, and three were operational, but not transmitting data (Table 2 and Annex E). In addition, due to these data quality and reliability problems, very little of the data that had been collected during the project was useable or accessible.

2.25 In addition, the project installed two geostatic landmass fixing survey (CORS) stations used to obtain “absolute” SLR measurements by eliminating any effect caused by land movements (for example, land subsidence) -- one CORS site in Jamaica and the other CORS site in Barbados. The CORS operated successfully in Jamaica, but the site in Barbados “suffered some discontinuity in measurements caused by a variety of local institutional problems.”¹⁰

¹⁰ OAS Unit for Sustainable Development and the CPACC Regional Project Implementation Unit 2002, p. 7.

Table 2. Status of Sea Level Rise Networks in the Caribbean Region (2005)

Name of Network	Responsible Agency	Number of SLR Stations	Number of Functioning SLR Stations	Percent of SLR Stations Functioning
United States National Water Level Observation System (US NWLON)	National Oceanic and Atmospheric Administration (NOAA)	14 ^a	14	100%
Planning for Adaptation Project	OAS and CIMH	18	0	0%
Other multilateral systems ^b	Various	11	1	9%
National systems ^c	Various	13	1	8%
Total		56	16	29%

Source: Caribbean Regional SLR Network Status Report, US NOAA, 24-25 February 2005.

a. NOAA's US NWLON system has 175 long-term, continuously operating water-level stations throughout the USA, 14 of which are along the southeastern coastline of the US mainland and in Puerto Rico.

b. Networks belonging to International Oceans Commission (IOC) (1), IOC/United Nations Environment Program (4), Smithsonian Institute (1), RONMAC (the SLR network for Latin America) (2), and NOAA (3).

c. National systems include Mexico (3), Cuba (3), Dominican Republic (2), Panama (1), Venezuela (2), the United Kingdom (1), France (2), Finland (1), and Curacao (1).

Systematizing and Coordinating Data Management Capabilities

2.26 Due to problems with the quality and reliability of SLR data that had been initially downloaded from the NOAA satellite by a private contracting firm hired to do the data analysis and archiving work for the project, it was decided to establish a Regional Archiving Center (RAC) at the University of the West Indies' (UWI) campus in Trinidad & Tobago under the auspices of the Centre for Geospatial Studies. This was later transferred to the Department of Survey and Land Information on the UWI campus. Monthly station status reports were then prepared each month by the RAC coordinator and sent to CIMH and to each National Focal Point and national meteorological office. In addition, the information was posted on the Internet on the RAC's website.¹¹ However, the professor in charge of running the RAC at the UWI's St. Augustine campus left the region, and the website appears to have become inactive since then.

Developing Vulnerability Risk Assessments

2.27 With regard to identifying coastal areas particularly vulnerable to the impacts of climate change in the Caribbean, there was one regional activity (the regional inventory of coastal resources and uses) and one country-level project activity (vulnerability and risk assessments) with that purpose.

¹¹ The website for the RAC is <http://www.ima-cpacc.gov.tt/>

2.28 The first of these activities, a regional workshop to develop a digitized inventory of coastal resources and uses as part of the Coastal Resources Information System (CRIS), was delayed by the lack of IKONOS satellite imagery and the requisite skills possessed by local staff in using Geographic Information System (GIS) software. The CRIS was expected to be a key input to other project activities, such as defining those coastal areas most vulnerable to climate change impacts in terms of loss of life or property, erosion and wind or wave damage from storms, decreased fishing yields due to loss of spawning areas, lower agricultural yields due to changes in rainfall, and increased flooding or landslides. A series of one-week introductory GIS training courses in data mobilization were conducted throughout the region, and a one-year certification program was offered at the Center for Resource Management and Environmental Studies at the UWI campus in Barbados. Interviews with project participants were inconclusive as to whether its use in some countries (The Bahamas, Belize, Barbados, and Jamaica) was attributable to this component of the project or due to other exogenous reasons. However, the failure to deliver many of the outputs expected from this project component had a subsequent negative impact on the preparation of coastal vulnerability and risk assessments, which were not as detailed as originally envisioned due to delays in obtaining data on baseline conditions and satellite images.

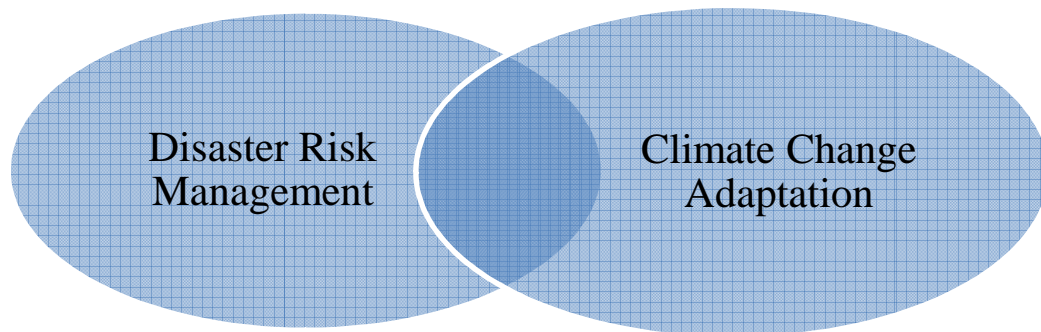
2.29 The country-level pilot project activity to conduct vulnerability and risk assessments in Barbados, Grenada, and Guyana involved comparing existing methodologies, and then selecting a harmonized approach. It involved collecting baseline information, conducting training workshops, and holding participatory stakeholder forums in order to prepare draft national climate change adaptation strategies. However, delays in obtaining the needed baseline data from the Coastal Resources Information System and IKONOS satellite imagery, coupled with a lack of available project resources for dissemination activities during the last year of the project severely hampered public awareness efforts. The difficulty of building the technical capacity to carry out vulnerability and risk assessments was greatly underestimated in terms of generating credible climate change scenarios at the regional or national level based on downscaled global climate change models, acquiring more extensive baseline data on near-shore bathymetry and contour maps, and digitized cadastral socio-economic household information. The challenges of preparing site-specific, credible assessments are daunting, and outside the normal scope of activities for climate change adaptation projects. These are traditionally done in disaster risk management projects to properly define, scale, and orient risk reduction strategies and adaptive responses.

2.30 These complementarities and distinctions between climate change adaptation and disaster risk management projects are depicted in the Box 2 below.

Box 2. The Climate Risk Management Continuum

The agendas of Disaster Risk Management and Climate Change Adaptation are converging toward each other as the former takes an increasingly preventive and preparatory approach while the latter moves increasingly into adaptation measures that overlap with disaster prevention activities, such as vulnerability and risk assessments and hardening coastal infrastructure, ecosystems, and populations.

This area of convergence is now being called the “climate risk management” by the World Bank’s Global Facility for Disaster Reduction and Recovery (GFDRR), which places Disaster Risk Management and Climate Change Adaptation in the developing world along a “continuum” of integrated climate risk management. This continuum includes activities to adjust and adapt to long-term “slow onset” changes in average climatic or geophysical conditions, such as increased sea level rise or global climate change modeling on one side while also including short-term activities taken to respond or prepare for risks and impacts in the short- to medium-term due to greater weather extremes or variability and geophysical hazards, such as hurricanes, flooding, drought, or changes in disease vectors. Reducing disaster risks is thus seen as part of a “no regrets” climate change strategy, and climate change adaptation is seen as part of the climate risk management continuum.



Source: IEG 2011.

Compatibility of Regional Coral Reef Monitoring System

2.31 Finally, the coral reef monitoring pilot program conducted in three countries (The Bahamas, Belize, and Jamaica) was designed to increase the understanding about the sources and extent of coral reef degradation due to climatic changes affecting the marine environment. Thus, this activity began by reviewing existing coral reef monitoring and research in the region, such as the Caribbean Coastal Marine Productivity (CARICOMP) Project, which had created 25 monitoring sites in 16 countries of the wider Caribbean. The methodologies and protocols of the project component were designed to ensure data compatibility. The data generated by the coral reef component was also used by Reef Base, a global repository of information on responsible coral reef management practices. An innovative video monitoring technique developed by the U.S. Geological Service in St. Johns, U.S.V.I. was adopted by the project replacing the traditional chain-transect method and was implemented through a coordinated institutional arrangement between the PIU, the

UWI, and the Coastal Zone Management Unit of Barbados. A draft sampling protocol of three representative sites in each of the three countries was developed, but could not be implemented due to limited lead agency capacity and project resources. Thus, only one target coastal marine coral reef habitat was monitored annually in the each of the three countries. It was hoped that once the value of information generated became apparent to other countries in the region that the number of coral reef monitored sites would increase. However, project budget shortfalls forced the cancellation of information exchange and dissemination workshops in the last year of the project that diminished the degree of take-up of these activities by other countries in the region.

Achievement of First Outcome – Generation and Accessibility of Sound Scientific Knowledge and Information: Modest.

2.32 Based on the fact that the network of SLR stations did not produce reliable and accurate data due to inadequate maintenance and ownership by national operators and the broader community of potential information users, that the data mobilization (RAC) functions were never consolidated within one stable and technically competent regional entity, that the outputs from the vulnerability and risk assessment activities fell far short of expectations, and that the pilot activities, such as the coral reef monitoring initiative undertaken in three countries, were not taken up by the other countries of the region, the overall rating for this first outcome is **modest**.

SECOND OUTCOME: STRENGTHENED REGIONAL AND NATIONAL INSTITUTIONS

2.33 The network of national implementation coordination units and national focal points had some success in terms of translating regional initiatives into national level programs, policies, and plans as “champions” of fledgling climate change adaptation efforts. The first set of national “issue papers” and “inception missions” were conducted with broad stakeholder participation. This output helped build the experience, expertise, and public presence and credibility of national implementation coordination units and national focal points, and put climate change adaptation on the region’s political map for the first time.

2.34 In terms of developing other human resource capacities in the region beyond the national focal points, the project had less lasting impact and had to rely on a very thin layer of highly skilled, qualified consultants, government officials, and partner organizations. Already scarce human resources were stretched even more thinly by the demands of the project’s multi-faceted design and output targets, especially in an environment where many structures and institutions were breaking new ground on cutting-edge technologies, and experiencing the “growing pains” common to innovative programs developed in response to novel situations. For example, during the first two years of the SLR monitoring network’s operation, state-of-the-art computer hardware and software programs were installed and training was provided to national staff. However, the operation of these was uneven across participating countries due to generally low technical capabilities and high turnover of staff in spite of large increases in training budgets above those estimated. By the time that the project had closed, it was determined that only three countries (The Bahamas, Jamaica, and Trinidad & Tobago) out of the 12 participating countries had sufficient in-house expertise to implement the digital SLR/climate monitoring network.

2.35 In addition to the project's own internal management infrastructure, the strategic relationships created with the CIMH, NOAA and IOCARIBE provided world-class expertise in designing, installing and operating highly specialized, state-of-the-art technical and scientific systems required to monitor and model changing climatic conditions and provide statistically reliable estimates of risks and impacts that are needed to persuade policy-makers of their gravity and move the public discourse forward in addressing climate change. This international expertise was not fully taken advantage of, as neither the project's network of SLR stations or the coral reef pilot were fully integrated with NOAA programs, such as the NOAA's National Water Level Observation Network (US NWLON) or its Coral Reef Conservation Program (CoRTAD) or Information System (CoRIS). The level of coordination with and technical peer review by other international programs were regarded as inadequate.

Achievement of Second Outcome -- Strengthened Regional and National Institutions: Modest.

2.36 In general, the scope of project activities far outstripped available resources and diluted project focus across many difficult tasks and different fields of technical expertise. Many project participants interviewed remarked that the project's achievements in strengthening national and regional institutions were diminished as a result of this expansive scope of activities. Initial start-up problems associated with building the institutional and technical capabilities of regional institutions were never resolved completely, although by the second half of the project, a more coherent and functional institutional framework to manage and plan for the impacts of climate change had begun to emerge that had not existed previously. Conversely, the national implementation coordination units and national focal points were more successful in terms of working as a network to promote fledgling climate change adaptation efforts. On balance, the achievement of this outcome was rated as **modest**.

THIRD OUTCOME: ENHANCED PUBLIC AWARENESS AND POLITICAL SUPPORT

2.37 Raising public awareness about the issue of climate change and of the need to adapt and respond to the threat it posed was acknowledged very early in the design of the project and was to be achieved throughout many of its activities. This was expressed in the initial and first National Communications of each of the 12 participating countries to the Parties of the United Nations Framework Convention on Climate Change when they stated, as Belize did that: "A recurrent theme which arose during the preparation of this First National Communication was the need to sensitize the general public and decision makers, especially the political directorate, on the potential impact of climate change on the country and on the opportunities being offered by the mechanisms of the Convention to address climate change. A comprehensive program of public awareness, education and training is required beyond that which is normally appended to sector specific projects."¹²

2.38 The principal manifestation of this effort in the project design was a policy initiative (Component 4) to formulate national policy frameworks to highlight the importance of this emerging issue (now more than a decade ago) and to begin to consider it in sector and national level policy and planning policies and programs. An Inception Mission to each

¹² Belize First National Communication to the UNFCCC, p. xi, July, 2002.

country in the region was launched in 2000 to initiate the proposed approach by engaging in an extensive consultative process with the National Focal Points and key stakeholders in the review of issues papers that had been prepared in order to fashion National Climate Change Adaptation Policies and Implementation Strategies in each country.

