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IMPLEMENTATION COMPLETION AND RESULTS REPORT
(TF-51853)

ON A

GLOBAL ENVIRONMENT FACILITY GRANT

IN THE AMOUNT OF US$ 5.0 MILLION

TO THE

CARIBBEAN COMMUNITY /

CARIBBEAN COMMUNITY CLIMATE CHANGE CENTRE

FOR A

CARIBBEAN

MAINSTREAMING ADAPTATION TO CLIMATE CHANGE PROJECT

September 21, 2009

Sustainable Development Sector Unit
Caribbean Country Unit
Latin America and the Caribbean Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective 00000000)

Currency Unit =
1.00 = US$ [ ]
US$ 1.00 = [ ]

FISCAL YEAR

ABBREVIATIONS AND ACRONYMS

ACCC	Adaptation to Climate Change in the Caribbean
AOSIS	Alliance of Small Island States
CAS	Country Assistance Strategy
CAST	Caribbean Alliance for Sustainable Tourism
CARDI	Caribbean Agricultural Research and Development Institute
CARICOM	Caribbean Community
CCA	Caribbean Conservation Association
CCS	CARICOM Secretariat
CCCCC	Caribbean Community Climate Change Centre
CCCDF	Canadian Climate Change Development Fund
CDB	Caribbean Development Bank
CDERA	Caribbean Disaster Emergency Response Agency
CDM	Comprehensive Disaster Management
CEHI	CARICOM Environmental Health Institute
CEIS	Caribbean Energy Information System
CERMES	Center for Resource Management and Environmental Studies
CFRAMP	Caribbean Fishery Resources Assessment and Management Program
CIDA	Canadian International Development Agency
CIMH	Caribbean Institute for Meteorology and Hydrology
COP	Conference of the Parties
CORS	Continuously Operating Reference Stations
CPACC	Caribbean - Planning for Adaptation to Climate Change
CREWS	Coral Reef Early Warning Stations
CROFP	Caribbean Regional Oceans and Fisheries Program
CROPWAT	Crop-Water Requirements & Irrigation scheduling decision support
CSG	Climate Studies Group – UWI at Mona
CTO	Caribbean Trade Organization
CUBiC	Caribbean Uniform Building Code
CZMU	Coastal Zone Management Unit
DMFC	Disaster Mitigation Facility for the Caribbean
DSSAT	Decision Support System for Agro-technology Transfer Model
EIA	Environmental Impact Assessment

EEB	European Investment Bank
EMP	Environmental Management Program
EU	European Union
FAO	Food and Agriculture Organization
FINNIDA	Finnish International Development Agency
FMR	Financial Monitoring Reports
GCC	Global Climate Change
GCOS	Global Climate Observing System
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GLOSS	Global Sea Level Observing Center
GHG	Greenhouse Gasses
IADB	Inter-American Development Bank
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IICA	Instituto Interamericano para Cooperacion Agricola (Inter-American Institute for Cooperation in Agriculture)
MACC	Mainstreaming Adaptation to Climate Change
M&E	Monitoring and Evaluation
MIS	Management and Information System
MOU	Memorandum of Understanding
MTR	Mid-Term Review
NICU	National Implementation Coordination Unit
NOAA	National Oceanic and Atmospheric Administration
OAS	Organization of American States
OECS	Organization of Eastern Caribbean States
OECS-ESDU	Organization of Eastern Caribbean States - Environment and Sustainable Development Unit
PAC	Project Advisory Committee
PAHO	Pan-American Health Organization
PEO	Public Education and Outreach
PETRTRIN	Petroleum Company of Trinidad and Tobago
PIU	Project Implementation Unit
RCM	Regional Climate Modeling
SIDS	Small Island Developing States
SOE	Statement of Expenditures
SST	Sea Surface Temperature
TOR	Terms of Reference
UKCIP	United Kingdom Climate Impacts Programme
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNEP-CAR	United Nations Environment Programme - Caribbean
RCU	Regional Coordinating Unit
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
UWI Mona	University of the West Indies – Mona, Jamaica

UWI Cave Hill	University of the West Indies – Cave Hill, Barbados
UWICED	University of the West Indies Centre for Environment and Development
VCA	Vulnerability and Capacity Assessment
VAT	Value Added Tax

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Caribbean
Mainstreaming Adaptation to Climate Change Project

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D A T A S H E E T

H E R E

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1. Project Context, Global Environment Objectives and Design

(this section is descriptive, taken from other documents, e.g., PAD/ISR, not evaluative)

The objective of the Mainstreaming Adaptation to Climate Change Project (MACC) was to facilitate an enabling environment for climate change adaptation in the Caribbean Community small islands, and coastal developing states participating in this project. The 12 participating countries are: Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Cooperative Republic of Guyana, Jamaica, St. Christopher and Nevis, Saint Lucia, St. Vincent and the Grenadines, and Trinidad and Tobago. Project components would be focused on: 1) building regional capacity to collect and analyze data, thus expanding the knowledge base on climate change impacts in order to assess the associated physical, and socioeconomic vulnerabilities; 2) building in-country capacity to formulate, and analyze adaptation policy options based on vulnerability assessments, and generation of sectoral adaptation strategies for participating countries; 3) building capacity in preparation for a regional position for the United Nations Framework Convention on Climate Change (UNFCCC), and therefore providing member countries with a consolidated position in the international forum that would enhance the region's visibility on relevant policy decisions. In addition, a regional strategy would be developed, which would include the preparation of business plans, and mobilization of resources; and, 4) supporting public education and outreach programs, by strengthening information access and data resources, and, fostering public awareness, through technical assistance and capacity building.

1.1 Context at Appraisal

(brief summary of country and sector background, rationale for Bank assistance)

Sector-related country assistance strategy (CAS) goal. The objective of the project was well aligned with the goals of several CASs in the region. For example, the CAS for the Eastern Caribbean (June 2001) highlighted the serious impacts that global climate change could have on OECS small island developing states (SIDS). The CAS for Guyana clearly identified breaches of sea defenses and corresponding flooding as a threat to settlements and economic activities in coastal areas. It emphasized upgrading quality standards for road maintenance to reduce their vulnerability to natural disasters. It also suggested the development of a disaster management strategy as a key to sustainable economic development. The Jamaica CAS identified improving disaster preparedness as one of the key elements in its overall poverty reduction and economic development strategy. It articulated the need for a regional approach to disaster management, including building adequate human resource capacity to deal with such contingencies. The Trinidad and Tobago CAS suggested developing a regional agenda for dealing with disaster management and climate change impacts.

GEF Operational Criteria. The project as designed was consistent with the GEF operational criteria for enabling activities under the UNFCCCC. It was a Stage II activity, as defined under the UNFCCC and the Conference of the Parties (COP) decisions, and it was also consistent with the July 2001 guidelines issued by COP on climate change adaptation and capacity building. Stage II activities as envisaged in Article 4.1 of the

UNFCCC include "measures, including further capacity building, which may be taken to prepare for adaptation". The project focused on creating an enabling environment for climate change adaptation to occur on a sustainable basis, as part of a broader approach to sequence activities to address climate change issues. This project was designed to build on the Caribbean Community (CARICOM) Program of Adaptation initiated in 1997 with the World Bank-funded Stage I *Caribbean Planning for Adaptation to Climate Change Project* (CPACC) and the CIDA-funded Stage I *Adaptation to Climate Change in the Caribbean Project* (ACCC).

Main Sector Issues. Caribbean countries, especially the small islands and/or low-lying states, are economically, socially and environmentally vulnerable, and climate variability and change tend to exacerbate this vulnerability. Most projections at the regional level which, at the time of appraisal, were reasonably robust suggested that Caribbean countries were expected to suffer permanent climate shocks including: 1) sea level rise and higher surface air and sea temperatures, 2) extreme weather events, such as tropical storms and hurricanes, and more "El Niño-like" conditions which were also expected to become either more frequent or more severe, or both, and 3) increased intensity of rain, leading to both more frequent and more severe flooding events. These permanent shocks and changes in extreme events were expected to result in loss of livelihood, and to affect the region's resource base, damaging natural ecosystems and man-made infrastructure. These changes in the region's resource base would have direct impacts on their economies.

Over the last three decades, these countries have suffered direct and indirect losses due to natural disasters that were estimated to be between US$700 million to US$3.3 billion (2002 Report by Inter-American Development Bank on Natural Disasters in Latin America and Caribbean). An estimate of the potential economic consequences of the impacts of climate change on the economies of Caribbean countries at the time of appraisal (Haites, 2002), in a "no-adaptation" scenario, ranged from 5% to over 30% of GDP on average (annualized values) with an even broader range for some individual countries.

Those sectors at greatest risk from the anticipated deleterious impacts of climate change were tourism, agriculture, forestry, and fisheries, all of which contribute significantly to the Caribbean SIDS' economies. With poor preparedness or adoption of a reactive adaptation strategy, there is a clear risk in the event of extreme climate that the Caribbean SIDS economies might have ended up diverting scarce resources meant for development projects to relief and reconstruction from extreme climate change related disasters, therefore, setting back economic growth. Indeed following the 2004 devastation brought about by Hurricane Ivan, most Caribbean countries were forced to reallocate critical resources towards relief and reconstruction efforts.

Environmental degradation further exacerbates the socio-economic impacts of climate change. There are linkages (direct and indirect) between environmental degradation and poverty, and the low-income populations and communities that tend to be particularly adversely affected because they are usually settled on lands that are more vulnerable to

climate change related disasters (e.g., storms and floods). Limited resources or inadequate land ownership and tenure patterns tend to induce the poor to settle on unstable/steep slopes, riverbanks and low-lying coastal areas. In addition, open access to some resources, such as fishing grounds or fertile soils on volcanic slopes has prompted settlements in hazardous locations. Impacts of climate change would therefore likely be more intense for the poorer sections of the populations in these countries.