2.39 Ten of the 12 countries prepared Issues Papers using existing data to develop policy option matrices of expected climate risks in key sectors of the national economy, such as health, agriculture, tourism, water resources, forestry, and multi-sector issues. These served as inputs into the policy development process of each country. However, the final task in this process (to develop National Climate Change Adaptation Policies and Implementation Strategies in each country) was dropped as the available funds to the project were reduced by a decline in the US dollar value of Special Drawing Rights (SDRs), in which the grant was denominated.¹³ The elimination of dissemination events and materials negatively affected the achievement of this outcome.

2.40 In addition to this work, the project undertook two specific pilot activities to develop credible economic and policy options and proposals, and to illustrate the use of environmental valuation techniques, such as resource valuation and environmental accounting with linkages to national accounting frameworks, as inputs to the development of economic and regulatory frameworks. Regional and national personnel were trained in the use of alternative resource valuation strategies, the development of environmental accounts, and cost-benefit analysis. However, while most of the targets for outputs were met (with the exception of dissemination and training workshops that were cancelled), the practical effect of these efforts was minimal. The studies were not considered credible and were not taken seriously by policy- and decision-makers. Subsequent economic analyses of the impacts and costs associated with climate change in the region conducted by a consortium of regional and international organizations have gained greater traction as the issue has become more timely, and the scientific and economic information underlying the analysis has more credibility among decision-makers in the region.¹⁴ Activities demonstrating innovative, alternative approaches for regulating coastal and marine resources (as opposed to traditional "command and control" regulatory practices) were equally ambitious and premature, and met a similar fate. They did little to enhance the public's awareness or the political support for climate change adaptation efforts in the region.

Achievement of Third Outcome – Enhanced Public Awareness and Political Support: Modest.

2.41 A number of accomplishments that were first developed and at least partially achieved under this first adaptation project to address the challenges posed by climate change have led to increased public awareness and greater political support, but not to the degree or

¹³ OAS Unit for Sustainable Development and the CPACC Regional Project Implementation Unit 2002, p. 14.

¹⁴ There are several examples of policy documents framing the economic aspects of climate change impacts, such as *The Caribbean and Climate Change: The Cost of Inaction (2008)*, *Climate Change and the Caribbean: A Regional Framework for Achieving Development Resilience to Climate Change (2009)*, and *Modeling the Transformational Impacts and Costs of Sea Level Rise in the Caribbean – Key Points and Summary for Policy Makers (2010)*.

within the timelines expected. Almost all of the participating countries (10 out of 12) prepared National Issues Papers on the affected sectors most vulnerable to climate change impacts with a series of recommended responses. However, public education and outreach efforts were poorly coordinated with the development of technically credible, regionally relevant information about the potential impacts of climate change or the region's vulnerability to them. Baseline studies of public awareness were not conducted nor were public awareness and attitudes toward climate change and the need to pro-actively adapt to its impacts monitored during the project. When some of that information became available later in the project, there were insufficient funds to carry out dissemination events and to disseminate materials. While the threat posed by climate change and the urgent need to address it are now recognized by the region's political leaders and decision-making bodies with strong public support, this is not necessarily attributable to the project's efforts and outputs. Thus, the third outcome to enhance public awareness and political support was only **modestly** achieved.

3. Mainstreaming Adaptation to Climate Change Project (2003 – 2009)

3.1 The GEF-funded *Planning for Adaptation Project* closed in November 2002. The Canadian International Development Agency (CIDA) funded and supervised the *Adaptation to Climate Change in the Caribbean Project* between 2001 and 2003 to carry on the institutional and technical work begun under that project until the *Mainstreaming Adaptation Project* began in June 2003. This US\$3.14 million project acted as a bridging mechanism between the two GEF-financed projects. Its objectives were to: (i) assist the newly created Caribbean Community Climate Change Centre (5C) to become a sustainable institution for all climate change related activities in the region; (ii) to build adaptation to climate change into their planning and assessment processes; (iii) to strengthen the region's scientific and technical competence to address climate change issues; (iv) to ensure that national and regional involvement in international climate change negotiations was pursued; and (v) to ensure that the region's citizens, private sector, and governments had the necessary knowledge and information to support and conduct climate change response initiatives. In June 2003, CIDA transferred the remaining US\$2.0 million in project funds to the *Mainstreaming Adaptation Project* to co-finance its activities. Recognizing the long-term nature of adaptation, the UN Framework Convention had established three "stages of adaptation" designed to promote the gradual strengthening of institutional capacities, political support based on public awareness and understanding of the challenge posed, and the formulation of adaptation measures to counter the expected impacts and risks associated with climate change.

Project Objectives and Design

3.2 **Project Objective.** The second in this series of climate change adaptation projects was the US\$10.95 million *Mainstreaming Adaptation to Climate Change Project* (henceforth referred to as the *Mainstreaming Adaptation Project*). Its objective was to "facilitate the

creation of an enabling environment for climate change adaptation in CARICOM small island and coastal developing states.”¹⁵ This rather broad objective was further defined in the PAD through a number of key elements aimed at building upon the progress achieved under the preceding *Planning for Adaptation Project* by “further building institutional capacity, strengthening the knowledge base, and deepening [public] awareness and participation.”¹⁶

3.3 **Design.** The *Mainstreaming Adaptation Project* had five components continuing along similar lines to those of the preceding *Planning for Adaptation Project*:

- **Component 1: Build Capacity to Assess Vulnerability and Risks Associated with Climate Change** (US\$4.88 million). This component was designed to continue building regional capacity to collect and analyze data, and to expand the overall knowledge base on climate change impacts and associated physical, social and economic vulnerabilities. It was comprised of five sub-components: (i) strengthening the climate and coral reef monitoring network; (ii) downscaling global climate models in support of decision making for adaptation at the regional and country levels; (iii) generating climate change impact scenarios; (iv) developing a harmonized approach for assessing climate change vulnerability and risk, as an input to adaptation policy decision making; and (v) preparing vulnerability and risk assessment studies for selected countries in key economic sectors (tourism, water resources and agriculture), focusing on coastal areas.
- **Component 2: Build Capacity to Reduce Vulnerability to Climate Change** (US\$2.15 million). This component was designed to build in-country capacity to formulate and analyze adaptation policy options and finalize sector adaptation strategies for three key sectors in four countries and benefiting all 12 countries participating in the project either directly or indirectly. It was comprised of four sub-components: (i) identification of "no regrets" adaptation measures for all countries (carried out in parallel with, and informed by, the vulnerability assessment studies); (ii) development of adaptation approaches to food security, water, health and fishery sectors, and incorporation of climate change concerns relating to environmental impact assessments; (iii) development of recommendations related to upgrading technical norms for infrastructure in response to climate change concerns, including risk reduction incentives by the insurance and banking industry; and (iv) finalization of country level multi-sector adaptation strategies based on the vulnerability and risk assessment studies and outputs of the other three sub-components.
- **Component 3: Build Capacity to Effectively Access & Utilize Resources to Reduce Vulnerability to Climate Change** (US\$0.42 million). This component was to provide support for the development of a regional agenda and a regional strategy for adapting to climate change. The development of a regional agenda was intended to enhance the region's visibility and influence on relevant negotiations and policy decisions. The purpose of having a regional strategy was to improve regional coordination and harmonization on climate change adaptation and policy making, while strengthening the region's effectiveness in mobilizing and utilizing external financial resources.

¹⁵ World Bank 2003b, p. 2 and Schedule 2 of the GEF Grant Agreement (TF--051853); April 29, 2003.

¹⁶ World Bank 2003b, p. 10.

- **Component 4: Public Education & Outreach** (US\$2.10 million). The public education and outreach program was designed to improve decision-making, strengthen information access and data resources for key stakeholders, disseminate project-generated data and information, and foster public awareness about the potential impacts of climate change. It was also supposed to establish a clearinghouse of information which would facilitate both access to and dissemination of information by the stakeholders, develop and implement both regional and national public education and outreach strategies, and train the national teams in the latest techniques.
- **Component 5: Project Management** (US\$1.38 million). This component provided support to the Project Implementation Unit (originally located in the CARICOM Secretariat) to execute the project, including project administration, planning, and monitoring and evaluation (M&E) of project activities over the duration of the project. The component financed required consultancies, training, auditing, and operating costs.

3.4 **Financing.** The US\$10.95 million project was financed by a US\$5 million GEF grant with co-financing from CIDA (US\$2 million) and USAID (US \$800,000). The latter was provided as in-kind support provided by the National Oceanic and Atmospheric Administration (NOAA) to develop better climate change monitoring methods through its Climate Diagnostic Center, by deploying the Coral Reef Early Warning Stations and Continuously Operating Reference Stations (CORS), and providing technical assistance to collect data and downscale global climate change models to regional and sub-regional scales. The recipient was to provide \$3.15 million as a counterpart contribution.

3.5 **Implementation arrangements.** Under the *Mainstreaming Adaptation Project*, the CARICOM Secretariat acted as the Grant recipient and created a dedicated PIU within its Secretariat to act as the Executing Agency, which it did for the first three years of project implementation (replacing the OAS which had assumed this role under the preceding project). The PIU was responsible for carrying out the day-to-day operation and management of the project, overseeing the entire project, coordinating its myriad activities, maintaining its institutional networks, and articulating and collaborating with other project stakeholders. It was headed by a Project Manager, Technical Coordinator, Public Education & Outreach Specialist, and a full-time Economist.

3.6 A Project Advisory Committee was to be established with broad representation across governmental, donor, private sector, and non-governmental civil society groups similar to that created under the preceding project. The purpose of the Advisory Committee was to provide policy guidance to the project, and to review and evaluate its progress and results. It met once every year at the invitation of CARICOM, with technical support and progress reports provided by the PIU. Since the PIU had minimal staff, separate Memorandums of Understanding were signed with five coordinating beneficiary agencies: with CIMH to coordinate and oversee the operation of the SLR and climate monitoring network; with the UWI Mona campus Marine Studies Center to coordinate the coral reef monitoring program and Climate Studies Group at UWI Mona to coordinate the climate projection and impact assessment work; with the Faculty of Engineering of the UWI St. Augustine campus to support the operation of the Regional Archiving Center for analyzing climate change data; and with the Caribbean Disaster Emergency Response Agency (CDERA) to review and

mainstream upgraded infrastructure requirements and standards, and promote their use in disaster management, infrastructure design and construction, and property insurance practices.

3.7 The National Climate Change Coordination Committees in each participating country shared responsibility for implementing project activities with the National Focal Points, which required separate legal agreements with the CARICOM Secretariat, since these activities were conducted with project resources.

Implementation

3.8 **Planned vs. actual disbursements.** The estimated cost of the project at appraisal was US\$10.95 million, and nearly all of this amount was spent. Total actual costs were US\$10.55 million (96 percent of planned expenditure), including the contributions of the GEF, CIDA, and USAID (see Annex B). All but \$36,626 of the US\$5 million GEF grant was disbursed; the undisbursed balance was cancelled when the project closed on March 30, 2009, 18 months later than planned. Unfortunately, according to the Implementation Completion and Results Report, the CARICOM Secretariat acting as the PIU during the first three years of the project did not track expenditures by component, and it appears that the Caribbean Community Climate Change Centre, which took over the PIU two years before project closing (see below), monitored only GEF grant expenditures by component. Thus, there is no information available about actual total project expenditures by component. The extent to which resources were reallocated across components is unknown.

3.9 **Implementation experience.** The project was approved April 17, 2003, became effective June 23, 2003, and closed March 30, 2009, 18 months later than planned. The project had a complicated implementation history. At their annual meeting in 2002, the CARICOM Heads of State had endorsed the creation of a Caribbean Community Climate Change Center (the 5C) to carry on the work begun by the project implementation unit under the preceding *Planning for Adaptation Project*. Thus, it was widely assumed that the 5C would act as the Regional PIU responsible for managing the day-to-day operations and oversight functions for the new *Mainstreaming Adaptation Project*. However, during project appraisal, CARICOM, the World Bank, and project co-financiers (GEF and CIDA) had decided instead to assign project management functions to a specially created PIU within the CARICOM Secretariat on the basis of an Institutional Review conducted by the project donors. This decision, which occurred very late in the appraisal process, reflected a “consensus reached between the parties that it was premature for the 5C to assume project implementation responsibilities at this early stage of its development. The alternative arrangement of implementing the project through a dedicated PIU within CARICOM was agreed.”¹⁷ This decision was made despite the fact that the CARICOM project implementation unit had not been similarly assessed during appraisal.¹⁸ Later, this decision

¹⁷According to World Bank 2003b, p. 20, that unit had “limited experience in implementing Bank-funded projects, and therefore limited understanding of the procurement and financial management related aspects.”

¹⁸ Ibid, p. 28.

was reversed during project restructuring in the spring of 2004 following the MTR in August of the previous year.

Table 2: Mainstreaming Adaptation Project - Planned vs. Actual Disbursements by Project Component

<i>PROJECT COST BY COMPONENT</i>	APPRAISAL ESTIMATE (US\$ MILLION)		ACTUAL EXPENDITURES ^B (US\$ 000)
	PROJECT COSTS	(OF WHICH GEF GRANT)	
• Capacity to Assess Vulnerability	4.88	(2.32)	n.a.
• Build Capacity to Reduce Vulnerability	2.15	(0.73)	n.a.
• Build Capacity to Access and Utilize External Resources	0.42	(0.18)	n.a.
• Public Education & Outreach	2.11	(0.59)	n.a.
• Project Management Costs	1.31	(1.18)	n.a.
Total	10.95^a	(5.00)	10.55

Source: Annex 1 of the ICR, p. 42.

n.a.= not available. a.Includes price contingencies. b. No financial figures for total project costs by component were provided by the PIU.

3.10 Two analyses conducted in 2006 for the MTR (one by an independent consultant and the other by the World Bank), came to similar conclusions regarding the need to restructure the project to address deficiencies that had been found, such as restrictive procurement limits of \$100,000 placed on the PIU, lack of adequate financial management controls, and its failure to meet reporting requirements. The risk of project non-performance required corrective actions to be taken. The most important result of the MTR was the decision to transfer project implementation functions to the Caribbean Community Climate Change Centre (5C) from the PIU located within CARICOM by the end of 2006. However, this did not occur until April 2007, only 23 months before the project closed.

3.11 Two project components were modified at this time. Under Component 2, country-level Sector Adaptation Strategies, institutional analyses and action plans to support the implementation of those strategies were to be prepared for four countries in three key climate-affected sectors: Barbados (Tourism), Guyana (Agriculture), and Jamaica and Belize (Water), replacing the multisector plans. Another sub-component to develop technical studies to update building codes, and feasibility options for introducing risk reduction incentives through insurance was formally dropped since these activities were picked up by the Comprehensive Disaster Management Strategy developed by the Caribbean Disaster Emergency Management Agency (CDEMA), the Caribbean Catastrophe Risk Insurance Facility, and the planned Pilot Program for Climate Resilience (PPCR) Project in St. Lucia and the Caribbean region. In addition, the disbursement schedule and procurement limits were modified, and the project closing date was extended for one year from September 30,

2007 to September 30, 2008; this was later extended a second time until March 30, 2009. However, changes were not made to the project's objective or to any of the performance indicators. A final independent evaluation/review of the project was conducted in accordance with the GEF Grant Agreement, but problems associated with it severely limited data collection efforts and the report was considered unacceptable.

3.12 Safeguards. The project was classified as an Environmental Category B project, meaning that only a limited environmental assessment was required. The project was expected to have important positive environmental effects in the long term by: (i) promoting the protection of coastal and marine resources through appropriate adaptation planning; and (ii) strengthening the regional and in-country capability to manage coastal and marine resources under the adverse conditions exacerbated by climate change. There was no actual construction or any man-made structures or imposition of prohibitions over access to natural resources. The project was not expected to have any adverse impacts on specific groups or individuals. Therefore, no social Safeguard Policies were triggered.

Monitoring and Evaluation

3.13 Design. The M&E framework established six key Outcome Indicators and a list of 24 Intermediate Outcome Indicators in the Project Appraisal Document. The linkages between inputs, outputs, and outcomes indicators were very clear, and led logically to achieving the project's objective. However, the M&E system for this project was not described nearly as well in design and appraisal documents as it had been for the previous *Planning for Adaptation Project*, which had detailed individual annexes clearly spelling out the planned activities, expected outputs, and milestones for each specific project component. For example, in many cases, targets were either not given or not quantified. In addition, this large number of indicators and extensive reporting requirements imposed cumbersome and labor intensive burdens on the regional project implementation unit.

3.14 Implementation. Regular tracking of project activities and outputs as described in the M&E Plan was the responsibility of the Regional PIU. However, the PIU did not initially comply with these M&E reporting requirements, nor was it held accountable by the Bank's supervision team. This was particularly noteworthy since special attention had been paid to ensuring adequate implementation of the M&E Plan in the preparation of the project based on the experience of the previous project. However, this proved to be an elusive goal under CARICOM's project leadership. The CARICOM Secretariat was continually late and deficient in reporting progress toward project activities and disbursement of project funds in accordance with Bank requirements. This situation delayed the identification of implementation problems, which weren't corrected until 2007 when the 5C assumed project management responsibilities for the project during its last two years of implementation.

3.15 Use of the data. Prior to the Mid-Term Review, there was little information available from the M&E system that could be used by project managers and Bank supervision staff to make mid-course corrections. Following the Mid-Term Review, M&E information was used to track progress of activities toward outcome indicators in a satisfactory manner.

Achievement of Objectives

3.16 The objective of the *Mainstreaming for Adaptation* project was “to facilitate the creation of an enabling environment for climate change adaptation in CARICOM small island developing states.” This project was intended to address those challenges associated with the second stage of the 3-stage UN framework: to facilitate the creation of an enabling environment for climate change adaptation. Because this project was essentially a continuation of the *Planning for Adaptation Project*, its major intended outcomes were very similar to that project:

- **Enhanced scientific knowledge and accessibility to information that informs public policies, plans and programs** about potential climate change impacts, and the vulnerability of human populations, assets, and ecosystems to them.
- **Strengthened regional and national institutions** are better prepared to mainstream climate change adaptation plans into the policies, plans, and programs of key sectors and ministries.
- **Enhanced public awareness and political support** regarding the need to take proactive steps to minimize climate change risks in the region.

3.17 Evidence of the delivery of project outputs and the extent to which each of these three intermediate outcomes were achieved are presented below.

First Outcome: Enhanced Scientific Knowledge and Accessibility to Information that Informs Public Policies, Plans and Programs

3.18 There were a number of activities and outputs undertaken with the aim of further strengthening the regional knowledge base to address the likely impacts of climate change and reduce the region’s vulnerabilities to them, including:

- replacing the original network of 18 SLR gauge stations with 11 new stations, installing three new CORS landmass movement monitoring stations, and training local staff responsible to operate and maintain them;
- downscaling global climate change models to make them more accessible to users at a more appropriate regional and national scale and resolution for policy-making;
- increasing the number of countries with coral reef monitoring programs; and
- expanding the implementation of vulnerability and risk assessments using the methodology developed under the preceding project pilots.

3.19 By the time the *Mainstreaming Adaptation Project* became effective in 2003, it appears that none of the original 18 Sea Level Rise monitoring gauge stations were operating and reliably transmitting data to NOAA’s Geostationary Operational Environmental Satellite to be downloaded by the Regional Archiving Center for analysis, storage, and dissemination. The 11 new GPS-upgraded sea level rise stations were established, but they used technology that had already been shown to be technically deficient by the previous project. This was mostly due to the poor choice of sensor technology (acoustic Aguatrak sensors instead of radar), inadequate maintenance of equipment, and lack of a sense of ownership among

national operators and clients/users of the data being generated by the SLR network. This could have been avoided with more rigorous technical peer review processes. According to regional SLR experts contacted by IEG, the choice of acoustic sensors (such as those used for the US National Water Level Observation Network (US NWLON) along the United States coastline) was not appropriate because they require annual maintenance and calibration programs to be run by clearly designated and properly trained operators. This regular maintenance program typically costs more than ten times the amount that was set aside in the maintenance and replacement fund replenished by the project. Most of the national operators in the 12 participating countries who were generally unaware of, unprepared for, or uninterested in maintaining the stations due to the limited usefulness of the data to them. As of 2011, only three of the 11 new stations were operating and transmitting data reliably (Annex E), although three or four more are now being repaired by CIMH or NOAA, and should soon be fully functional again.

3.20 In addition, the SLR network was never fully integrated into the existing network of deep ocean and coastal observation and meteorological data collection stations in the wider Caribbean region, including the Gulf of Mexico. According to several experts contacted by IEG, the opportunity to engage the broader scientific and technical oversight community in establishing this broader network with the types of timely and relevant information that could be used by a larger client base of users was not taken full advantage of by either project, which could have been achieved at little or no cost. For instance, the frequency of SLR readings was taken only once an hour and downloaded once a month, which is sufficient for long-term tracking of sea level rise, but is not useful for early warning systems of severe weather events, which require continuous readings at least every five minutes to protect the region's populations and assets. Continuous readings could have been programmed into the original or new SLR stations at little or no additional cost to the projects. More relevant data to targeted user communities in the region might have helped lead to cost-sharing arrangements with a larger user base, according to experts.

3.21 The project downscaled existing global climate change models to a scale more appropriate and relevant to the region's nations, as planned. The 5C contracted the Climate Studies Group at the University of the West Indies' Mona campus to develop appropriate statistical and dynamic regional climate change models for the purpose of making climate change projections. These downscaled climate models were coupled with hazard models to predict the impacts of extreme events under different climate scenarios. However, following the departure of a key faculty member, there was no institutional interest in maintaining this function..

3.22 The 5C also signed a contract with CIMH to provide technical back-stopping to several of the smaller islands to help maintain their monitoring stations. However, this arrangement has not proven to be systematic enough to provide the steady data sets needed over time for effective monitoring and modeling of climate change or for other meteorological purposes. According to several regional experts, there wasn't sufficient consultation with this user community about the utility of the data collected to fully take advantage of the system since there was no systematic plan or strategy to utilize the data collected beyond the project's own purposes. While these models and scenarios can now be viewed at a sub-regional or national level on the 5C website, it is not clear how that

information is being used by other institutional users or whether the fullest possible use of that data has been achieved.

3.23 Finally, the project received co-financing support from USAID for NOAA to provide in-kind support to develop better climate change monitoring methods through its Climate Diagnostic Center, to deploy the Coral Reef Early Warning System, and install three new CORS in Antigua, Dominica, and St. Vincent and the Grenadines. The video-based monitoring protocols for the Reef Early Warning System that had been developed by the U.S. Geological Service in St. Johns, U.S. Virgin Islands, and adopted by under the previous project as pilots in The Bahamas, Belize, and Jamaica, were applied in six other countries under the project. The results of this effort between 2007 and 2009 were assessed in a report prepared by the Centre for Marine Sciences at UWI campus at Mona, Jamaica.¹⁹ This report stated that the most significant challenge facing the implementation of a regional monitoring program was the lack of sufficient personnel trained to carry out the preparatory, monitoring, and data analysis functions. The report found that participants trained to conduct these activities with support from the project had not transferred their training to other in-country personnel. As a result, “it did not appear (with the exception of Tobago) that the monitoring programme had been institutionalized and incorporated into the work programme of the respective responsible authorities.”²⁰ The report continued by stating that the “programme needs to continue to further build capacity in the countries ... to provide evidence of reef conditions to policy makers.”²¹ It was also apparent from interviews conducted by IEG that partnerships with organizations and programs such as NOAA’s National Water Level Observation Network (US NWLON) and its Coral Reef Conservation Program (CoRTAD) and Information System (CoRIS) were not adequately coordinated with by either of the two climate change adaptation projects. This not only represented a lost opportunity to leverage world-class expertise and resources, but also resulted in reduced institutionalization and sustainability of these efforts in the participating nations.

Achievement of First Outcome -- Sound Scientific Knowledge and Information that Informs Public Policies, Plans and Programs: Modest.

3.24 The second array of SLR stations installed by the *Mainstreaming Adaptation Project* did not produce data reliably, were not integrated into the broader networks of similar stations in the region, and did not continue to function properly due to inadequate maintenance and ownership by national operators and the broader community of potential information users. The data mobilization (RAC) functions were still not consolidated within a single stable and technically competent regional entity. And the coral reef monitoring training that had been provided to the pilot countries had not transferred to other in-country personnel. Only the downscaling of global climate change models to the regional and national levels was successfully completed, but even its usefulness and utility to regional decision-makers was not clearly established. Finally, regional partnerships with other

¹⁹ Coral Reef Monitoring for the Organization of Eastern Caribbean States and Tobago-Year Two: Status of the Coral Reefs, Centre for Marine Sciences, University of the West Indies at Mona, Jamaica; March 2009.

²⁰ Status of the Coral Reefs in the OECS and Tobago – Year Two, p. 40, March, 2009.

²¹ Ibid.

regional and international organizations appear to have been formed, but were not fully taken advantage of, by the project. Based on these considerations, the overall rating for this first outcome is **modest**.

SECOND OUTCOME: STRENGTHENED REGIONAL AND NATIONAL INSTITUTIONS THAT ARE BETTER PREPARED TO MAINSTREAM CLIMATE CHANGE ADAPTATION

3.25 By the time the *Planning for Adaptation Project* closed in 2003, national adaptation issues papers had been prepared for 10 out of 12 participating countries (the exceptions were The Bahamas and Grenada). Building upon these advances, the *Mainstreaming Adaptation Project* originally defined the target for the output indicator more ambitiously to produce multi-sector climate change adaptation strategies, institutional analyses, and implementation action plans in all 12 participating countries. This was considered necessary in order to “mainstream” climate change adaptation policies into the national economic development planning strategies and agencies since climate change impacts are cross-sectoral in nature. In April 2007, following the Mid-Term Review and project restructuring, the original scope was significantly reduced²² to encompass just four national sector adaptation strategies and action plans: two water sector adaptation strategies and plans in Jamaica and Belize, a tourism strategy and plan in Barbados, and an agricultural strategy and plan for Guyana. The targets for each national sector strategy also included a training program to build in-country implementation capacity in those four countries.

3.26 The four sector strategies were prepared containing institutional analyses and implementation action plans. They refined and strengthened the technical content and credibility of the “issues papers” with the addition of more precise and robust data from more in-depth impact and vulnerability assessments, downscaled regional climate change models, and country-specific climate scenarios. This increased level of predictive precision was considered necessary to persuade policy decision-makers of the need to mainstream climate change concerns into national economic and development planning policies. Training programs designed to help build implementation capacity were not carried out.