Thus, if sustainable pro-poor development was to be achieved in the SIDS' economies, these countries needed to manage the impacts emanating from expected climate change. Following the same risk management approach to natural hazards, for which there was considerable level of experience in the region, risk management of climate change required to follow three general steps: (i) risk identification (climate change vulnerability and risk assessment), (ii) risk reduction (adaptation strategy to climate change), and (iii) risk share/transfer (meet the costs of adaptation to climate change).

Main issues relating to the identification of vulnerability to climate change focused on the fact that: existing Climate Change models were global in nature; there was limited data on climate and sea-level monitoring, including monitoring of coral-reefs, which feeds into the climate change projection; the knowledge base to effectively perform climate change impact assessment on SIDS' ecosystems was weak; and human skills and institutional capacity in each of the Caribbean SIDS was inadequate.

Several factors influencing the potential for reducing vulnerability to climate change included: the perception that climate change management was the sole responsibility of government, the fact that adaptation to climate change had not been mainstreamed into the planning and development processes, the need for a coordinated multi-sectoral approach to implement the national climate change adaptation policies related to specific sectors, and the weakness of the enforcement of existing policies and programs that guide development and investment decisions.

Finally issues relating to Climate Change risk sharing and financing mechanisms which needed to be addressed included: the inability to differentiate between climate change risks (the negative) on the one hand and climate change opportunities (the good); the high cost of insurance for climate hazards (e.g., hurricanes), and the inadequate preparedness of the Caribbean countries to access UNFCCC and other financial mechanisms for climate change adaptation action at national and regional levels.

In order to address these sector issues, the project would build capacity and knowledge base, consolidating the achievements of CPACC and adopting a "learning-by-doing" approach to capacity building, to better identify climate change vulnerabilities and concomitant risk, reduce their vulnerability to climate change by focusing on building the national capacity to identify policy issues and measures for adaptation to climate change, and effectively access and utilize resources to reduce vulnerability to climate variability and change. The project would support: (a) the mainstreaming of adaptation to climate change into national and sectoral planning and policies; (b) a strong public education and outreach program, and a comprehensive communications strategy; and (c) creation of an

enabling environment for adaptation to climate change in the region. However, strengthening of the insurance sector was eventually addressed by a parallel World Bank project, the *Caribbean Catastrophe Risk Insurance Facility (CCRIF)* which became effective in May 2007. An initial 2002 attempt by the Bank to pilot this activity had failed due to the unwillingness of the OECS countries to borrow funds to cover the cost of a feasibility study. Following the 2004 devastation by Hurricane Ivan, there was a renewed interest in a Caribbean-wide catastrophe insurance pool, which then led to the initiation of CCRIF. CCRIF has effectively helped reduce the OECS countries' vulnerability to natural disasters (especially earthquakes and hurricanes) by lowering the cost of insurance.

Rationale for Bank Assistance.

Adaptation to climate change is multidimensional since it encompasses various short-term and long-term activities in different sectors. The ability of a community/country to adapt to climate change depends on the extent of climate change, as well as on available technical, financial, institutional and other capacity. Hence, adaptive capacity is influenced by a variety of factors such as education (general and specific), health care, financial resources, scientific information and understanding of climate change, availability of technologies, techniques and practical tools for various sectors and natural resources management, etc. However, adaptive capacity, in and of itself, does not guarantee adaptation actions. Adaptation occurs when in addition to adaptive capacity there is also political will and formal/institutional mechanisms that enable adaptation actions. While the whole scope of adaptation needs is not known, current knowledge is based on experience and available projections of climate change and social factors. Thus, new needs may arise that will require new adaptation strategies or urgent actions. Consequently, adaptation should be seen as a dynamic and evolving process. MACC project is a contribution to this process in the Caribbean.

The World Bank would bring to this project its considerable capacity to address climate change related environmental issues and its ability to convene governments around issues of common concern. The Bank had gained substantial knowledge on adaptation issue from the experience of implementing of the CPACC project. UNFCCC (COP1, Decision 11/CP.1) guidance has defined a three stage approach to adaptation actions. Stage I (short-term) includes studies of possible impacts of climate change, identification of particularly vulnerable countries or regions, policy options for adaptation, and capacity building. Stage II includes measures to prepare for adaptation while Stage III includes measures to facilitate adequate adaptation, including insurance, and other adaptation investments (see Figure 1).[1] Since the MACC project is a logical development from Stage I—Building awareness and strengthening knowledge base through CPACC project— to Stage II—Creation of an enabling environment for adaptation—, the Bank was ideally suited to provide support through MACC project.

[1] See Section 2.5 Post-completion Operations for the Implementation of Adaptation Measures in Coastal Zones (SPACC) Project and the Pilot Program for Climate Resilience (PPCR).

SPACC
PPCR

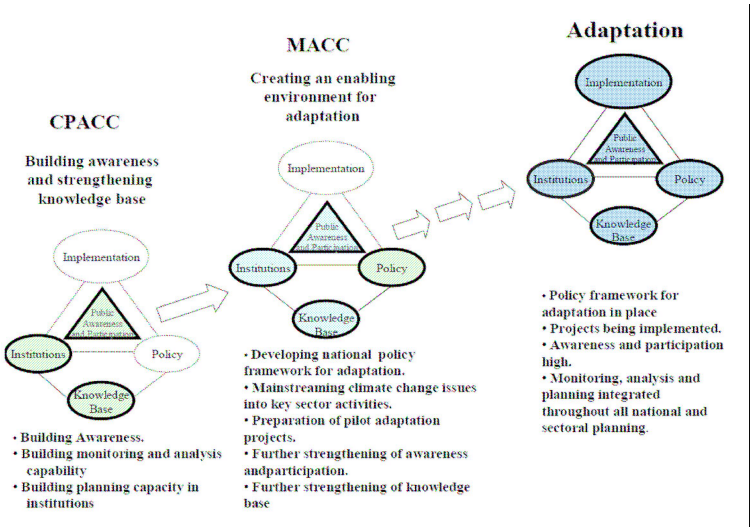

Figure 1: Three Stage Approach to Adaptation Action

The Bank would provide the recipient with access to climate change related initiatives in other regions, the sector work on adaptation by low-lying areas, and the development policies and regulations on climate change used in other regions. Likewise, the sector work on optimization of participation in the Clean Development Mechanism, undertaken under the aegis of the National Strategic Studies partnership in Colombia, Argentina, and Bolivia would be useful in the discussions leading to adoption of regional positions at the UNFCCC Conference of the Parties meetings.

Innovation and Timing

It is important to recognize that the MACC project was innovative and conceptualized at a time when climate change adaptation was barely being addressed in other Regions of the Bank or indeed outside the Bank. The project was developed at a critical time when the UNFCCC was developing a framework as part of a new round of enabling activities to assist in the preparation of second National Communications by developing countries and the National Adaptation Programmes of Action (NAPA), and to carry out the studies on Statge II adaptation. The project was one of a few post-first generation/advanced Stage II studies done in selected regions and countries[2] that offer knowledge and experience to the new round of adaptation analysis and research. Although not done under a common methodological framework, these studies have indeed moved adaptation analysis forward and have made this type of analysis part of the policy development process.

1.2 Original Global Environment Objectives (GEO) and Key Indicators (*as approved*)

[2] Pacific islands (World Bank, 2000) and Bangladesh (World Bank, 2000).

The project aimed to facilitate the creation of an enabling environment for climate change adaptation in CARICOM small island and coastal developing states. The 12 participating countries are: Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Cooperative Republic of Guyana, Jamaica, St. Christopher and Nevis, Saint Lucia, St. Vincent and the Grenadines, and Trinidad and Tobago.

The key performance indicators are:

- Strengthened regional knowledge base measured by;
  - 90% of the stations reporting with 90% reliability,
  - Wide dissemination of climate change related data and documentation,
  - Models, databases, vulnerability assessments and adaptation approach developed under the project are found useful by potential users/beneficiaries who are also willing to use them, and are assessed of satisfactory quality;
- A large constituency of sectoral specialists equipped and trained to incorporate climate change concerns into their work (vulnerability and risk assessment, economic analysis, policy aspects, adaptation options and the use of a risk management framework to determine the best options available, and the development of a strategy to implement these);
- Public awareness to climate change issues and impacts enhanced;
- National Sectoral Adaptation Strategies and Implementation Action Plans, developed in a participatory fashion with stakeholders, are presented to Cabinet, or being considered in appropriate committees/commissions[3];
- Plans prepared for more effective enforcement of existing policies and regulations, especially where these have implications for addressing climate change concerns;
- Regional coordination on climate change issues improved and access to risk sharing mechanisms like the UNFCCC increased.

Specifically, MACC as a successor project to CPACC would : (i) develop scientific knowledge and strengthen local capacity to generate and analyze scientific information, (ii) further promote public awareness on climate change, (iii) increase local capacity to undertake vulnerability assessments in key sectors, (iv) increase local capacity to develop sectoral adaptation strategies, (v) . The last two objectives serve to inform decision makers facilitating the process of mainstreaming adaptation to climate change into national policies.

1.3 Revised Global Environment Objective (GEO) (*as approved by original approving authority*) and Key Indicators, and reasons/justification

The GEO and key outcome indicators were not modified.

1.4 Main Beneficiaries

The main beneficiaries of the project include the:

[3] The project did NOT directly seek the implementation of policy or institutional reforms.