3.27 At a regional level, the project helped to increase the 5C’s growing influence and recognition as the regional center for information and policy advice related to climate change issues. For example, the 5C published “*A Regional Framework for Achieving Development Resilient to Climate Change*” in 2009 laying out a regional climate adaptation strategy until 2015. This framework is composed of four key strategies for adapting to climate change and increasing the region’s resilience to adapt to climate change. The Framework includes a regional plan to mobilize resources from new adaptation and disaster risk management funds and alliances with various donors, such as the Global Climate Change Alliance with the European Union and the UN’s Nairobi Work Program. The 5C is now in the process of preparing a detailed Implementation Plan for the Framework with timelines and budget estimates for its implementation.

²² Ministry of Tourism of Barbados. 2010. “White Paper for the Development of Tourism in Barbados.” Discussion Document

3.28 In addition, a study funded by UNDP/Barbados and OECS and prepared by the CARIBSAVE Partnership (for which the 5C provided climate modeling data) was published in 2010 entitled, “*Modeling the Transformational Impacts and Costs of Sea Level Rise in the Caribbean.*” Although the study came out after the close of the project and represented a collaborative effort among the organizations participating in the partnership, it would not have been possible to produce it without the knowledge and capacities that were strengthened by the project. Among its innovations, the analysis incorporated improved estimates of regional and sub-regional changes in sea level rise due to climate change and combined this with better information and understanding of coastal bathymetry to estimate risks and damages from storm surges. The study also included improved inventories of coastal infrastructure and other assets at risk as well as quantitative estimates of the extent and cost of structural protection works that would be required for coastal cities in the region. While it is not yet apparent what impact this study will have on changing physical planning and development policies, priorities, and actions in the region, these documents clearly demonstrated improved scientific and economic capabilities of regional institutions regarding the impacts and costs of climate change over previous analyses.

3.29 The 5C also led the effort to develop unified regional position papers (based on national position papers developed by national climate change committees and focal points) addressing the vulnerability of the region to climate change impacts and its needs for greater support from the international community that were incorporated into the Alliance of Small Island States’ (AOSIS) negotiating strategies at the Copenhagen (2009) and Cancun (2010) UN Framework global conferences on global climate change.

Achievement of the Second Outcome: Strengthened Regional and National Institutions that are Better Prepared to Mainstream Climate Change Adaptation Measures: Substantial.

3.30 Building institutional capacity requires more than just strong regional institutions. It also requires a network of capable national institutions collaborating with those specialized regional entities. Although the 5C is now widely recognized as the regional center of excellence providing highly technical scientific information to the region to address climate change issues, the national focal points and coordinating committees are most effectively positioned to inform and lobby national policy-makers. On this point, there was general agreement among the national climate change focal points interviewed that the cohesive, functional network of national climate change committees that had been successfully established by the *Planning for Adaptation Project* had had to do the best they could with less support from the project despite increased expectations and needs under the *Mainstreaming Adaptation Project*. However, the transfer of project implementation functions and responsibilities (as well as for other follow-on projects) from the CARICOM Secretariat to the 5C significantly strengthened the regional institutional base through which project outputs were achieved and further advances have been made since the project closed in 2009. On balance, the project substantially strengthened the capacity of national and regional institutions to mainstream climate change adaptation considerations into broader policy-making processes. Thus, the rating for this outcome is **substantial**.

THIRD OUTCOME – ENHANCED PUBLIC AWARENESS AND POLITICAL SUPPORT FOR CLIMATE CHANGE ADAPTATION

3.31 Little was achieved in terms of implementing a Regional Public Education and Outreach Strategy or the seven national strategies developed during the project. The national strategies had been prepared under the *Planning for Adaptation Project*, and were then completed under the Canadian-financed adaptation project between 2001 and 2003. It is unclear what additional progress was made by the *Mainstreaming Adaptation Project* to implement them once it started in mid 2003. Their effectiveness was not assessed at the end of the project.

3.32 The task of finalizing and implementing the Regional Public Education and Outreach Strategy was modified at restructuring in 2007 to target key audiences to disseminate the main project results. The IEG mission did not encounter evidence of a successful public dissemination campaign. The periodic *Mainstreaming* newsletters and *The Handbook for Journalists*, which were produced early in the project, contained generic information and did not use project-generated information about specific climate change impacts in the region; almost all of the funds for this activity had been spent before the project began generating that kind of information in the latter part of its implementation.

3.33 In terms of building political support of climate change adaptation efforts in the region, there was little evidence encountered (beyond agreeing to support the 5C and approving position papers and strategies presented at international symposia) that demonstrated strong political commitment and buy-in to adopt adaptation efforts that could be attributed to the project. For example, the original target of developing national multi-sector adaptation strategies was significantly scaled back in 2007 when the project was restructured to support a single-sector strategy in each of four countries.

3.34 The scaled-back target of preparing national sector strategies, institutional analyses, and action plans in the four pilot countries was met; in two of the countries these documents appear to have led to broader support by decisionmakers for mainstreaming climate change into sectoral policies. In Belize, the water sector strategy's recommendation to integrate adaptation considerations and specially trained personnel into the government's Integrated Water Resources Authority has been approved by the national cabinet. In Jamaica, the government agreed to create a climate change unit to coordinate adaptation activities. In that country, the recommendations from the project's sector reports are being used to guide the expansion of the monitoring network, the hydrologic data collection, and analytic efforts; those data are inputs into models and adaptation strategies, such as rainwater harvesting and artificial recharge of groundwater aquifers. According to Water Resources Authority officials, Jamaica's Water Sector Policy has not yet been reviewed, but will be cognizant of the vulnerabilities identified, the SWOT analysis, and the recommendations for action to reduce the impacts of climate change on water resources.

3.35 In contrast, in Barbados IEG found evidence of only modest tangible impacts from the sector strategy and action plan on its new tourism strategy,²³ even though the country (like Guyana, Dominica, and St. Lucia) is developing studies and initiatives promoting “no- or low-carbon growth pathways” and “resource efficiency and green economies.” There was no evidence that piloted adaptation measures to protect coastal agricultural areas in Guyana from flooding and salt water intrusion were being replicated elsewhere.

Achievement of the Third Outcome – Enhanced Public Awareness and Political Support for Climate Change Adaptation: Modest.

3.36 The progress made on the Regional Public Education and Outreach Strategy and the seven national strategies was limited, as was the utility of the periodic newsletters and *Handbook for Journalists*. There were serious gaps and shortcomings of the 5C’s information clearinghouse and website at the closing of the project; these are beginning to be addressed under a grant from the Caribbean Development Bank that provides technical assistance, but easy access to reliable and updated project documents, non-project information, and webte links continues to be problematic. There was evidence of some impact of the national sectoral strategies and action plans in Jamaica and Belize, but little evidence to suggest impacts in Barbados and Guyana. Public awareness was not monitored over the course of the project, nor was there a baseline; given the limited progress in implementing the activities to affect this outcome, it is doubtful that any improvement would have been due to the project. Therefore, the rating for this outcome is **modest**.

4. Ratings

Project Outcome

PLANNING FOR ADAPTATION PROJECT

Relevance of Objective

4.1 The objective of the *Planning for Adaptation Project* to assist the 12 participating CARICOM countries to prepare to cope with the adverse effects of climate change was **highly relevant** to the Country Assistance Strategies (CAS) of individual CARICOM member states and the umbrella CAS for the Organization of Eastern Caribbean States at the time of approval (1995) as well as at the closing of the project (2002). It has remained relevant to the Bank’s current Regional Partnership Strategy (2010). In addition, the objective of the project has remained highly relevant to successive regional strategies, as expressed in the *Barbados Plan of Action* (updated in 1999) and *Mauritius Strategy* (2005), which have increasingly identified the extreme vulnerability of the region to climate change impacts and the urgent need to strengthen its risk mitigation and adaptation capacities (that is, its resiliency) to climate change impacts.

²³ Ministry of Tourism of Barbados. 2010. “White Paper for the Development of Tourism in Barbados.” Discussion Document

Relevance of Design

4.2 The relevance of the project design to achieving its objective was **modest**. The project's components should have led logically to achieving its objectives, but there were also a number of components and activities that were not essential. These included coastal vulnerability and risk assessments, coral reef monitoring, economic valuation pilots of coastal and marine resources, and pilot studies of alternative regulatory approaches to environmental conservation efforts threatened by sea level rise.

4.3 There was some overlap with other emergency recovery and disaster risk management projects being prepared by the Bank at the same time as the *Planning for Adaptation Project* was being designed and appraised. It should have been known to those working on the adaptation project that those other disaster risk management projects were better positioned and experienced in conducting coastal vulnerability and risk assessments, and that other projects or donors might support coral reef monitoring efforts, or economic valuation and alternative incentive-based regulatory pilots that were premature for policy-making purposes. The project was simply trying to do too much with too little.

4.4 Finally, what appeared to be missing from the project design was a more explicit commitment or mechanism for raising funds to pay for the recurring costs of maintaining the SLR network of monitoring stations and data mobilization functions associated with it. Given that hurricane seasons are experienced every year in the region and that regular maintenance programs are required, a self-regenerating fund to pay for its operation and maintenance should have been established and replenished with sufficient resources to ensure the continued operation of those stations and the data mobilization system. This was implicitly acknowledged by the Bank in its design of the follow-on adaptation project, which included a separate component specifically designed to address the need to financially sustain adaptation activities and institutions in the region.

Efficacy

4.5 Based on the evidence presented in Chapter 2, the efficacy of all three project outcomes was **modest**. Under the first outcome, the scientific knowledge base was not firmly established and integrated within the existing array of other sea level rise and hydro-meteorological monitoring assets already in the region, nor was its operation and maintenance properly transferred to national entities, which did not have a sense of ownership or use for the information generated. The US \$50,000 maintenance fund established for that purpose was inadequate, and it was diverted for other uses during project implementation. As a result, the network soon began to malfunction and was not repaired or replaced with any sense of urgency.²⁴ Strategic relationships with the CIMH, NOAA and IOCARIBE to provide world-class expertise were created, but were not fully taken advantage of in terms of coordinating and integrating project assets with other existing systems and

²⁴ In a February 25, 2005 presentation given at the 9th GLOSS meeting by US NOAA, it stated that the main causes of failure of SLR networks in the Caribbean region were “usually due to a combination of factors,” which included “lack of ownership due to no perceived utility of the products [information generated], lack of local investment or institutionalization of the network, no feedback of the data, and no sense of urgency to repair” the stations; this was “especially true for the Climate Change programs.”

assets in the region. In addition, the project did not take advantage of technical peer review processes in selecting and deploying assets and systems, which led to poor decisions and a misallocation of resources dedicated to them. Thus, this outcome was only modestly achieved.

4.6 In terms of strengthening the technical capabilities of regional institutions, the Regional PIU initially established at the University of the West Indies' Centre for Environment and Development (UWICED) was never consolidated and limped along with a patchwork of temporary corrective measures to its procurement, contracting, and financial management systems, to make it through until the end of the project. By that time, the CARICOM Heads of State had already decided to formally endorse the creation of a new Caribbean Community Climate Change Centre to lead and coordinate all future climate change related activities in the region. However, its institutional development was interrupted by subsequent delays and decisions that put its consolidation as a regional leader in climate change efforts in jeopardy. Conversely, the network of national implementation coordination units and national focal points was more successful in terms of translating regional initiatives into national level programs, policies, and plans. Thus, institutional capacity in the region was created where none had existed previously. However, the new institutional capacities were not solidified and the main outputs created by the project were not widely translated into substantive changes in public strategies, policies, programs, or plans. Achievement of this outcome was **modest**.

4.7 In terms of building public awareness and political support for adaptation efforts in the region, the project prepared Issues Papers in 10 of the 12 countries using existing data to develop policy option matrices of expected climate risks in key sectors of the national economy. These served as inputs into the policy development process of each country. By the end of the project, 10 of the 12 countries had prepared national "issues papers" on climate change and adaptation strategies to prepare for its impacts in the region. These were important initial achievements that proposed incorporating an additional element in development policy-making processes and helped establish the legitimacy of the new corps of national focal points and adaptation coordination committees. The project also undertook two specific pilot activities to develop credible economic policy options and proposals, and to illustrate the use of environmental valuation techniques, but these did little to enhance public awareness or political support for climate change adaptation efforts. Dissemination activities in the last year of the project were eliminated due to funding shortfalls; in many cases where the outputs were produced, the follow-up work needed to convert them into outcomes never occurred due to the push to complete the tasks and meet the targets of the overly ambitious scope of the project. Thus, despite some important advances, the overall achievement of this outcome was **modest**.

Efficiency

4.8 No quantitative indicators of cost/benefit or cost-effectiveness were developed. However, there were a number of start-up problems associated with key implementing organizations (e.g., the Regional PIU and RAC) described in greater detail in Chapter 2 that reduced the efficient use of project resources.. For example, the delays in procuring expensive equipment with relatively low disbursement limits, inadequate training of project

staff in the Bank's financial management systems and disbursement/reimbursement procedures, and not being able to initiate project activities due to the requirement to obtain multiple levels of prior approval militated against efficient implementation of the project. As a result, implementation was uneven and slow due to overstretched local technical, organizational and managerial capabilities. Therefore, efficiency is rated as modest.

Outcome

4.9 While the relevance of the project's objective to the Bank's assistance strategies and the region's own strategic interests was high, the relevance of design to achieving the project's objective was only modest. The three outcomes were only modestly achieved and efficiency was modest due to on-going and unresolved implementation problems with the Regional PIU. Thus, there were significant shortcomings in both efficacy and efficiency, and the overall project outcome is rated as **moderately unsatisfactory**.

MAINSTREAMING ADAPTATION PROJECT

Relevance of the Objective

4.10 The *Mainstreaming Adaptation Project's* objective was **highly relevant** to addressing the Bank's development assistance agreements with the region at the time of its approval in 2003 (CAS, 2001), and has remained relevant to the Bank's regional partnership strategies over the past decade (CPS, 2010). In addition, the region's own development strategies, such as the *Mauritius Strategy*, have increasingly identified its own extreme vulnerability to climate change impacts and the urgent need to strengthen the region's resilience to climate change impacts.

Relevance of Design

4.11 The relevance of design is rated as **substantial**. It clearly articulated the linkages between project inputs and outputs, which were logically linked to achieving the desired outcomes—in terms of enhancing the scientific evidence base, regional and national capacity, and public awareness and political support. These were the enabling conditions of a Stage II project within the conceptual framework of the Intergovernmental Panel on Climate Change's three-stage approach to climate change adaptation. And the project incorporated the lessons learned from stakeholder comments regarding the preceding project's experience by strengthening local institutions, attempting to create a long-term, stable funding source, and placing more emphasis on public education and outreach efforts throughout all project activities.

4.12 The design of this second stage adaptation project was more realistic than the first stage project, given its greater resources but narrower focus on a few key expected outputs and outcomes. Multi-hazard vulnerability and risk assessments represented the centerpiece of the project's design, and the original SLR stations were replaced with 11 new, upgraded monitoring stations. The project did not include a number of unrelated separate "pilot projects" like its predecessor had done. It is also worth noting that the connection between climate change adaptation and disaster risk management as different, but complementary,

activities along an “integrated climate risk management continuum”²⁵ had become explicitly recognized within climate change circles. In addition to achieving a balance between climate change adaptation and disaster risk management, the project’s design emphasized local capacity-building and public outreach throughout all project activities. And finally, the project design incorporated a component to help the 5C develop a regional strategy and business plan to help it mobilize sources of stable and predictable external resources in the future. All these changes were improvements in the project’s design.

Efficacy

4.13 Based on the evidence presented in Chapter 3, the achievement of the first outcome under the *Mainstreaming Adaptation Project*—improving the availability of information on climate change -- is rated as **modest**. The global climate change models were successfully downscaled to the regional level and improved climate modeling data was incorporated into the sector climate change adaptation strategies and implementation plans of four countries. However, the regional knowledge base was not significantly strengthened despite the replacement of the original 18 SLR stations with 11 new monitoring stations: Only two of the 29 stations that have been installed by the projects are currently functioning and transmitting data to NOAA satellites, although three more and possibly a fourth will soon be repaired by CIMH and NOAA so that they soon become operational again. The mistakes of the first project were simply repeated again, and there was no evidence that adequate self-evaluation of learning from prior experiences or peer review had occurred. The choice of acoustic sensor technology was inappropriate, given the lack of regular maintenance and adequate training of national entities to operate the stations. Nor were the stations integrated into the larger array of SLR assets and user communities in the greater Caribbean region. Other international organizations had foreseen these problems and tried to warn the Bank’s staff, but apparently their warnings were not heeded. In addition, the data mobilization system to acquire, analyze, archive, and disseminate the monitoring data collected in a systematic and comprehensive manner was not consolidated, despite the fact that the inability of the first project to organize this function in a systematic and comprehensive manner had resulted in a lost opportunity to gather more than a dozen years of time-series SLR and meteorological data for the region. Finally, the website created to store data collected from the SLR stations appears to have been inactive for some time now, and other individuals interviewed by IEG stated that they have not been able to access this data despite repeated attempts.

4.14 The achievement of the second outcome – building institutional capacity -- is **substantial** because regional coordination and capabilities were significantly strengthened once project implementation functions and responsibilities were transferred from the CARICOM Secretariat to the 5C. The 5C’s growing expertise and recognition regionally have made further advances possible since the project closed in 2009, such as the 2010

²⁵ This term is used by the Global Facility for Disaster Reduction and Recovery (GFDRR) to describe the long-term adjustments to changing average climatic conditions that characterize climate change adaptation interventions from other short- to medium-term impacts natural hazards and impacts that are exacerbated by climate change, such as stronger sea surges and tropical storms driven by warmer ocean temperatures and higher sea levels that put more people living in vulnerable places at greater risk. The union of these two fields is referred to as “climate risk management, and other caused by extreme weather events

CaribSave publication on the *Transformational Impacts and Costs of Sea Level Rise in the Caribbean*. While this was a collaborative effort with the UNDP, UWI, and other regional institutions, it would not have been possible to have published such a credible report without the experience and capabilities developed under both of the adaptation projects. The 5C has also acted as the implementing agency for the third stage *Implementation of Adaptation Measures in Coastal and Marine Areas (SPACC) Project* that closed in December 2011. On the other hand, national coordination committees and focal points had to do the best they could with less support from the *Mainstreaming Adaptation Project* due to the phase-out of support for “enabling activities” despite increased expectations and demands on their time. On balance, institutional capacities were substantially strengthened by the project, and have remained viable since its closure.

4.15 Given the limited progress made on the Public Education and Outreach Strategy and the seven national strategies as well as the limited utility and impact of the periodic newsletters and *Handbook for Journalists* that was produced early in the project before more specific and less generic information became available, the rating for the third outcome is **modest**. In addition, improvements to the 5C’s information clearinghouse and website have been made belatedly through a Caribbean Development Bank grant to the 5C, but easy access to reliable and updated project documents, non-project information and website links remains problematic.

Efficiency

4.16 There was no cost/benefit or cost-effectiveness analysis conducted for this project. Efficiency was negatively affected by poor project implementation for the first three years of the project under the CARICOM Secretariat’s special PIU and inadequate Bank supervision. Project management responsibilities were shifted to the 5C after the Mid Term Review to address these delays and the lack of results achieved, but that transfer of project management was also delayed and no disbursements were made for six months. In addition, there was confusion over which regional entity should house the data mobilization functions for the project, and the lack of adequate and timely maintenance undermined the investment made in the new SLR stations. Originally, this was intended to be carried out by CIMH serving as the regional coordinator for the SLR monitoring network, according to the Project Appraisal Document. However, control of that function was assumed by the 5C, which can contract CIMH or other entities to carry out specific tasks. Based on all these factors, efficiency is rated as **modest**.

Outcome

4.17 The outcome of this project is rated as **moderately unsatisfactory**. The project objective was highly relevant to the Bank’s regional and bi-lateral assistance strategies as well as to the region’s own stated development strategies. The project design was substantially relevant to achieving its objective. However, the project made only modest progress toward achieving two of three expected outcomes that would have led to achieving its objective; the other outcome was substantially achieved. Efficiency was rated as modest.

Risk to Development Outcome

PLANNING FOR ADAPTATION PROJECT

4.18 The risk to development outcome rating is **significant** because of the failure of the project to ensure that the network of sea level rise and hydro-meteorological monitoring stations would continue functioning after the project ended through a program of regular maintenance, and due to the lack of stable and competent regional institutions to carry on the work of climate change adaptation beyond its closing date.

4.19 To date, no comprehensive approach to maintaining the network of sea level rise stations and integrating it into other, wider Caribbean Basin networks has been established. Without the proper functioning of these data collection and mobilization systems, the data cannot be translated into useful information for decision-makers to make policy or fiscal decisions, or for researchers seeking long-term time-series data on sea level rise and other meteorological conditions and trends. The extent of CARICOM governments' commitment to climate change adaptation efforts has been tepid, as evidenced by their unwillingness thus far to adequately maintain the SLR monitoring stations or data mobilization systems, when those systems failed to function properly.

4.20 In addition, the project did not establish stable and competent regional institutions to carry on the work of climate change adaptation beyond its closing date. What little institutional capacity had been developed up to that point was soon undermined by the long delay in launching the second adaptation project.. The respective roles and responsibilities of different regional and international institutions have still not been clearly articulated among the various technical, policy-making, and public education and outreach functions that must continue to be carried out in the region if they are to become more resilient to climate change impacts in the future.

MAINSTREAMING ADAPTATION PROJECT

4.21 The risk to development outcome rating for the MACC Project is **moderate** for several reasons. First, the regular maintenance of the SLR stations to ensure their continued functioning, and the continued lack of a comprehensive approach to ensure the analysis and archiving of monitoring data, continued to be problematic and unresolved issues. In addition, there has not been sufficient coordination and integration of these assets with other monitoring networks, scientific and technical institutions, and potential data user communities by the GEF projects to date. This has represented a missed opportunity to ensure the continuity and sustainability of project-supported outputs and services.

4.22 Secondly, while the 5C has become the region's recognized lead institution for climate change issues, just solidifying and strengthening it is not enough; a stable and predictable financial foundation is needed to allow it to program long-term activities and retain highly trained and competent staff, which is at a premium in the region. This was not achieved by the project even though its importance was recognized when a separate project component was created to access and utilize resources to reduce vulnerability to climate change impacts. In addition, well-functioning national institutions coordinating with one

another are also required to move the climate change adaptation agenda forward since that is where policies are made and program budgets are funded. In interviews with national focal points, all mentioned the gradual loss of collaboration and cohesion, country ownership, and dissemination of information regarding the experiences and lessons learned under the project, which has only accelerated under the third-stage *Implementation of Adaptation Measures in Coastal and Marine Areas (SPACC) Project*.

4.23 Thus, while the physical and economic threat posed by climate change has become more evident over the past decade to policy-makers and populations in the region, and the urgent need to address the region's vulnerability to its likely impacts has now become more widely acknowledged, there continue to be unanswered questions regarding the purposes for which data collection efforts and resources should be oriented to best serve the various user communities, and how such information can be used by policy-makers in the region. No long-term stable funding source has been identified to ensure the long-term viability and capability of regional and national-level institutions and networks. And it is not clear at this time where the resources at the scale needed to prepare for the unavoidable effects of climate change will come from in the future, or whether the region's institutions are adequately prepared to take full advantage of them.

Bank Performance

PLANNING FOR ADAPTATION PROJECT

4.24 The rating of the Bank's Quality at Entry is **moderately unsatisfactory**. Being cognizant of the limited assimilative capacity of client countries and nascent regional institutions, the designers of this first adaptation project should have better sequenced and prioritized project components and tried to limit the breadth and scope of project activities to be more manageable and achievable.

4.25 The project's justification and rationale were well-explained against the backdrop of the region's setting and international agreements/commitments that had been negotiated at the time of Board approval. As stated earlier, the project's objective was highly relevant to the region's needs and priorities. In addition, the structure of the project was clearly presented, and the M & E Plan for each project component was thoroughly explained in project preparation and appraisal documents.

4.26 The project had intentionally been designed to be comprehensive because the impacts of climate change are multi-faceted and cross-sectoral. The UN Framework's three-stage conceptual model identifies many of the activities that were undertaken as first stage activities. However, the UN model may be too ambitious and over-reaching in country contexts with limited depth of technical capacity and lack of institutional experience and awareness, such as those encountered in the Caribbean. The scope and breadth of project activities and components diluted the focus of the project away from its core mission and unique contribution of creating and maintaining a network of sea level rise and hydro-meteorological monitoring stations along with developing the data mobilization (that is, data acquisition, analysis, storage, archiving, and dissemination) system and capabilities in the region to put the information generated by the SLR stations to productive uses. For instance,

the project might have generated more than a decade's worth of time-series data on sea level rise and meteorological trends had it focused more on establishing a smaller and more manageable and integrated network of six to eight monitoring stations. As one project participant interviewed by IEG noted, "It's hard to go far when you're going in all four directions at once." For example, the five-year Caribbean Disaster Mitigation Project with funding of US\$5 million from USAID analyzed the destructive effects of coastal flooding and extreme winds experienced during tropical storms in Caribbean island states. These impacts have historically been experienced in the region on a regular basis for many centuries; what is new and different now is the exacerbation of these impacts due to warming and rising seas caused by climate change. This more specific aspect of climate risk management is what the project should have focused on.

4.27 A number of project components and activities were not essential to assisting the region to prepare to cope with the likely effects of climate change. Work on the technically challenging vulnerability and risk assessments as well as the economic valuations of coastal resources and incentive-based regulatory proposals should have been phased in under subsequent or parallel projects, as was done with the risk insurance facility component in the original project design. Although the project adhered to the UN Framework's model, it was too ambitious given the limited depth of technical capacity and lack of institutional experience and awareness present at that time in the region. There was also overlap with other emergency recovery and disaster risk management projects being prepared by the Bank at the same time that should have been known to those working on the project. The project's breadth could have been simplified either in terms of its geographic scope (that is, working in fewer countries) and/or thematic range (by dropping several national level pilots). Human and financial resources were over-stretched and proved inadequate to successfully tackle so many tasks across multiple disciplinary specialties in addition to the logistical challenges of working in a dozen countries simultaneously. As one project participant noted, "It's hard to go far when you're going in all four directions at once." Finally, what was missing from the project design was a more explicit commitment or mechanism for raising funds to pay for the recurring costs of maintaining the SLR network of monitoring stations and data mobilization functions associated with it.