- region and the individual Caribbean SIDS and low-lying coastal countries, and the global environment, through protection of infrastructure, human life, and natural resources.
- 12 participating countries, which would use the methodologies developed and refined under the project to mainstream climate change risk management activities into national planning and development processes, and implement sectoral adaptation strategies.
- Caribbean region, which would benefit from more comprehensive climate change forecasting techniques and be better prepared for climate change related disasters. The region would also be able to benefit from pooled insurance possibilities in the light of better "self insurance" measures adopted by the public and private sectors, and a more dispersed (geographical and hazard-type) risk resulting in lower premiums for risk insurance.
- public and private sectors, which would be able to: (a) make better-informed decisions on location of infrastructure based on more accurate hazard impact data; (b) better protect assets through incorporating risk-responsive structural standards; and (c) benefit from wider insurance coverage, insurance and financing incentives, and lower insurance rates.
- populations, and in particular the coastal populations which comprise about 60% or more of the 5.2 million population in the small SIDS countries, which are particularly vulnerable to climate change risks and extreme events. In some countries (i.e. Guyana), some 90% of the population resides on the coastal plains. The implementation of national climate change adaptation strategies focusing on environmental, physical, economic and social vulnerabilities of the Caribbean SIDS, should reduce the vulnerability of this group of countries to climate change.
- donor community, which through strategic programming of resources, improved coordination in project/program implementation, and consolidation through the next level projects, would be able to achieve greater-national and regional impacts.
- regional institutions, such as CARICOM, UWI, CDERA, etc. would be strengthened through increased synergy among projects implemented in the area of climate change and disaster management.

1.5 Original Components (*as approved***)**

Component 1: Build Capacity to Assess Vulnerability and Risks Associated with Climate Change (Total US$4.88 m: GEF US$2.32 m)

This component would build regional capacity to collect and analyze data, and expand the overall knowledge base on climate change impacts and associated physical, social and economic vulnerabilities. The first four sub-components would operate at the regional level, and would focus on strengthening and expanding the knowledge base as a sound platform for analysis and decision making at the national and local levels. The fifth sub-component would draw upon the information and techniques developed under the first four sub-components.

The countries where the studies would be implemented would be selected based on an agreed set of criteria (an indicative list is provided in Annex 2 of the PAD). Non-study countries would still benefit from the vulnerability and risk assessment exercises by: (a) participating, as members, in the country teams conducting the vulnerability assessment studies to actually use the harmonized approaches, and in the dissemination and training workshops; and (b) adapting the outputs of such assessments to their own country sectoral settings to evolve appropriate sectoral adaptation strategies. The project would widely disseminate the outputs of the climate projection and impacts assessment modeling exercise, and the harmonized approach to vulnerability and risk assessment. It would build capacity by strengthening regional and national agencies and having them as coordinating agencies for identified activities, imparting information about the models and the approach to the country teams, and training these teams in their use by actual participation with expert consultants in the country level sectoral vulnerability and risk assessment studies.

Sub-components:

1.1 Strengthening the climate and coral reef monitoring network;

1.2 Downscaling global climate models in support of decision making for adaptation at the regional and country levels;

1.3 Generating climate change impact scenarios;

1.4 Developing a harmonized approach for assessing climate change vulnerability and risk, and adaptation policy decision making.

1.5 Preparing vulnerability and risk assessment studies for selected countries, or groups of countries, in key economic sectors (tourism, water resources and agriculture), focusing on coastal areas.

Component 2: Build Capacity to Reduce Vulnerability to Climate Change (Total US$2.15 m: GEF US$0.73 m)

This component would build in-country capacity to formulate and analyze adaptation policy options and finalize sectoral adaptation strategies which would be prepared for all participating countries: (i) for those countries where the vulnerability and risk assessment studies are implemented (directly), and (ii) for non-study countries (indirectly), through derived vulnerability assessments based on lessons learned from the country-level sectoral studies. The adaptation strategies for the non-study countries would be informed by the outcomes of the field-based vulnerability studies. The project would build capacity for developing adaptation strategies through training of country teams, having them participate with consultants in the actual strategy development exercise for 3 pilot sectors (i.e., agriculture, tourism and water) in 4 countries, and providing technical assistance to country teams to extend their hands-on training to develop other sector adaptation strategies in other participating countries.

Sub-components:

2.1 Identification of "no regrets" adaptation measures for all countries (carried out in parallel with, and informed by, the vulnerability assessment studies);
2.2 Development of adaptation approaches to food security, water, health and fishery sectors, and incorporation of climate change concerns relating to environmental impact assessments;
2.3 Development of recommendations relating to upgrading technical norms for infrastructure in response to climate change concerns, including risk reduction incentives by the insurance and banking industry; and
2.4 Finalization of country level multi-sectoral adaptation strategies based on the vulnerability and risk assessment studies, and inputs from the three sub-components 2.1, 2.2, and 2.3 above.

Component 3: Build Capacity to Effectively Access & Utilize Resources to Reduce Vulnerability to Climate Change (Total US$0.42 m: GEF US$0.18 m)

The objective of this component was to provide support for the development of a regional agenda and a regional strategy through two sub-components. The first sub-component would build the regional capacity to prepare a regional position for the UNFCCC and other international fora to enhance the region's visibility and influence on relevant negotiations and policy decisions. The second sub-component would assist with the development of a regional strategy to improve regional coordination and harmonization on climate change adaptation and policy making, while strengthening the region's ability to mobilize and utilize effectively financial resources provided through the UNFCCC and other external financing mechanisms.

3.1 Development of a Regional Agenda
3.2 Development of a Regional Strategy for Adaptation to Climate Change

Component 4: Public Education & Outreach (Total US$2.10 m: GEF US$0.59 m)

This component would support a public education and outreach (PEO) program geared towards improving decision-making, encouraging policy changes where required, strengthening information access and data resources for key stakeholders, disseminating project-generated data and information, and fostering public awareness about the potential impacts of climate change. Key areas of focus would be: (a) to facilitate a participatory process in the development, discussion, finalization, and dissemination of the outputs of the other project components such as climate projection and impacts assessment models, vulnerability and risk assessment strategies, adaptation strategies, technical norms and upgrading in the construction industry; and (b) establish a clearing house of information which would facilitate both access to information by the stakeholders, and dissemination of information by the PIU. The project would build capacity at the regional and national level by participatory approaches to the formulation and implementation of PEO strategies, and training the national PEO teams in the latest techniques of PEO.

Sub-components:

4.1 Finalizing the regional PEO strategy, and developing national PEO strategies;
4.2 Implementing the regional PEO strategy;
4.3 Implementing the national level PEO strategies; and
4.4 Undertaking a mid-term and final evaluation of the effectiveness of the PEO strategies, inputs and activities of this component.

Component 5: Project Management (Total US$1.38 m: GEF US$1.18 m)
This component would provide support to CARICOM and the PIU for the efficient and timely execution of the project, including project administration as well as planning, monitoring, and evaluating project activities over the duration of the project. The component would finance the required consultancies, training, auditing, and operating costs.

1.6 Revised Components

A second-order restructuring was approved in 2007. (See details under 2.2 Implementation)

Component 2. Subcomponent 2.2—Developing climate change adaptation approaches for selected sectors and upgrading EIAs—was modified to focus explicitly on a group of selected participating countries and sectors: agriculture in Guyana, tourism in Barbados, and water in Jamaica and Belize. The relevant outcome indicators were modified to reflect the scope of the activity in the four countries:

- Country-level Sector Adaptation Strategies prepared for only four countries and in specific sectors, namely Barbados (Tourism), Guyana (Agriculture), Jamaica and Belize (Water),
- Institutional analysis for implementation of the adaptation strategies in the countries and sectors specified above,
- Action Plan to support implementation fo the Country level sector adaptation strategy in selected countries and sectors as specified above,
- Training programs conducted to build capacity for adaptation plan preparation process in Barbados, Guyana, Jamaica and Belize.

Sub-component 2.3 to develop appropriate technical norms for infrastructure in response to climate change concerns, including incentives for risk reduction measures through insurance was dropped from the project. Part of this activity ws taken up by other Bank supported projects such as the Caribbean Catastrophe Risk Insurance Facility (CCRIF) Project which sought to reduce the participating country's financial vulnerability to natural disasters (earthquakes and hurricanes) by providing financing to allow participating countries to join the Caribbean Catastrophe Risk Insurance Facility.

Based on the above, the modified **Sub-component 2.2** under **Component 2**, read: *Development of climate change adaptation approaches in the following sectors and Participating Countries: (i) tourism in Barbados; (ii) agriculture in Guyana; and (iii)*

water in Jamaica and Belize based on the activities described in Part A.6(a) of the Project; (b) provision of technical assistance to the governments of Barbados, Belize, Jamaica, and Guyana in developing sector-specific adaptation strategies identified in the foregoing clause (a) and based on the results of the activities under Part A.6(a) of the Project; and (c) dissemination of the results, through meetings and publications to all Participating Countries, national focal points (climate change and GEF), and key stakeholders.

Component 4 was also slightly modified to reflect the reduced role of MACC in implementing the national PEO strategies directly in the participating countries. Instead, the project would provide support to the countries in the implementation of their national PEO programs.

1.7 Other significant changes
(in design, scope and scale, implementation arrangements and schedule, and funding allocations)

Implementation History:

The project had a complicated implementation history. MACC essentially had two lives and two separate homes (PIUs). The first half (3 years) and home (CARICOM Secretariat) of the project including Bank supervision of the project were plagued with major shortcomings in the operation in terms of implementation efficiency and achieving objectives. These shortcomings led to the restructuring of the project and transfer to a different home (PIU). The second half (last 23 months), home (Caribbean Community Climate Change Change (CCCCC) and Bank supervision of the project were markedly different and effective in turning the project around and achieving significant outcomes.

Implementation Arrangements:

Following the project's restructuring, the Caribbean Community Climate Change Center (CCCCC) was selected upon mutual agreement between the Bank and the CARICOM Secretariat (CCS) as the new MACC Project Implementing Agency and Recipient of the Grant funds, replacing CCS in its initial role. The role of the CCCCC as the coordinating agency for the region's response to climate change made it the ideal candidate to implement the Project. Moreover, the CCCCC had knowledgeable technical staff on climate issues and had successfully implemented the PDF-B for the GEF project "Implementation of adaptation measures in coastal zones", approved by the World Bank on September 07, 2006. A new institutional arrangement was approved by the Bank as part of the second-order restructuring in April 2007.

The CARICOM Secretariat continued to play an important role in the implementation of the project, by guiding the project, chairing its Project Advisory Committee, and lending necessary support when needed.

Reallocation of Proceeds:

Re-allocation of the proceeds of the GEF Trust Fund Grant was first made to take into account the modifications to the Components as a result of the Project's Mid-term review (MTR). Later, minor reallocations were made among the disbursement categories. (See Annex 1 for revised schedule).

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

(including whether lessons of earlier operations were taken into account, risks and their mitigations identified, and adequacy of participatory processes, as applicable)

Soundness of Background information

The background analysis made a clear case for the relevance of climate change in exacerbating the economic, social and environmental vulnerability of Caribbean countries. It also identified the keys issues, where the project would have an important role, in the process to assess vulnerability to climate change as well as in risk reduction and management.

Lessons from Earlier Operations

A key lesson learned and reflected in the proposed project was the sequencing of the activities to address climate change issues, given the long-term horizon over which these initiatives had to be phased in. The MACC project was designed to create an enabling environment for adaptation, building upon the results of the CPACC project—building awareness and strengthening the knowledge base. There was a crucial and immediate need to build an enabling environment to embrace climate change adaptation policies in order for the investment stage to be effectively implemented.

Another central lesson learned and reflected in the project design has to do with the fundamental need to mainstream climate change issues into national sustainable development strategies. While good progress had been made under CPACC and other projects in technical capacity building and institutional strengthening, climate change issues were still not generally a part of the mainstream policy dialogue at the national level.

A related issue is the need to expand climate change monitoring and impact assessment as a basis for national and regional decision making. CPACC and other projects in this area have underscored the need for region-specific climate models for the Caribbean in order to make more accurate projections about climate change impacts, and develop appropriate strategies in individual countries.

Other regional projects have underscored the importance of an effective regional coordination mechanism to address system-wide transboundary issues. CPACC was instrumental in taking the first step in establishing a regional network of national government agencies, private sector representatives and regional institutions addressing climate change and its effect on economic, social and cultural development in the Caribbean region.

In order to effectively mainstream climate change into development planning, strong national institutions such as the finance, planning, economic ministries and line agencies need to be involved. Keeping the climate change agendas within the environmental agencies has not led to effective mainstreaming of these issues into key development policy decisions. The project attempted to address this issue through the development of a regional policy framework, evolving sectoral policies for climate change management, setting the stage at the end of the project for multi-sectoral planning for climate change risk management, and the technical support and capacity building efforts for line ministry and national agency staff.

Assessment of Risks

Risks were identified covering those associated with the regional nature of the project, sustainability of monitoring equipment and capacity, inadequate capacity building to participate in vulnerability assessments and developing sectoral adaptation strategies, the cross-sectoral nature of climate change impacts, and institutional complexity. However, the risk matrix in the original project appraisal document did not cover the risks associated with the project's complexity, multiple actors, excessively broad scope, or weak implementation capacity. In addition, lack of experience in executing large projectst by the CARICOM Secretariat should have been identified as a high risk, and the mitigation measures put in place should have been more rigorous than those undertaken.

Finally, a further risk that was not accounted for was availability of an empowered regional coordinating unit with the capacity to convene and mobilize different stakeholders who had their own legitimate agendas, limited monetary and human resources, and capacity to manage the considerable number of activities with complex arrangements.

Adequacy of Government's commitment

Preparation of the project was participatory in nature, with all relevant agencies contributing to the project design.

Experience in CPACC had shown the high level of involvement of the different governments on the issue of climate change. Specifically, governments had committed resources to assign National Focal Points[4] and National Implementation Coordinating Units. Also, under the United Nations Development Programme (UNDP) Enabling Activities project, all participating countries had completed their first National Communications. All of these communications identified adaptation to climate change as a high priority issue for the region, and supported the regional approach adopted for implementation of CPACC; this same approach is the one followed in MACC Project.

[4] The National Focal Points for MACC are the same persons as the UNFCCC Focal Points except for Antigua.

At the national level, the initial national communication reports from CARICOM countries requested support for a second regional project (as a follow-up to CPACC), to continue capacity building and technical assistance in the area of climate change, and to further strengthen the adaptation process.

At the regional level, therefore, the CARICOM Heads of Government approved a resolution during their meeting in July 2000, authorizing the then implementation team of the CPACC project to submit a request to the GEF to support the development of a full proposal to continue the process of adaptation. The CARICOM Heads of Government also endorsed a resolution calling for the establishment of institutional capacity to champion adaptation policies and to coordinate climate change activities in the region.

Assessment of the project design

As earlier noted, it is recognized that mainstreaming adaptation to climate change is a continuous process that will require constant effort and strong ownership by different countries and regional institutions. As such the project was designed to fill considerable gaps and to play a key role in contributing to this process.

Components were clearly defined and each component has a specific target reflecting the lessons learnt from previous operations with the common objective of advancing the process of mainstreaming adaptation to climate change considerations into country policy, planning and development processes.

Nevertheless, the project design was overly-ambitious for the existing capacity of the recipient and the government counterparts. The project intended to carry out too many activities which made execution cumbersome for the Recipient. Furthermore, the regional nature of the project added complexity to the execution of the project.

Even if climate change had been recognized by all countries as an important issue in their development agenda, it was still not at the forefront, and therefore, there was a chance that stakeholders would not be as empowered (financial resources, capacity, and technical inputs) as needed in the implementation of the activities supported by the project.

2.2 Implementation
(including any project changes/restructuring, mid-term review, Project at Risk status, and actions taken, as applicable)

Key Findings of the MTR

In August 2006, representatives of the CARICOM Secretariat including the PIU staff, the Caribbean Community Climate Change Centre, and the World Bank met in Barbados and conducted the MTR. The key findings were as follows:

- The project objective to mainstream adaptation to climate impacts into the development process remained valid and more urgent than ever.
- The project was significantly behind schedule, as it was reflected in a slow disbursement rate and delay in achieving important results as measured by key indicators. The delays were caused mainly by (i) slow disbursement due to CARICOM Secretariat's internal processes and complex communication protocols; (ii) delay in filling the vacancy of Technical Coordinator up until the

MTR; (iii) some services and equipment for monitoring provided by the co-financier were delayed beyond control of the project; (iv) difficult access to required baseline data to develop climate change scenarios, (v) underestimation of the time necessary for completion of the climate change model runs, and (vi) slow and difficult communication between, and participation of, key stakeholders executing the project.

- By the time of MTR, half of the project resources had already been spent, but the achieved progress was not commensurate with the resources expended.
- An independent assessment commissioned by the CARICOM Secretariat concluded that corrective actions were required to bring the project back on schedule and to reduce the risk of non-performance.
- Country participation and the identification of local champions would be essential for success in field activities and for the formulation of adaptation policy options, sectoral adaptation strategies and vulnerability and risk assessment.
- Public Education and Outreach remained central to the mainstreaming objective. But remaining resources are not commensurate with the work yet to be completed.
- A one year extension of the closing date to September 2008 would be necessary to achieve the project objectives.

Restructuring of the project

As a result of the MTR, the CARICOM Secretariat and the World Bank with the concurrence of the CCCCC agreed and implemented the following corrective actions:

- Slightly revised components (as described in section 1.6 above);
- Revised management structure: CARICOM Secretariat and the Bank agreed to transfer project execution responsibilities to the Caribbean Community Climate Change Center in Belize.
- CARICOM Secretariat would continue to guide the project and chair its Project Advisory Committee which was also decided to be restructured in order to speed up their decision-making process.[5]
- Revised project staffing: The revised structure was designed to take advantage of the existing tasks of the CCCCC and to keep a lean management structure. The project supported a junior technical assistant and procurement staff, and financial management staff. Administrative support was provided by the CCCCC.
- Public Education and Outreach program targeted key audiences to disseminate main project results instead of implementation of the developed strategy.
- Extension of the closing date (to September 2008)
- Revised work plan produced, which emphasized activities in the field and engagement of local partners (champions) who were considered essential for success in field activities and in particular to formulate and facilitate the

[5] The restructuring included a higher-level involvement of the CARICOM Secretariat in order to speed up decision-making. Also, the meetings were chaired by the Secretariat.

mainstreaming recommendations of the vulnerability and risk assessments, adaptation policy options, and sectoral adaptation strategies for selected countries.

Implementation in general after the Restructuring

Project implementation improved under the CCCCC as the executing agency. The rate of disbursements picked up as formally revised during the restructuring. The CCCCC and the Bank exercised frequent assessment of progress through monthly audio conferences and frequent missions. The progress report prepared by the project manager of the CCCCC provided information on the status of implementation, disbursement and commitments of all activities supported by the project, as well as the identification of key issues, tasks and bottlenecks, for which the task team would take immediate action to help resolve.

Second Extension of Closing Date: The transfer of Special Account from the CARICOM Secretariat to the CCCCC was delayed, consequently delaying the full execution of the activities by the latter. In the meantime, the CCCCC used their own funds to continue carrying out some of the activities until the transfer was completed and they started receiving funds from the Bank. However, this delay affected the rate of implementation, and a second extension of the closing date was required to complete the priority activities. A six-month extension until March 2009 was requested and granted. But it turned out that even this second extension was not adequate to allow the finalization of certain project activities that required more time to obtain results, such as the development of regional linkage of the national sector strategies and the implementation of national sector adaptation strategies.

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

M&E Design

The M&E framework aimed to integrate output progress monitoring and project impact evaluation. The linkage between output and outcome indicators was very clear, and M&E of the former would lead to a proper monitoring of progress toward the achievement of the latter.

Indicators were generally appropriate. However, the large number of activities supported by the project required cumbersome and labor intensive monitoring requirements that invariably increased the workload of the PIU. A more simplified project design and the setting up of a more efficient M&E, e.g., systematized, less intense and less frequent reporting, would have been more effective.