4.28 Organizationally, the project management structure was also overly complex and unwieldy, including the OAS as Executing Agency, the University of the West Indies' Center for Environment and Development acting as host of the Regional PIU, the Regional PIU itself, 12 governments and NICUs, and 12 national focal points and multi-sector climate change coordination committees. However, the two-track institutional framework of having a regional coordinating "hub" working with national climate change focal points and committees did have a number of advantages, effectively combining the strengths of each track to achieve the project's objective. A number of tasks requiring highly scientific and technical skills with significant computing and data storage capacities, demanding consistent application across national borders, or common regional negotiating positions at international for a were only achievable at a regional level while tailoring actions to change laws, programs and policies can only occur at the national level.

4.29 On the other hand, it should be acknowledged that initial start-up problems associated with coordinating such a complex and ambitious project may have been more attributable to

the complex design of the project and the inherent difficulties in starting from zero with new institutions and developing novel capabilities in a developing world context. This was the first climate change adaptation novel project undertaken at a regional level in the world, so there was little previous knowledge or experience to rely upon in sorting through all of the issues involved in implementing such a complicated and multi-faceted project. Greater caution, better coordination with and peer review by other scientific institutions working in the region on the issue of climate change, and a more focused design might have been called for given the complexity, logistical/managerial challenges, and novelty of the project. For instance, with more rigorous technical review by independent, objective, and technically proficient reviewers coupled with an understanding of regional institutions and capabilities, it is unlikely that such a large array of 18 SLR stations would have been deployed, or if it had, that a more adequate maintenance system might have been implemented to ensure greater reliability and constancy of the data generated by the SLR stations and analyzed and disseminated by the Regional Archiving Center.

4.30 The Bank's Quality of Supervision is rated as **unsatisfactory**. The Bank's performance during implementation did not adequately focus on achieving results and its development objective. It was very slow to take corrective actions to remedy the low disbursement levels, very poor performance, and inadequate fiduciary controls and reporting obligations required of the Regional PIU until the Mid-Term Review two and a half years into project implementation. For example, there were a number of legal and contractual problems that arose with the Regional PIU located at the UWICED in Barbados, and unrealistically low disbursement limits of US \$100,000 caused delays in procuring expensive equipment, making it difficult for the project to disburse funds and proceed with planned project activities. These were not addressed until the Mid-Term Review when the problems had become "too obvious to ignore any longer," according to the Implementation Completion and Results Report (ICR).

4.31 In addition, there were only seven supervision missions made during the five years of project implementation, including the Mid-Term Review mission. Supervision mission reports lacked candor and did not address the concerns openly and directly. Achievement of the eight "Indicators of Project Execution Performance" and 35 "Output Indicators" was indicated with little or no explanation in the Bank's supervision reports. In many instances, the conclusions reached were not found to be credible. For example, the first "Indicator/Matrix" of "systematic data observation, monitoring, collection and analysis are effectively done and disseminated"²⁶ was reported as having been "Achieved with some shortcomings in quantity of good data and in-on-line availability." As this report has demonstrated, that characterization was far off-the-mark and misleading of the actual status of the sea level rise monitoring stations and the data mobilization efforts undertaken by the Regional Archiving Center. As a result, the quality of performance reporting and ratings was poor. Finally, the Bank did not satisfactorily ensure adequate transition arrangements either financially or institutionally to close the gap between the first and second projects.

4.32 Thus, in light of the moderately unsatisfactory quality at entry and the unsatisfactory quality of supervision, the Bank's overall performance rating is **unsatisfactory**.

²⁶ World Bank 2002, p. 18.

MAINSTREAMING ADAPTATION PROJECT

4.33 The Bank's Quality at Entry is rated as **moderately unsatisfactory**. During the project appraisal process, on the basis of an institutional assessment, it was decided that it was premature for the relatively newly formed 5C to assume project implementation responsibilities, and that the project would be implemented through a special PIU set up within the CARICOM Secretariat. However, this decision was taken without the benefit of having done a similar institutional capacity assessment of the CARICOM Secretariat. Lack of progress toward achieving intermediate outcome indicators and disbursement schedules soon made it apparent that the CARICOM Secretariat project implementation unit lacked the technical capacity and fiduciary controls to adequately manage the project.

4.34 However, to the Bank's credit, it incorporated several lessons learned from the preceding project's experience by strengthening local institutions and placing more emphasis on public education and outreach efforts throughout all project activities. There were fewer components than the previous project (5 instead of 11), but the large number of subcomponents (16) were better focused on just two main tasks: to assess and reduce the region's vulnerability to climate change impacts through adopting climate adaptation measures. And it included a new project component to help the 5C develop a regional strategy and agenda to help it mobilize sources of stable and predictable external resources in the future.

4.35 The Bank's Quality of Supervision is rated **moderately unsatisfactory**. Despite assertions to the contrary in project appraisal documents about new procedures to prevent its reoccurrence, the Bank's initial performance during the first three years of the project continued to be unacceptable, as evidenced by long gaps between supervision missions (in one case, over a year), inadequate financial management controls and procurement training, consistently late audit reports submitted without any serious consequences, and Implementation Status Reports (ISRs) that continued to give "satisfactory" or "moderately satisfactory" ratings for project performance until the Mid-Term Review provided unambiguous evidence to the contrary. The one-year delay in the Mid-Term Review equally delayed badly needed project restructuring. Following the restructuring, Bank supervision improved markedly and was effective in turning the project around.

4.36 Even at the end of the project, there was considerable confusion over whether the targets for national climate change adaptation strategies were multi-sectoral (so as to "mainstream" them into other line ministries' programs and work plans) or whether they were limited to four key economic sectors (water, agriculture, health, and fisheries). There were contradictory statements made in project documents regarding whether the scope of this component had been scaled back in a second-order amendment to the Grant Agreement by the Country Director, or if it had not been restructured, as stated in the ICR.²⁷

²⁷ In the comments section of the fourth Global Environmental Indicator, it states that: "the original goal was to develop country level multi-sectoral strategies in all countries, which was not restructured"; p. v; September 21, 2009.

4.37 Therefore, in light of the moderately unsatisfactory performance both for quality at entry and quality of supervision, the Bank's overall performance rating is **moderately unsatisfactory**.

Borrower (Recipient) Performance

PLANNING FOR ADAPTATION PROJECT

4.38 Both the OAS and the participating governments of CARICOM (which entered into formal agreements with the OAS as stipulated in the Grant Agreement) were the recipients of the GEF trust funds, and provided the political support for the project's conception, design, and implementation. In that capacity, the OAS and governments' performance is rated as **moderately satisfactory**.

4.39 The participating governments of CARICOM supported the project and promoted it throughout its conceptualization, preparation, appraisal, and implementation. They did not have to contribute any counterpart funds for this project since it was entirely financed by a GEF grant with no co-financiers. However, they did have a legal obligation in the Grant Agreement to assign adequate staff and logistical support to install the climate sensors and tidal gauges, and to maintain all the equipment provided under the Project in satisfactory condition.²⁸ They did not meet this requirement nor did the Bank hold them accountable. They were also not forthcoming with resources to compensate for the loss of nearly US \$435,000 in project resources due to the depreciation in the exchange rate of SDRs relative to the US dollar. This resulted in the cancellation of several dissemination and information exchange events and activities in the final year of the project. Although it was not a legal obligation of the governments, this would seem to demonstrate a low level of commitment to achieving the project's objective, amounting to little more than US \$36,000 per government, if divided evenly among the 12 countries.

4.40 The implementing agencies for the project were the Regional PIU and the national climate change coordination committees and focal points. Their performance is rated as **moderately satisfactory**. There were a number of logistical, operational, and financial management and procurement problems encountered at the regional project implementation unit located at the UWICED in Barbados. After addressing these initial problems, the unit carried out its functions and assisted other regional entities (e.g., CIMH and RAC) and relevant national organizations. By the project's end, the unit had developed into an "effective mechanism for coordinating climate change activities in the region with a direct link to the regional political decision-making process."²⁹ This was independently confirmed by Bank staff and several national climate change focal points interviewed by IEG.

4.41 National climate change focal points and coordinating committees were established and functioned capably. They coordinated with regional institutions, such as the Regional PIU, to promote national level initiatives, and led the preparation of the first set of national climate change adaptation issues papers for consideration by national decision-making

²⁸ Article III, Section 3.01((b)(3)(C & D) of GEF Grant Agreement (TF-028953); March 13, 1997.

²⁹ OAS and others 2002, p. 31.

bodies. They “emerged as a prominent source of expertise and advocacy for climate change issues nationally and regionally.”³⁰

4.42 Thus, the Borrowers’ overall performance, based on both the governments’ performance and the implementing agencies’ performance, is rated **moderately satisfactory**.

MAINSTREAMING ADAPTATION PROJECT

4.43 The Governments’ performance is rated as **moderately satisfactory** because the participating CARICOM governments displayed greater commitment to achieving the project’s objective of creating an enabling environment for climate change adaptation efforts in the region by meeting their counterpart contribution commitment targets (98 percent of the appraisal estimate). However, they were reluctant to ensure the continued operation and maintenance of the network of new SLR monitoring stations or data mobilization system since they maintain that those countries should bear the responsibility of paying for preventive measures or reconstruction costs associated with its impacts.

4.44 However, they did make some tough decisions in response to a number of serious problems with the performance and accountability of the Regional PIU set up within CARICOM’s own Secretariat during the first three years of the project’s implementation. Although the CARICOM governments had endorsed creating the 5C to be the regional center of excellence for climate change issues back in early 2002, they subsequently concurred with the institutional assessment conducted during the project’s appraisal that the 5C wasn’t ready to assume full project management responsibilities. However, after the first three years’ experience with the special PIU that had been created within the CARICOM Secretariat, the CARICOM Heads of States decided to abolish this unit in 2006 and agreed to establish a new Regional PIU under the 5C’s direction. This change in project implementation leadership was effected in the spring of 2007. Since then, the CARICOM governments reiterated their desire to entrust the leadership of all tasks associated with climate change as it relates to sustainable development to the 5C in 2009. The Heads of State also paid more attention and gave greater prominence to the challenges posed by climate change to the region in recognition of their countries’ vulnerability to its impacts, as demonstrated by the fact that climate change adaptation has become a permanent item on their semi-annual meeting agendas.

4.45 The implementing agencies’ performance is rated **moderately unsatisfactory**. The performance of the CARICOM Secretariat as the executing agency in the first three years of the project can only be described as unsatisfactory due to inadequate fiduciary controls and a lack of progress being made toward achieving important milestones and targets. These long delays in project implementation necessitated two extensions of the closing date of the project, and nearly resulted in the cancellation of the project for non-performance. Following the project’s restructuring after the Mid-Term Review, the project took a marked turn for the better under the leadership of the 5C, initiating long-overdue activities, tracking GEF trust fund expenditures, improving its fiduciary controls and procedures, building local capacities and partnerships, and achieving tangible results in the last two years of project

³⁰ Ibid.

implementation, such as coordinating the region's position for climate change negotiations through the development of a regional strategy. While corrective actions were eventually taken to improve the performance of the implementing agencies, these actions were taken belatedly and do not negate the earlier significant shortcomings.

4.46 Thus, taking into consideration the moderately satisfactory performance of the participating governments of CARICOM and the moderately unsatisfactory performance of the implementing agencies, the borrower's overall performance rating is **moderately unsatisfactory**

Monitoring and Evaluation

PLANNING FOR ADAPTATION PROJECT

4.47 Based on the evidence presented in Chapter 2 on the design, implementation, and utilization of the *Planning for Adaptation Project's* monitoring and evaluation, the quality of the project's M&E is rated as **substantial**.

MAINSTREAMING ADAPTATION PROJECT

4.48 Based on the evidence presented in Chapter 3 on the design, implementation, and utilization of the *Mainstreaming Adaptation Project's* monitoring and evaluation, the quality of the project's M&E is rated as **modest**.

4.49 Since the implementation of these two projects in the Caribbean, there have been advances made in developing M&E frameworks for such projects, discussed in the Epilogue in the last chapter of this report.

5. Lessons Learned

5.1 The experience to date with the first two of the three-project climate adaptation underscored four lessons with respect to climate change adaptation efforts in small island developing states of the Caribbean.

- **The UN Framework's three-stage conceptual model for sequencing activities for designing climate change adaptation efforts is comprehensive, but by compressing so many activities in the first stage of the process, it is too demanding of scarce human capital, particularly in small developing country contexts with limited absorptive capacities.** The UN's approach requires stable and predictable financial, managerial, and technical support to build local capabilities, and conservative time schedules with adequate cost contingency funds to handle unexpected difficulties. Continued refinement of the three-stage process is encouraged to focus on the core tasks of collecting long-term climate change related-data and develop the systems, models and capabilities to make that information as accessible and useful as possible to the broadest range of user communities while coordinating with disaster risk management efforts within the broader context of poverty alleviation, environmental sustainability and human development.