Monitoring of all activities was designed to be carried out on a regular basis through a combination of: (i) PIU annual and semi-annual progress reports (including reporting on the progress achieved compared to the timeline of project activities, procurement plan, and annual work plan); (ii) technical reports linked to the specific activities to be reviewed by independent consultants for technical, social, economic and policy aspects when required by the PIU; (iii) self assessment by trainees on the quality of the training, relevance and, usefulness “on-the-job” in reference to staff capacity building; and (iv) and Bank supervisions. The M&E framework also considered conducting a full-scale

annual review on project implementation in addition to supervision missions, as well as midterm and end-of-project review.

M&E Implementation

The M&E was not effectively implemented partly because the CARICOM Secretariat did not have a dedicated full-time project team, which delayed the identification of the major implementation problems in the first half of the project life.

Following the restructuring, the CCCCC worked closely with the Bank to revise technical and fiduciary documentation, which consequently reduced the uncertainty about data quality in the PIU's progress reports and technical reports. Technical reports were further enhanced through a peer review process.

The MTR proved to be a key step in the process of M&E. Both the MTR by an independent consultant and the one by the Bank reached similar conclusions and were crucial in determining the changes that were neededto bring the project back on track.

Finally, an end-of-project independent review was conducted by a consultant. However, data collection during this exercise was limited because the consultant could not travel due to his passport situation. The consultant only managed to visitthe CARICOM Secretariat in Guyana and also participated in the end-of-project symposium. The rest of the data collection was made through phone calls. Therefore, the quality of the report prepared by the consultant was deemed inadequate and of limited use.

M&E utilization

The M&E utilization by both the Recipient and the Bank in the first half of the project was at best weak. Consequently the implementation teams overlooked various opportunities to take corrective measures in project execution. The poor utilization of M&E in the first half of the project contributed to delayed identification of critical implementation problems in the first half of the project life. Consequently, the project experienced significant lapses in execution that necessitated not only second-order restructuring, but also two subsequent project extensions. However following the MTR, all decisions throughout the project were based on the available information provided by the PIU, technical reports and aide memoirs from supervision missions. This is reflected for example in the decision that was taken, after the MTR, to restructure the project.

The project generated reliable data, however not at the pace or quality defined in the PAD. That was especially the case for progress reports. After MTR, a more close and regular supervision that relied on mutually agreed upon and simplified progress reports facilitated the monitoring of implementation.

2.4 Safeguard and Fiduciary Compliance
(focusing on issues and their resolution, as applicable)

No environmental and social safeguards were triggered by the project, which was classified as a category C.

On fiduciary compliance, the assessment found that procurement capacity of the CCCCC was quite weak initially. For example, required documentation was usually not on file, bidding and evaluation periods often extended beyond the time specified in the Requests

for Proposal, and there were some instances where a no-objection from the Bank was obtained after the contract had been issued. After the Bank procurement specialist visited the CCCCC to provide training to the CCCCC staff, the situation did improve tremendously. Following this training, the Bank task team was therefore in a position to provide continuous guidance to ensure compliance with the Bank's procedures and guidelines which enhanced the overall quality of procurement management.

Although the financial management reports (FMRs) and the audit reports were found satisfactory in general, these were often presented late to the Bank. The last project audit report covering an extended period of time (2008 and 2009) is still pending.

2.5 Post-completion Operation/Next Phase

(including transition arrangement to post-completion operation of investments financed by present operation, Operation & Maintenance arrangements, sustaining reforms and institutional capacity, and next phase/follow-up operation, if applicable)

Operation and Maintenance Arrangements

Equipments supported by the project will be sustained through operation and maintenance agreements between the CCCCC and other project partners for CORs (UWI-DSLI, Department of Survey and Land Information, St. Augustine, Trinidad and Tobago) and sea level monitoring stations (CIMH). There is no agreement in place for CREWS but operation and maintenance will be covered under a comprehensive agreement currently being developed between CCCCC, UWI and NOAA. These arrangements include appropriate technical, financial and institutional provision. In addition, the CCCCC as the coordinating agency of the region on climate change aspects and official repository of climate change data, is committed to the proper maintenance and operation of the different stations as well as in the analysis of the data generated. The CCCCC is now recognized internationally as a center of excellence, and this reputation has helped it mobilize resources to help fund these activities. (See more details under 3.2 Outcome 6)

Development of Regional Strategy and Institutional Capacity

Adequate technical capacity for data and information generation (downscaling climate change models, impact modeling, vulnerability and risk assessment, operation and maintenance (O&M) of monitoring station among others) has been institutionalized at the national and regional level through the different national meteorology and hydrology agencies, universities and the CCCCC.

Further progress toward achieving the long term objective of mainstreaming adaptation to climate change considerations into the development process will also be pursued by the CCCCC in coordination with in-country stakeholders (champions). The CCCCC has recently finalized the Regional Strategy on climate change, which was adopted by the Heads of State in their July 2009 meeting, paving the road for a well articulated guide for resource allocation in which adaptation plays a key role. The combination of a well articulated strategy and adequate technical capacity at the regional level, together with the availability of increasing international adaptation-specific resources, provide the conditions for achieving this long-term target.

Business Plan of the CCCCC

The CCCCC has developed a business plan for the next five years, which articulates the role of the institution and their fundraising strategy to advance the adaptation agenda in the region. The CCCCC has been designated by CARICOM as the regional agency that coordinates the region's response to climate change. In this role, it will support the region through the provision of timely forecasts and analyses of potentially hazardous impacts of both natural and man-induced climatic changes on the environment, and the development of special programs to create opportunities for sustainable development. It will continue to be the official repository and clearing house for regional climate change data, providing climate change-related policy advice and guidance to the CARICOM Member States through the CARICOM Secretariat. In this role, the Centre is recognized by the UNFCCC, UNEP, and other international agencies as the focal point for climate change issues in the Caribbean. It has also been recognized by the United Nations Institute for Training and Research (UNITAR) as a Centre of Excellence. This reputation has helped the CCCCC mobilize resources to help fund its activities in the region. Current sources of funding include the Italian, Greek, and German governments, UNITAR, UNEP and USAID among others. More importantly CARICOM countries are directly funding various activities and operations of the CCCCC. For example, the CCCCC has established an endowment fund focused on the adaptation agenda with an initial contribution of US$ 1 million from Government of Trinidad and Tobago. The CCCCC plans to increase this fund through fundraising from other sources. Further testimony to the importance placed on the work of the CCCCC by CARICOM countries is the fact that the Government Barbados contributes US$30,000/year to the Center, Belize provides the infrastructure for the CCCCCC, and the Caribbean Development Bank (CDB) indirectly provides US $484,000 for the clearing house function of the CCCCC.

Follow-on projects

The CCCCC is currently implementing the GEF-funded SPACC project, which is focused on mainstreaming lessons learned from climate change adaptation pilot interventions, with the ultimate objective to increase the resilience of the natural resource base, focusing on biodiversity and land degradation along coastal and near-coastal areas of three OECS countries (St. Vincent and Grenadines, St. Lucia, and Dominica). This engagement sustains the benefits gained through MACC, and further advances the mainstreaming agenda in the region.

New multi-lateral and bilateral sources of funding for adaptation investments (e.g., Adaptation Fund of the UNFCCC, the GEF's Least Developed Countries Fund, the World Bank-administered Pilot Program for Climate Resilience, etc) provide a mechanism to scale up activities initiated under the MACC project, especially given the availability of already developed sectoral adaptation strategies, as well as the recently adopted regional strategy on climate change in the Caribbean region. In particular, the Bank-administered Pilot Program for Climate Resilience (PPCR) that became operational in 2009 is designed to pilot and demonstrate country-led integration of climate risk and resilience into core development planning, while complementing other ongoing activities. Indeed under the PPCR, the Caribbean region was selected (in August, 2009) as one of the priority regions where to finance a regional program. The selection of the Caribbean region was based on a PPCR Expert Group process that employed a risk assessment framework to guide country selection, using exposure to climate change hazards as an

entry point to identify regional climate change "hot-spots". Consequently, the PPCR program in the Caribbean Region, would proceed along two tracks which would include: (a) country-based investments in Haiti, Jamaica, Dominica, St. Lucia, St. Vincent and the Grenadines, and Grenada (the last 4 being OECS SIDS); and (b) region-wide activities focused on climate monitoring, institutional strengthening, capacity building and knowledge sharing. PPCR activities are being initiated immediately and will be able to scaleup what was achieved under the MACC project.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

(to current country and global priorities, and Bank assistance strategy)

The objective, design and implementation of the project are fully consistent with the region's development priorities, GEF priorities and Bank country assistance strategies. The project objective remained valid and more urgent throughout the project period. Indeed it is now well-established that the countries of the Caribbean are among the most vulnerable to global climate change (IPCC, 2007). While the severity of the impacts will vary from country to country, there is a suite of priority concerns directly linked to climate change that is virtually ubiquitous across the region. Sea level rise will combine a number of factors resulting in accelerated coastal erosion, increased flood risk and in some areas permanent loss of land. This may be exacerbated further by any increase in the destructiveness of tropical storms, the impacts of which will be greater due to sea-level rise even without increases in storm intensity. The impacts of sea-level rise are further exacerbated by the loss of protective coastal systems such as coral reefs. The Caribbean has experienced widespread coral loss in recent decades due to a variety of interacting factors including bleaching, which has become more frequent due to higher ocean surface temperatures, a trend which will continue into the future due to climate change (Gardner et al., 2005; Oxenford et al., 2007). Loss of coral is affecting livelihoods, for example of those dependent on tourism and fisheries. Sea-level rise is also associated with saline intrusion into coastal aquifers, affecting the availability of freshwater, which will combine with drought to increase water stress. The IPCC projections indicate a reduction in precipitation across most of the Caribbean throughout the year, with the largest reductions occurring in the boreal summer (Christensen et al., 2007). Hurricane intensity may increase as a result of anthropogenic climate change, although there is uncertainty about the future behavior of hurricanes and tropical storms in general (Vecchi et al., 2008).

Apart from climate-related risks, Caribbean states face similar sustainable development challenges, including limited natural and human resources, fragile ecosystems, proneness to natural hazards, high dependence on imports and a narrow range of economic activities, relatively high population densities and the effects of globalization. Most of the countries are also low-lying, with some coastal areas below mean sea-level (e.g. Guyana, parts of Belize and Bahamas). In all countries a high percentage of the population and much critical infrastructure are located along the coast.

The most recent Country Assistance Strategy for the OECS (2005) identifies the vulnerability of these economies to climate change impacts, and recognizes the need to

reduce their vulnerability to natural disasters. It goes further to acknowledge the need to support regional integration and coordination efforts. The CAS (2005) for Jamaica underscores the importance of reducing the country's vulnerability to natural disasters, which tend to place a bigger burden on an economy with a large debt problem. The latest CAS (2009) for Guyana aims at contributing to achieving improved Government's ability to reduce exposure to natural disasters and global climate risk as one of the two main outcomes. It identifies prevention of natural disasters such as the agriculture risk insurance management as a priority adaptation activity.

The design and implementation of a regional approach is perhaps the most appropriate way to proceed in the Caribbean region given the similarities in the climate risks faced by CARICOM countries. While there are some differences, these countries are all highly vulnerable and generally share similar vulnerabilities to risks associated with climate variability and change.

3.2 Achievement of Global Environmental Objectives

(including brief discussion of causal linkages between outputs and outcomes, with details on outputs in Annex 2)

The achievement of the GEO is rated **Satisfactory**.

The project achieved 95% of the outputs (See Annex 2) which contributed to strengthened regional knowledge base, enhanced capacity to assess vulnerability and risks, capacity to formulate adaptation policy options, sectoral specialists trained to incorporate climate change concerns into their work, and significant improvement in regional coordination on climate change issues. Also, the project successfully raised public awareness on climate change impacts. Thus, the project was successful in facilitating the creation of an enabling environment for climate change adaptation in CARICOM small islands and coastal developing states, and in advancing the region toward the incorporation of climate as a critical dimension in policy and decision making.

Outcome 1: Regional knowledge base on climate change has been strengthened. The achievement of this indicator is rated **Satisfactory**.

The Continuously Operating Reference Stations (CORS) were installed in Antigua, Dominica, and St. Vincent and the Grenadines in December 2006. The system was designed to provide the vertical reference data required to support the sea-level data. CORS equipment was financed by USAID and installed by the Department of Survey and Land Information (DSLI) of by the UWI St. Augustine. Installation for Belize was completed in July/August 2007. A two-day familiarization and training session was held in Belize for approximately twenty government and private sector surveyors who would be potential users of the CORS system and the data it would provide. The DSLI would support the future operation of the CORS in Antigua, Dominica and St. Vincent while the Ministry of Natural Resources and the Environment and the CCCCC will be responsible for the long-term operation of the CORS in Belize.

Seventeen sea level monitoring stations[6] were installed/refurbished and have become operational in the participating countries. The stations in Guyana, Grenada, and Antigua and Barbuda are maintained by Caribbean Institute of Hydrology and Meteorology (CIMH). Other countries maintain their own stations. While vast amounts of data are currently available, their reliability will only be ascertained after an appreciable period of operation.[7] Thus, reliability was not assessed at the time of the preparation of this ICR. Training on maintenance and operation of the stations was provided by CIMH to national operational staff in order to ensure performance and data reliability over time.[8]

The coral reef monitoring network and activities were expanded and strengthened. The capacity of the Centre for Marine Sciences (CMS) of the UWI was strengthened for coral reef monitoring, data collection, analysis, and archiving in the Eastern Caribbean and Trinidad and Tobago. The NOAA installed the Coral Reef Early Warning system (CREWS) at Discovery Bay in Jamaica with sensors and equipment to monitor oceanographic and meteorological parameters. However, the CREWS station is currently non-operational because of factors beyond the control of the project (hurricane). NOAA is checking the damage and has changed the design of CREWS to improve its resistance to similar disturbances in the future. The CMS has assigned a new technician and committed to bring it back to operational this year (2009). There have been discussions to develop a comprehensive MOU between NOAA and UWI for the maintenance and operation of CREWS.[9] Data are being stored by NOAA and the Regional Archiving Center (RAC) in Belize, supported by the contribution from the Government of Belize. The CMS will continue to provide technical support and the provision of training and capacity building to the Eastern Caribbean and Trinidad and Tobago in the coral reef monitoring beyond the end of the project.

The capacity to model climate change at a scale necessary for the region was developed and has been institutionalized at UWI at Mona and Cave Hill, Cuban Meteorological

[6] Eleven stations financed by MACC, 1 by Jamaica, and 5 by Trinidad & Tobago with their own funding respectively.

[7] At least 10 years to be able to allow an interpretation of the changes. The CCCCC will monitor the data reliability over time.

[8] Training was for 2 persons per country for Antigua, Barbados, Dominica, Greneda, Guyana, St. Kitts, St. Luica and St. Vincent. Other countries had built such capability under the CPACC project.

[9] The agreement with NOAA indicates that the CREWS established under the project currently belongs to the CARICOM Secretariat. The NOAA/CARICOM agreement expired during the course of this project and a comprehensive agreement between the UWI and the Centre is added to ensure the role of the CCCCC in continued operations of CREWS.

Institute (INSMET), and the CCCCC. A version of the PRECIS model was used to downscale climate change global models (MM5) to resolutions that can capture climate processes in most of the islands (25 and 50km), depending on data availability. Climate impact models were also reviewed, and key stakeholders were trained.

The quality controlled data from the clearing house are periodically disseminated through CIMH quarterly journals to all the Caribbean countries beyond CARICOM countries.

The capacity to translate climate change data into useful information for decision makers was also strengthened. A vulnerability assessment methodology was prepared under a participatory approach, and was applied to the 5 selected countries (Barbados, Belize, Jamaica, Guyana and Saint Vincent & the Grenadines). Country-level sectoral adaptation strategies were completed in 4 selected countries. The CCCCC continues to work with local champions to promote the adoption of these sectoral adapatation strategies by the respective governments. (See more under Outcome 4)

All the 5 vulnerability assessments, 4 sector strategies, models, the methodology of vulnerability assessment, and the accompanying recommendations are shared with all the 12 countries participating in the project. It can reasonably be assumed that these strategies are useful to the countries; for example Jamaica has already started to implement the sector adaptation strategy on water resources.

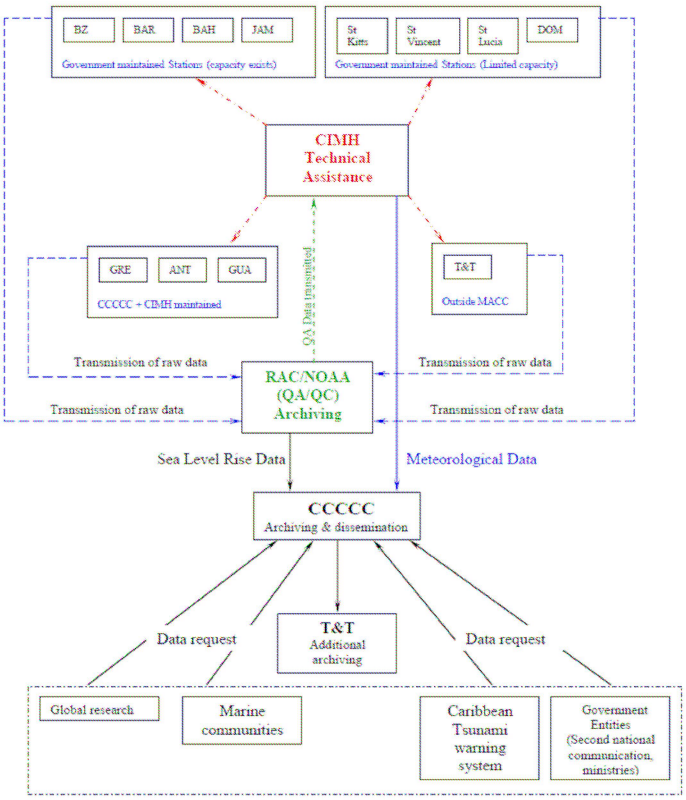

Figure 2: Schematic Outline of the Sea Level Monitoring Network

Outcome 2: A large constituency of sectoral specialists equipped and trained to incorporate climate change concerns into their work (vulnerability and risk

assessment, economic analysis, policy aspects, and adaptation strategies). The achievement of this indicator is rated **Satisfactory**.

Among several climate change models and impact models reviewed, PRECIS and MM5 were selected for scenario generation and short-term weather prediction. Two Caribbean experts (from Belize and Barbados) were trained in the use of these two models and in the analysis of outputs of the Japanese Earth Simulator for end-of-century scenario of climate impacts. Climate modeling research was performed in the graduate program at the Cave Hill and Mona campuses of the UWI. Climate modeling was also part of the curriculum in a Master of Science in climate **Natural Resource and Environmental Management Specializing in Climate Change** at Cave Hill. The program has contributed to the strengthening of the technical capacity within the Caribbean region to plan for and address climate change. Several graduates from the program are now employed and are making significant contributions from positions of influence in the various project countries. Below is a selected list of some of the recent graduates and their areas of work in the Caribbean.