- **Adapting to climate change is a complex and multi-sectoral challenge requiring an integrated and collaborative approach. However, this does not have to be done all at once or within a single project if doing so makes implementation unmanageable.** Getting a few things right is better than trying to do too much and losing project focus in the process, as happened in this series of projects. The two climate change adaptation projects were overly complex in terms of their geographic scope over the entire Caribbean region, the thematic breadth of the projects crossed demanding scientific, social, and economic disciplines, and the logistical demands of coordinating activities among various institutions and jurisdictions of small island developing states presented formidable challenges. The central task and unique contribution that these projects could have made of establishing a functional network of sea level rise and hydro-meteorological monitoring stations coordinating with other existing networks and integrating its data into the different informational needs of various users communities in the region was not accomplished. Instead, the projects' focus and resources were dispersed across a number of activities that might have been better addressed by disaster risk management or other projects (such as was done with the Caribbean Climate Risk Insurance Facility (CCRIF) Project). In trying to bridge the gap between climate change adaptation and disaster risk management, these climate change adaptation projects dissipated their focus and the results they achieved suffered as a result.
- **Building complementary institutional and technical capacities at both the regional and national levels can have synergistic effects unachievable by pursuing actions at either level alone.** Activities requiring high scientific or modeling capabilities, developing harmonized approaches or technical methods to provide comparable cross-country results, or tasks requiring sophisticated computing power or storage capacity can be done more effectively in a specialized regional institution. In turn, countries are best situated to formulate and implement multi-sectoral risk management and adaptation policies and practices, disseminate information to the public and policy-makers, and promote the incorporation of such policies and practices into the operations and budgets of relevant line ministries. Nor has keeping the climate change agenda located within environmental agencies led to effective mainstreaming of these issues as an essential part of national economic planning and development policies and fiscal decisions. These countries increasingly understand the link between climate resilient policies and sustained economic development.
- **There are areas of significant overlap and potential mutual benefit to be found between disaster risk management and climate change adaptation efforts.** The agendas, methods, informational needs, and objectives of disaster risk management and climate change adaptation efforts have been converging over the past 5 – 10 years along a climate risk management continuum. It is important that each focus on specific core tasks where they have comparative advantages in expertise and experience, but they also need to find areas where their common objective of reducing climate-related risks in both the short- and long-run can produce synergies unachievable by either one alone. For example, sea level rise monitoring stations can be calibrated to acquire data that are useful for both long-term climate change modeling as well as for severe weather early

warning systems and maritime user communities. Increasing the utility of the information collected to disseminate to the broadest possible community of users in an intelligible format with appropriate terminology will add to the value of these and build local ownership and support.

5.2 What was learned from these projects was that they did not achieve their most important task and unique contribution of gathering and making accessible useful time-series data on sea level rise and hydro-meteorological data because they did not properly maintain the SLR monitoring stations. This occurred because efforts and resources were spread across too many other tasks that were either not essential or top priorities initially in terms of gathering data unattainable elsewhere at that time. Other tasks that might have been sequenced later in the three-stage process included conducting vulnerability and risk assessments and implementing the set of country-specific pilot mitigation measures, with inadequate dissemination and follow-up activities. Groups within the Bank, such as the Global Facility for Disaster Risk Reduction, should continue working to help develop a shared vision and clearer understanding of the comparative advantages and complementary roles of each approach to avoid an unhealthy organizational competition over resources. The development of the climate-resilient risk management continuum framework has been a useful step in this direction. Such efforts will become increasingly important as the focus of climate risk management activities in the region shifts away from sector strategies and emergency response toward cross-sector, economy-wide planned interventions and investments within the broader context of poverty alleviation, environmental sustainability, and human social development.

6. Epilogue

6.1 The final project in this three-stage GEF sequence of projects, the *Implementation of Adaptation Measures in Coastal Zones (SPACC) Project* (US\$ 5.44 million project supported by a US\$2.1 million GEF grant), was executed by the World Bank and implemented by the 5C. The project was approved by the Bank's Board on September 7, 2006 and became effective on February 1, 2007. Its objective is to "assist the Recipient in supporting the efforts of the Participating Countries to implement specific, integrated, pilot adaptation measures that address primarily the impacts of climate change on the Participating Countries' natural resource base, with a focus on biodiversity and land degradation along coastal and near-coastal areas." Five pilot projects are being conducted in three OECS countries in the Lesser Antilles (St. Vincent and the Grenadines, St. Lucia, and Dominica), which have adopted or are considering adopting comprehensive National Adaptation Programs of Action (NAPAs) and no- or low-carbon growth strategies for their economies. The project was restructured three and a half years later on October 9, 2010 to eliminate the technical assistance support that was going to be provided by the International Union for the Conservation of Nature (IUCN) and two pilot projects in St. Vincent and Grenadines from the project scope. The project was extended for six months, and closed in December 2011.

6.2 In 2009, the Bank launched the Pilot Program for Climate Resilience (PPCR) and announced that one of the 11 planned projects would be in the Caribbean (a project in St. Vincent and the Grenadines and Grenada combined). The planned project was designed to proceed along two tracks. First, it would pilot country-driven investments to demonstrate the integration of climate risk and resilience in core development planning processes. Second, it would undertake region-wide activities focused on climate monitoring, institutional strengthening, capacity building, and knowledge sharing. These activities were going to be initiated in the spring of 2009, immediately after the closing of the *Mainstreaming Adaptation Project*, to scale up what had already been achieved. As of November 2011, the single project had become two projects, one each in St. Vincent and the Grenadines and in Grenada, both projects had become effective, but neither had yet disbursed funds.

6.3 The clearinghouse function and library (physical and virtual) have since been upgraded at the 5C in Belize, and further enhancements are being made on a continual basis, primarily due to a Caribbean Development Bank grant with technical support provided by an information technology expert from the German Gesellschaft für Internationale Zusammenarbeit (GIZ). With regard to the weaknesses in the monitoring and evaluation systems of the *Planning for Adaptation* and *Mainstreaming Adaptation* projects, advances have been made in developing M&E frameworks for such projects. The Evaluation Office of the GEF contracted out a review and analysis of 30 recent documents on the subject and has assembled a network of M&E experts into a "community of practice" to discuss these developments with the intended aim of reaching a consensus view on building a framework of "guiding principles" for M&E of such projects in the near future.³¹ The review and

³¹ *Tracking Progress for Effective Action: A Framework for Monitoring and Evaluating Adaptation to Climate Change (Final Draft)*; Community of Practice – GEF, Haris E. Sanahuja, consultant; August, 2011.

analysis also includes consideration of the implications for disaster risk management within its conceptualization.

6.4 One of its main findings is that it is “neither possible, nor beneficial, to separate disaster risk management from adaptation to climate change”³² efforts since both share a common objective of reducing vulnerability to climate-related disasters. Both exist along a climate risk management continuum, but one (disaster risk management) is more focused on immediate disaster preparedness and response/recovery efforts, while the other (climate change adaptation) is focused on “slow onset” adverse effects and trends. But both exist on a climate compatible development path which encompasses poverty alleviation, environmental sustainability, and human development.

6.5 Three major M&E frameworks for disaster risk management and climate change adaptation projects were singled out in the report, which included:

- UNDP’s Proposed Framework for Monitoring Adaptation to Climate Change
- UNFCCC 2010: Synthesis Report on M&E for Adaptation to Climate Change; and
- IDS Sussex GEF DFID: Evaluation of Adaptation to Climate Change from a Development Perspective found in *Evaluating Climate Change and Development*.

6.6 Finally, the most recent information on the operational status of sea level rise and hydrological-meteorological monitoring stations installed in the Caribbean by the two adaptation projects indicates that only two of the 29 SLR stations installed by the projects between 1997 and 2009 are currently contributing to the Caribbean early warning system and Global Sea Level Observing System (GLOSS). By “contributing”, it is meant that they are operating properly and transmitting data to the Geostationary Operational Environmental Satellite system managed by US NOAA, the system that handles all of NOAA’s weather forecasting data collection feeds. This stands in marked contrast to the National Water Level Observation Network (US NWLON) managed by NOAA’s National Weather System where 37 out of 41 stations are currently functioning and have consistently done so during this entire period of time.

6.7 Work orders have been issued by 5C authorizing CIMH to repair/upgrade two more stations and there is a proposal for UNESCO – USA International Contributions for Scientific Educational and Cultural Activities (ICSECA) Project funding to upgrade at least one more 5C-owned station to meet regional early warning system and GLOSS standards in the near future. The medium-term regional goal, according to CIMH, is to maintain between six and eight contributing stations over the next several years. This is considered large enough to provide reliable, representative data on sea level rise across the region, yet is also manageable given existing constraints on financial and human resources.

³² Ibid, p. 4.

Annex A. Basic Data Sheet for the Caribbean Planning for Adaptation to Global Climate Change Project (TF028953)

Key Project Data (amounts in US\$ million)

	<i>Appraisal estimate</i>	<i>Actual or current estimate</i>	<i>Actual as % of appraisal estimate</i>
Total project costs	6.30	6.22	98.73
Grant amount	6.30	6.21	98.57
Cancellation	-	0.23	-

Cumulative Estimated and Actual Disbursements

	<i>FY97</i>	<i>FY98</i>	<i>FY99</i>	<i>FY00</i>	<i>FY01</i>	<i>FY02</i>	<i>FY03</i>
Appraisal estimate (US\$M)	1.9	3.4	5.0	6.3	6.3	6.3	6.3
Actual (US\$M)	0.5	1.4	2.3	4.1	5.7	6.2	6.2
Actual as % of appraisal	26	41	46	65	90	98	98

Date of final disbursement:11/07/2002

Project Dates

	<i>Original</i>	<i>Actual</i>
Concept Review	02/23/1995	02/23/1995
Negotiations	12/17/1996	12/17/1996
Board approval	03/04/1997	03/04/1997
Signing	03/13/1997	03/13/1997
Effectiveness	04/11/1997	04/11/1997
Closing date	12/31/2001	11/29/2002

Staff Inputs (staff weeks)

<i>Stage of Project Cycle</i>	<i>Actual/Estimate</i>	
	<i>No. Staff weeks</i>	<i>US\$('000)</i>
Identification/Preparation	59	151
Appraisal/Negotiation	29	50
Supervision	57	230
ICR	9	18
Total	151	444

Mission Data

<i>Stage of Project Cycle</i>	<i>No. of Persons and Specialty (e.g. 2 Economists, 1 FMS, etc.)</i>		Performance rating	
Month/Year	Count	Specialty	Implementation Progress	Development Objective
Identification/ Preparation				
9/95	2	Env. Spec. (TM); Project Asst.	-	-
11/95	2	Env. Spec. (TM); Project Asst.	-	-
1/96	2	Env. Spec. (TM); Project Asst.	-	-
2/98	1	Env. Specialist*	-	-
Appraisal				
5/96	3	Env. Spec. (TM); FM/Procurement Specialist; Climate Change Specialist	-	-
Supervision				
12/97	3	Env. Spec. (TM); 2 Operations Spec.	S	S
3/98	1	Env. Spec. (TM);	S	S
6/98	3	Env. Spec. (TM); 2 Operations Spec.	S	S
2/99	3	Chem. Engineer (new TM); 2 Operations Spec.	S	S
9-10/99 (MTR)	3	Chem. Engineer (new TM); 2 Operations Spec.	S	S
10/00	1	Chem. Engineer (TM)	S	S
5/01	3	Chem. Engineer (TM); Operations Spec. Proj. Mgt. Spec.	S	S
ICR				
10/01	1	Env. Spec.	S	S
05/02	4	Chem. Engineer TM ; Env. Spec. (2); Sector Leader	S	S

Other Project Data

Borrower/Executing Agency:

Follow-on Operations

<i>Operation</i>	<i>Credit no.</i>	<i>Amount (US\$ million)</i>	<i>Board date</i>
Mainstreaming Adaptation to Climate Change (MACC) Project	TF051853	5.00	03/04/1997

Annex B. Basic Data Sheet for the Mainstreaming Adaptation to Climate Change Project (TF051853)

Key Project Data *(amounts in US\$ million)*

	<i>Appraisal estimate</i>	<i>Actual or current estimate</i>	<i>Actual as % of appraisal estimate</i>
Total project costs	10.95	10.55	96.30
Grant amount	5.00	4.96	98.00
Cofinancing (CIDA and NOAA)	2.80	2.40	85.71
Cancellation	-	0.04	-

Cumulative Estimated and Actual Disbursements

	<i>FY03</i>	<i>FY04</i>	<i>FY05</i>	<i>FY06</i>	<i>FY07</i>	<i>FY08</i>	<i>FY09</i>	<i>FY10</i>
Appraisal estimate (US\$M)	0.8	2.4	3.6	4.8	5.0	5.0	5.0	5.0
Actual (US\$M)	0.0	0.5	1.2	2.4	3.0	3.9	4.8	4.9
Actual as % of appraisal	0.0	23.7	33.3	50.0	60.0	78.0	96.0	98.0
Date of final disbursement:10/16/2009								

Project Dates

	<i>Original</i>	<i>Actual</i>
Concept Review	05/24/2001	09/06/2001
Appraisal	01/23/2002	12/02/2002
Board approval	04/09/2002	04/17/2003
Signing	04/29/2003	04/29/2003
Effectiveness	04/15/2003	06/24/2003
Mid-term Review	07/24/2006	08/07/2006
Closing date	09/30/2007	03/30/2009