Table 1. Selected Graduates of the University of the West Indies MSc Program in Natural Resource and Environmental Management Specializing in Climate Change

Year of Entrance	Name of Graduate	Country	Current Place of work/Activities
2002	Clarke, Judi	Barbados	Consultant for ECACC Project in the Caribbean UK Overseas Territories Project
2002	Dalrymple, Kofi	Guyana	Worked at UNDP Barbados and is/was pursuing a PhD. at a Florida University
2002	D'auvergne, Crispin	St. Lucia	National Focal Point and Head: Sustainable Development & Environment Section in the Ministry of Physical Development and the Environment, St. Lucia
2002	Gordon, Ann	Belize	National Focal Point and Deputy Chief Meteorologist, National Meteorological Service, Ministry of Natural Resources and the Environment in Belize
2002	Rankine, Dale	Jamaica	Former Acting National Focal Point and now GEF Small Grants Coordinator, UNDP, Jamaica
2003	Drakes, Gayle	Barbados	Interned at CCCCC and works for the Government of Barbados
2003	Hutchinson, Natalie	Barbados	Director, Ocean Research and Consulting Associates in Barbados
2003	Rahat, B. Saudia	Guyana	Program Officer, EDF Project, CDERA, Barbados
2004	Chandarpal, Gitanjali	Guyana	National Focal Point and Head of National Climate Unit in Guyana
2004	Joslyn, Ottis	St. Vincent	National Coordinator, Special Programme on Adaptation to Climate Change (SPACC) in St. Vincent
2004	Williams, Carren	Belize	Interned at the CCCCC. Currently works as a Physical Planner and Heads the Physical Planning Unit of the Ministry of Natural Resources and the Environment, Belize

CROPWAT and DSSAT models to assess vulnerability in the agriculture sector were reviewed and over 60 sectoral specialists were trained on the application and use of these models. Guidelines for conducting and mainstreaming vulnerability and capacity assessments in the Region were also developed.[10] A workshop on the use of these models

[10] Economic assessment and social aspects are included as part of the vulnerability assessment.

in developing vulnerability and capacity assessment (VCA) was held in Barbados in March 2005. A workshop to test the field use of the VCA methodology was held in Guyana in October 2005. Two workshops on agriculture modeling were held in Guyana in February 2007[11] and in April 2008.[12] The project held a workshop on the impact of climate change on water resources in the Caribbean targeting water managers and other professional in the water and wastewater sector in the region in Trinidad in Sep 2008.[13] In addition, 44 students were trained through a course developed with the funding of the project and taught by a NOAA trainer at the Master of Science level on the application of the vulnerability assessment methodology at UWI at Cave Hill.

However, the identification of no-regret adaptation measures was not carried out. No-regret measures were supposed to be developed based on the sector strategies and wide consultations were necessary. The delay in the development of the sector strategies resulted in limiting the scope of the activities to consultations with the National Focal Points. Using other sources of funding, the CCCCC is committed to finalizing the identification of no-regret adaptation measures.

Outcome 3: Awareness relating to climate change aspects and impacts enhanced for various stakeholder groups. The achievement of this indicator is rated **Satisfactory**.

The PEO strategy started by the ACCC project was finalized under MACC. National PEO strategies were prepared for seven countries were completed under the ACCC for seven countries namely, Antigua and Barbuda, the Bahamas, Barbados, Dominica, St. Lucia, Trinidad and Tobago, and Jamaica. The other countries were in various stages of completion at the inception of MACC Project except for St. Kitts Nevis which had not yet initiated the preparation of a PEO strategy. Under the MACC Project, Knowledge, Attitude and Practice (KAP) surveys were conducted to determine the baselines for subsequent monitoring and evaluation of the implementation of the national PEO strategies for Jamaica, St. Vincent and the Grenadines, Belize, Barbados, St. Lucia, Dominica and the Bahamas. MACC provided limited support through workshops, preparation of posters and other materials for distribution and celebration of international environmental days.

The CCCCC continues to support in implementing these national PEO strategies. Considerable resources were devoted to workshops and consultations early on in the project, which helped in increasing the knowledge of climate change among the various stakeholders, the role of the CCCCC, and the objectives and activities of MACC. Several materials were developed and disseminated (e.g., Mainstreaming newsletter, a handbook for journalists). However, not enough resources were left for the implementation of the

[11] A total of 17 participants:16 from Guyana and 1 from St. Vincent,

[12] A total of 37 participants: Antigua 2, Bahamas 2, Barbados 4, Belize 3, Dominica 2, Grenada 2, Guyana 6, Jamaica 2, St. Kitts 2, St. Lucia 2, St. Vincent 2, Trinidad 2, Cayman Islands 1, Anguilla 1, Suriname 2, Haiti 1, and Dominican Republic 2.

[13] A total of 28 participants. (Antigua 1, Barbados 2, Bahamas 2, Belize 2, Dominica 2, Grenada 1, Guyana 2, Jamaica 7, St. Kitts 1, St. Lucia 3, St., Vincent 3. Anguilla and Montserrat (one person respectively) also participated.)

PEO strategies. It was agreed at the MTR that the project concentrate on disseminating the main results of the project activities instead of implementing the developed strategy. The project then improved the web page on climate change issues created under CPACC[14] and the role of the CCCCC as the clearing house for climate change data in the region. Currently the clearinghouse function is being developed. Nevertheless, the Government of Germany is supporting the CCCCC with a specialist in the development of the clearinghouse, who will start work in the second semester of 2009.

Numerous training and workshops undertaken under component 1 helped increase awareness on climate change impacts. This included the participatory approach used for the preparation of the vulnerability assessment methodology, the training of Master of Science students in the methodology, and their involvement in the vulnerability studies.

Momentum has been created in terms of awareness at various levels (e.g., technical, policy, public, etc) and it needs to be maintained. Structures such as the Clearinghouse mechanism are critical in maintaining the flow of information within the the various key stakeholders (e.g., scientific community, policy makers, the public, etc) and should be utilized to the maximum to disseminate the considerable climate change scientific data generated by the MACC Project to the public at large in order to enhance consciousness and influence behavioural changes. Plans must now be put in place, in harmony with a PEO Strategy, for the implementation of Sector-based National Adaptation Strategies and other relevant recommendations from the MACC Project.

Outcome 4: National Sectoral Adaptation Strategies and Implementation Action Plans prepared in a participatory manner, and under consideration at appropriate governmental levels. The achievement of this indicator is rated **Moderately Satisfactory.**

The restructuring of the propect reduced the scope of this outcome to the development of four national (Jamaica, Barbados, Belize, and Guyana) sectoral adaptation strategies focused on three highly vulnerable sectors (agriculture, water and tourism). Based on previous project experiences, the selection of these four countries was based on information availability, institutional support, time frame and budget.

National sectoral adaptation strategies were developed for Jamaica (water), Barbados (tourism), Belize (water), and Guyana (agricultural). The strategies included an institutional and legal framework analysis, technical review of climate change impacts in the sector, assessment of current policy framework and an economic review of the sector, and presented a proposed plan of actions. The strategies provided key recommendations based on sound data collected under the project that would inform decision makers on how to mainstream climate change concerns into sectoral policies. The strategies are in the process of being presented to the Cabinet in the respective countries, and in the particular case of Jamaica and Guyana, the governments have already begun implementing some of the recommendations from their respective sector adaptation strategies. For example, Jamaica has created a dedicated climate change unit to coordinate activites while Guyana is developing a program that is promoting adaptation to coastal crop agriculture via combating flooding and increased salinity in coastal areas.

[14] Which is currently the web page of the CCCCC.

Under the role assigned by CARICOM to the CCCCC to provide climate change related policy advice and guidance to CARICOM member states, the CCCCC plans to play a major role in the development of similar strategies among other CARICOM member states. (See more under Outcome 6)

Outcome 5: Plans prepared for more effective enforcement of existing policies and regulations, especially where these have implications for addressing climate change concerns. The achievement of this indicator is rated **Moderately Satisfactory**.

The analysis undertaken to prepare the sectoral adaptation strategies included an assessment of the current policy framework and future requirements to fully comply with the sectoral adaptation strategy, including the need for more effective enforcement. The strategies were finalized very late in the project cycle partly due to the need to sequence the development of the VCAs and the strategies. The strategies are currently in the process of being presented to and adopted by the respective governments. Once this happens, plans for effective enforcement, as well for the implementation of the strategies can be developed. The governments participated in the formulation of the strategies not only at technical levels, but also at senior decision-making levels (e.g., the Minister for Agriculture of Guyana). Therefore, given this high-level government involvement and buy-in, it is likely that all the strategies will be adopted by the countries. The CCCCC is committed and will continue to play a key role to facilitate the adoption of the sectoral adaptation strategies by the respective governments and in scaling up this effort to other countries.

Outcome 6: Regional coordination improved on climate change issues, and a regional strategy prepared. The achievement of this indicator is rated **Highly Satisfactory**.

Regional coordination has improved significantly. CARICOM designated the CCCCC as the agency that coordinates the region's response to climate change. In this role, it is supporting the region through the provision of timely forecasts and analyses of potentially hazardous impacts of both natural and man-induced climatic changes on the environment, and the development of special programs to create opportunities for sustainable development.

The CCCCC is recognized by the UNFCCC, UNEP, and other international agencies as the focal point for climate change in the Caribbean for its role as the official repository and clearing house for regional climate change data and to provide climate change-related policy advice and guidelines to the CARICOM Member States through the CARICOM Secretariat.

A regional position is prepared and agreed prior to each Conference of the Parties (COP), subsidiary bodies, and UNFCCC discussions. These are incorporated into the AOSIS negotiating position since the Caribbean region negotiates as part of the AOSIS group. Also at the request of CARICOM, the CCCCC is developing at the request of CARICOM the regional negotiating position for the UNFCCC COP to be held in Copenhagen, Denmark at the end of 2009.

The Regional Strategy on climate change was prepared in a participatory fashion and adopted by the Heads of State in July 2009. The strategy defines the main pillars on

which the region is focused, including mainstreaming climate change adaptation and encouraging actions to reduce vulnerability, among others. The Regional Strategy addresses the issue of resource mobilization to implement the strategy itself. The specific definition of its implementation will be part of the work assigned to the CCCCC by CARICOM's Heads of State.

The CCCCC has also been recognized by the United Nations Institute for Training and Research (UNITAR) as a Centre of Excellence. This reputation has helped the CCCCC mobilize resources to help fund climate change activities in the region. Sources of funding include the Governments of Italy, Greece and Germany, UNITAR, UNEP, USAID among others. What is significant is that CARICOM countries and institutions (e.g., Trinidad and Tobago, Belize, Barbados, Caribbean Development Bank) are contributing appreciable amounts of resources towards the functions and activities of the CCCCC.