Staff Time and Cost

<i>Staff Time and Cost (Bank Budget Only)</i>		
<i>Stage of Project Cycle</i>	<i>No. of staff weeks</i>	<i>USD Thousands (including travel and consultants costs)</i>
Lending		
FY01	9.28	41.70
FY02	17.71	131.93
FY03	24.45	133.39
FY04	1.16	4.31
FY05	-	0.00
FY06	-	0.00
FY07	-	0.00
FY08	-	0.00
Total:	52.60	311.33
Supervision/ICR		
FY01	-	0.00
FY02	-	0.00
FY03	-	0.00
FY04	8.85	37.62
FY05	10.53	45.98
FY06	4.96	40.39
FY07	14.16	73.87
FY08	11.74	53.36
FY09	6.52	32.14
FY10	2.80	14.54
Total:	59.56	297.89

Task Team Members

Name	Speciality	Unit	Responsibility/ Specialty
Lending			
Benoit Blarel		LCSSES	TTL
Supervision/ICR			
Harideep Singh	Sr. Agricultural Specialist	LCSAP	TTL
Walter Vergara	Lead Engineer	LCSSEN	TTL
Fabiola Altimari Montiel	Sr. Counsel	LEGLA	
Mark A. Austin	Senior Operations Officer	LCSAR	

Name	Speciality	Unit	Responsibility/ Specialty
Edward Daoud	Consultant	IADDR	
Enzo De Laurentiis	Manager	LCSPT	
Alejandro M. Deeb	Consultant	LCSEN	
Carla Della Maggiora	Consultant	LCSTR	ICR co-author
Alfred H. Grunwaldt	ET Consultant	LCSEN	
Patricia De la Fuente Hoyes	Senior Finance Officer	LOAFC	
Judith C. Morroy	Consultant	LCSPT	
Emmanuel N. Njomo	Consultant	LCSFM	
Ian Rpy Noble	Lead Climate Change Specialist	ENV	
Enos Esikuri	Sr. Environmental Specialist	LCSEN	ICR TTL
Keiko Ashida Tao	Operations Analyst	LCSEN	ICR co-author

Other Project Data

Borrower/Executing Agency:

Follow-on Operations

Operation	Credit no.	Amount (US\$ million)	Board date
Implementation of Adaptation Measures in Coastal Zones (SPACC) Project	TF056744	2.1	09/07/2006

Annex C. Persons Interviewed

Caribbean Community Climate Change Center

Mr. Timo Bauer, Information Specialist (from GTZ under a CDB grant)

Dr. Carlos Fuller, Deputy Director

Dr. Kenrick Leslie, Executive Director

Mr. Joseph McGann, Consultant, *Mainstreaming Adaptation Project* (MACC)

Dr. Ulric Neville Trotz, Science Advisor and *Planning for Adaptation Project* (CPACC) Project Manager

CARICOM National Climate Change Focal Points

Mr. Edmund Jackson, St. Vincent and the Grenadines, MACC Project

Mr. Kishan Kumarsingh, Trinidad & Tobago, MACC Project

Mr. Clifford Mahlung, Jamaica, MACC Project

Mr. Lloyd Pascal, Dominica, MACC Project

Ms. Jocelyn Paul, Grenada, MACC Project

Mr. Rickardo Ward, Barbados, *Implementation of Adaptation Measures in Coastal Zone* (SPACC) Project

Mr. Philip Weech, The Bahamas, MACC Project

Governments

Dr. Leo Brewster, Director, Coastal Zone Management Unit of MEWRMD, Barbados

Mr. Crispin d' Auvergne, Chief Officer, Sustainable Development & Environment Division of Ministry of Physical Development and Environment, St. Lucia

Dr. Basil Fernandez, Managing Director, Water Resources Authority, Jamaica

Ms. Yvonne Hyde, CEO, Ministry of Economic Development, Belize

Ms. Dawn Pierre-Nathoniell, Project Coordinator, Sustainable Development & Environment Division of Ministry of Physical Development and Environment, St. Lucia

Other Donors

Dr. Ian King, Program Manager for Disaster Risk Reduction, UNDP

Dr. Ronaldo Murray, Program Manager for Energy and Environment, UNDP

Dr. Douglas Wilson, Oceanographer of Marine Dynamics and Chairman of IOCARIBE-GOOS Atlantic Oceanographic and Meteorological Laboratory (NOAA/AOML)

Dr. Christa G. von Hillebrandt-Andrade, Manager and President of Seismological Society of America NOAA National Weather Service Caribbean Tsunami Early Warning System Program, Puerto Rico

Institutes and Academia

Dr. David Farrell, Director, Caribbean Institute for Meteorology & Hydrology, Barbados

Dr. Leonard Nurse, Director, Centre for Environment & Development at the University of the West

Indies

The World Bank

Mr. Enos Esikuri, Senior Environmental Specialist and ICR Team Leader for MACC Project

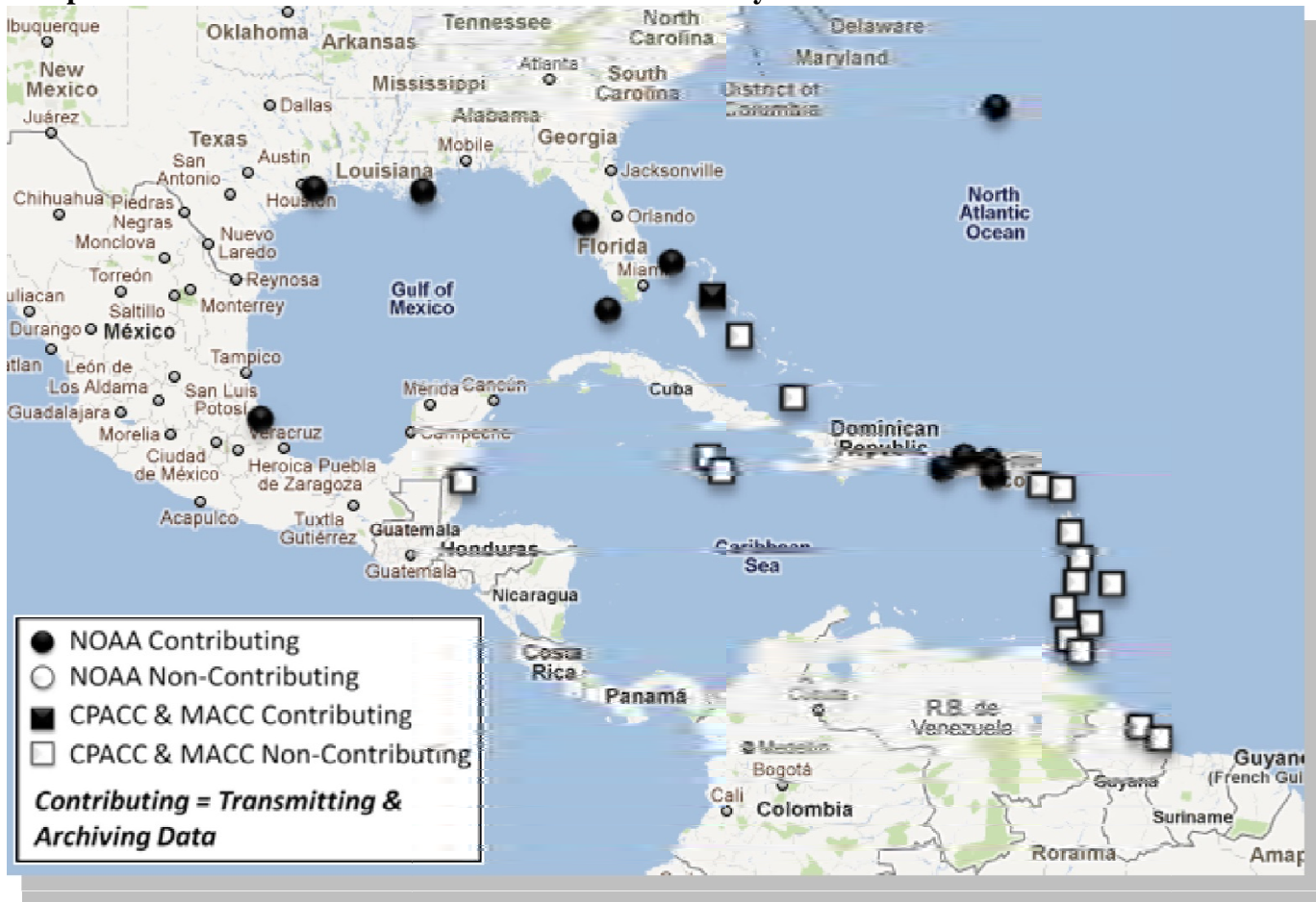
Mr. Niels Hom-Nielsen, Task Team Leader, Pilot Program for Climate Resilience Project, St. Lucia

Mr. Walter Vergara, Task Team Leader for MACC and SPACC projects

Mr. Javier Zuleta, Task Team Leader for SPACC Project

Annex D. Maps

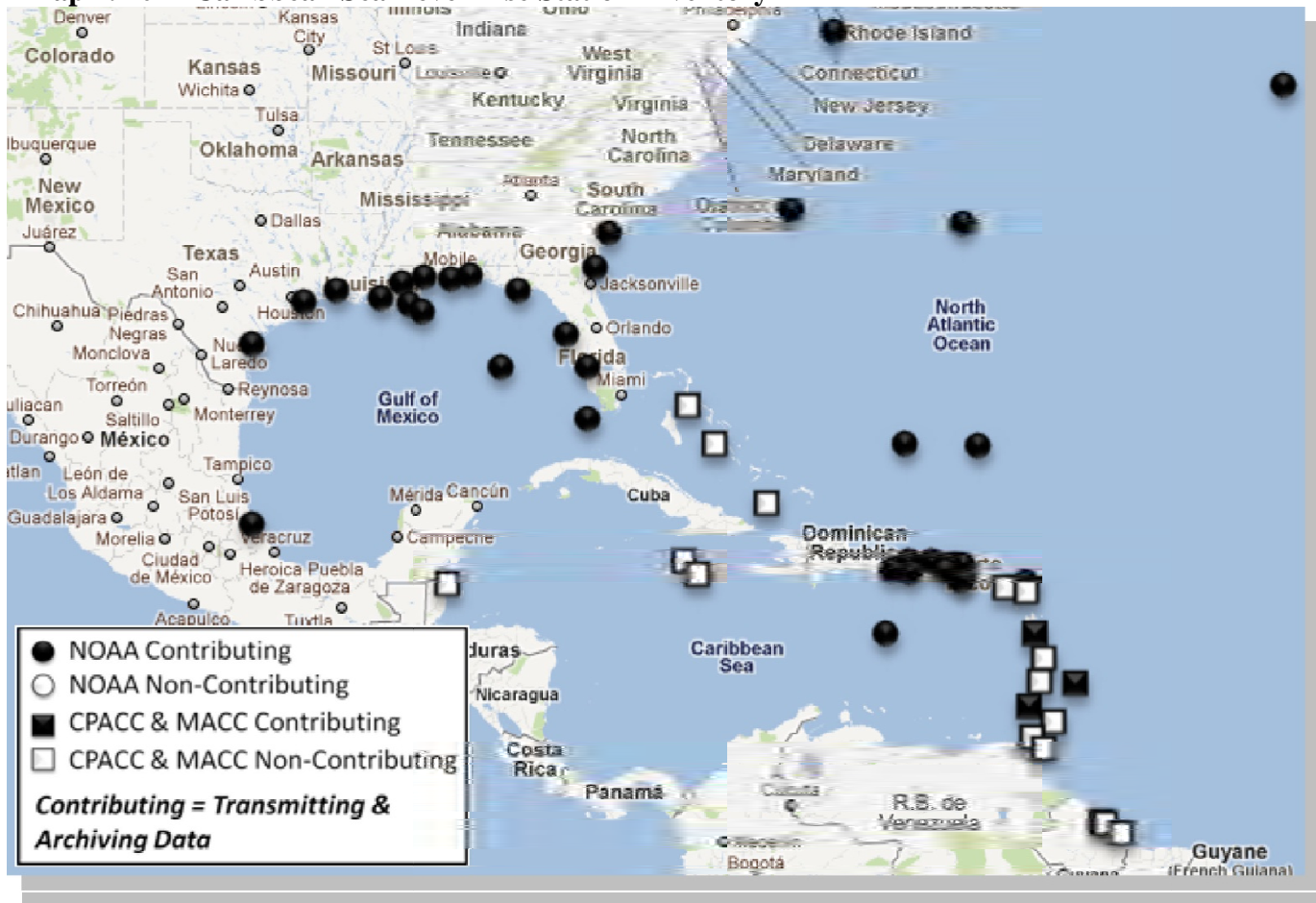
Map 1. 2005 Caribbean Sea Level Rise Station Inventory



Source: IOCARIBE/NOAA

URL: http://maps.google.com/maps?f=q&hl=en&geocode=&q=https:%2F%2Fdocs.google.com%2Fspreadsheet%2Fpub%3Fkey%3D0AiZTGck7d4x-dE5NcVUyY082SERjUEjMcHdCUTZ6SHc%26output%3Dtxt%26gid%3D0%26range%3Dkml_output%26time1%3D4079437

Map 2. 2011 Caribbean Sea Level Rise Station Inventory



Source: IOCARIBE/NOAA

URL: http://maps.google.com/maps?f=q&hl=en&geocode=&q=https:%2F%2Fdocs.google.com%2Fspreadsheets%2Fpub%3Fkey%3D0AiZTgK7d4x-dHgZVEdpNVVteWIKM0IDQ2x3UkdwYVE%26output%3Dtxt%26gid%3D0%26range%3Dkml_output%26time1%3D4079437

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