3.3 Efficiency

(Net Present Value/Economic Rate of Return, cost effectiveness, e.g., unit rate norms, least cost, and comparisons; and Financial Rate of Return)

The Caribbean Small Island Developing States (SIDS) have been identified as among the most vulnerable to the anticipated impacts of climate change. The expected sea level rise, increase in sea surface temperature, and altered patterns of precipitation are likely to hit these countries the hardest. The benefits associated with increasing resilience to climate change are enormous.

In recent analysis, the World Bank estimated that the aggregate losses incurred by the Carribean SIDS as a result of storms over the period 1979-2005 are US$613 million annually. While estimating the future climate scenario and the potential economic impacts on the Caribbean is difficult, a recent estimate[15] of the economic consequence of the potential impacts of climate change on CARICOM countries concluded that the damage could be in the order of US$11.2 billion annually ca. 2080, that is equivalent to 11.3% of all CARICOM countries total annual GDP (in 2007 US$ prices) (Toba, 2009). The same estimate for for the 12 countries which participated in MACC is US$9.8 billion per year conservatively. (See Annex 3)

With the total project cost including co-financing of $10.55 million, the MACC project has contributed to the countries efforts to prepare proactive measures to strategically adapt to the impacts of climate change. The incremental cost analysis done at the time of design (with or without GEF funded interventions), indicated that the amount needed to move the agenda in the region toward mainstreaming climate change considerations into development planning was negligible given the significant risks the countries face individually and collectively. The conclusion at this time is not different. Moreover,

[15] Toba, Natsuko. "Potential Economic Impacts of Climate Change in the Caribbean Community", Assessing the Potential Consequences of Climate Destabilization in Latin America, Sustainable Development Working Paper 32, June 2009.

models to predict impacts of climate change have improved and more data is available, reducing the uncertainty around the estimation of impacts.

3.4 Justification of Overall Outcome Rating
(combining relevance, achievement of GEOs, and efficiency)

Rating: **Moderately Satisfactory**

Although the project achieved significant outcomes, the first half of the project faced significant shortcomings both in terms of design and implementation which led to the project restructuring with the result of some activities covering fewer countries than originally defined at design stage. Following the restructuring, project implementation improved significantly and achievements of the GEO are highly relevant for the development of the region in terms of creating an enabling environment for climate change adaptation regardless of the change in scope in some of the indicators.

Climate change continues to be, even more so, a major threat to the sustainable development of the Caribbean region, and countries need to enhance their capacity (scientific knowledge base, institutional capacity, development of sound policies, and regional coordination) in order to reduce their vulnerability to the impacts of climate change.

The positive assessment of having created an enabling environment is based on: (a) the ability developed in the region to assess the adaptation problematic (e.g., ability to downscale climate change data and to undertake vulnerability assessments); (b) the ability to develop actions plans (example are the action plans developed as part of the sectoral adaptation strategies); (c) the consolidation of the Caribbean Community Climate Change Center (CCCCC); and (d) the development of a regional vision reflected in the Regional Strategy endorsed by the Heads of Government in July 2009.

Achievement of GEO based on the assessment of the original outcomes/outputs indicators is considered moderately satisfactory. As a result of the project, the region has advanced in creating the environment and the process, yet not over, to incorporate climate change concerns as a key dimension in development policy and decision making.

3.5 Overarching Themes, Other Outcomes and Impacts
(if any, where not previously covered or to amplify discussion above)

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

Not applicable as this is an enabling environment project.

(b) Institutional Change/Strengthening
(particularly with reference to impacts on longer-term capacity and institutional development)

One of the most tangible and far reaching results from the project is the growth of the CCCCC into a center of excellence on climate change issues in the region. The major impact of restructuring the MACC Project came from the role assigned to the CCCCC as executing agency of the project, the decision to emphasize activities in the field and engagement of local partners (champions). As a newly-established institution, the CCCCC benefitted from the MACC project in the following ways: 1) by dealing with all the 12 participating countries at the same time, the Center quickly gained experience and consolidated its role as a credible regional institution capable of executing regional/ large

international projects, 2) the Center now has a very advanced technical computing and modeling capacity on climate changes issues that was directly financed by the project, and 3) internal fiduciary systems (accounting, financial management, and procurement) capacity was enhanced through training provided to the Center by Bank staff via project activities. In fact the project financed the hiring of 4 Center staff (accounting, financial management, procurement, administrative) that have now been fully absorbed as core staff of the Center following project closure.

The Center is now recognized internationally as the lead institution of the Caribbean Community on matters related to climate change. The Center was formulated, as the technical institution of the region for climate issues, with Bank assistance in 2002. It was formally created in 2005 and undertook responsibility for the MACC project at the end of 2006.

The project also had a great achievement in strengthening the regional capacity on collecting sound data and developing policy options based on those data. Long-term capacity is ensured through multiple agreements among partner institutions to maintain the knowledge base. It is also achieved through the sheer number of people trained through various workshops, the majority of whom use the knowledge in their various capacities.

(c) Other Unintended Outcomes and Impacts (*positive or negative, if any***)**

The Coral Reef Early Warning system (CREWS) at Discovery Bay in Jamaica was damaged by a hurricane. However, restoration measures are being undertaken by NOAA. The CMS is committed to bring it back into operational this year. (See 3.2 Outcome 1).

A pilot to strengthen the resilience of Caribbean coral reefs to climate change impacts was successfully initiated in Belize. The work investigated *Acropora* corals to identify and propagate temperature tolerant genotypes, so that second generation fragments will be available in future phases for out-planting to reef adaptation sites where severe bleaching, temperature related coral disease and/or hurricanes have been observed. Eleven nurseries were established and distributed throughout the northern, central and southern reef locations. Protocols have been established and local personnel trained in monitoring and management techniques to maintain the sites. The local coral reef researchers and other interested parties including fishermen and tour guides have been trained and included in the collaborative approach effort and they have volunteered to help keep the monitoring going. Further information is available in the project files.

The tools (models, vulnerability assessments, etc) developed under MACC were used in the British Overseas Territories of Anguilla, Cayman Islands, Montserrat, and Turks and Caicos Islands, using resources provided by the British Government (DFID).

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

During the period March 23-24, 2009, a project closing symposium was was held in Saint Lucia to present and discuss the project outputs and results. The symposium was attended

by representatives of most of the countries that participated in the MACC project as well as from other Caribbean nations not involved in the project (Surinam and French Territories). It was chaired by the Prime Minister of Saint Lucia. More than seventy (70) participants attended the two day event. Development partners such as the USAID, UNDP, the World Bank and DFID also attended the meeting. The conference was divided into two sections each occupying one day. On the first day presentations were made on the outcomes of the activities conducted under the MACC project by the cooperating partners and other consultants. The Project Manager presented the final summary report of the MACC by technical components and an independent consultant presented the end of project external review report. On the second day the formal opening of the conference took place with the Honorable Prime Minister of St. Lucia delivering the keynote address and officially opening the conference. Other presentations during the opening session were delivered by the Minister of Agriculture for Guyana, the Secretary General of the CARICOM Secretariat, etc. Papers were presented under three technical sessions, "Climate Change: Glimpses of the Future in the Caribbean"; "Regional Institutions: Sector Approaches to Climate Change"; and "Development Partners: Support to Regional Climate Change Initiatives".

There was consensus emerging from the meeting that the project was successful in attaining its objective of "facilitating the creation of an enabling environment for climate change adaptation in CARICOM small island and coastal developing states" and in advancing the region's efforts toward the incorporation of climate as a key dimension in policy and decision making. An independent assessment of the End of Project has also been completed and coincides with this finding. A measure of the current situation is the decision of CARICOM to entrust its task force on climate change and development to the CCCCC, as agreed at the 20th Inter-sessional Meeting of Heads of State in July in Belize. Also, the CCCCC is developing, at the request of CARICOM, the regional negotiating position for the COP at Copenhagen. Beyond the central role it now plays in setting policy and positions, the CCCCC has been able to attract support from the international community. (See more in Annex 6)

The lessons learned in MACC are being applied in other operations in the region and there is already a strong South-South exchange of lessons and practices among practitioners, in which the CCCCC plays a central role.

4. Assessment of Risk to Development Outcome

Rating: **Moderate**

Increased awareness on the impacts of climate change in small island sates and the consequent imperative need for adaptation has elevated the discussion on climate change in the regional agenda. Further, the consolidation of the CCCCC, officially opened in August 2005, provides the regional institutional mechanism to sustain the climate change agenda in the region in the long-term. The CCCCC had gained regional and international recognition as the voice of the CARICOM member states on climate change issues, validated by its increasing ability to attract donor contributions to promote adaptation and

mitigation in the region. For example, the Government of Italy has pledged its support, as well as other EU nations.

During the course of the project, efforts were made to increase the sustainability of the enhanced knowledge base, adequacy of the monitoring equipment and systems, and the technical capacity to operate and maintain monitoring equipment, analyze data and utilize climate models. These included the focus of the project on building new and strengthening regional/local capacity, with the support of international expertise (e.g., NOAA and Hadley Center), and the formalization of several O&M agreements (e.g., CIMH, CMS, NOAA), aimed at providing the necessary support to continue with the generation and analysis of monitoring data. Further, the inclusion of climate change in the curriculum at the M. Sc. level at the UWI at Cavehill is expected to enhance the sustainability of these capacities.

Following the completion of sectoral adaptation strategies, adoption and implementation of the strategies is in progress in the respective countries (Belize, Guyana, Jamaica and Barbados).

The adoption of the Regional Strategy by the Heads of Government, as a sign of country ownership, awareness and recognition of the relevance of the subject, combined with an institutionalized strengthened technical capacity, and the availability of increasing international resources to finance the implementation of the adaptation agenda in the Caribbean (e.g., donors' contribution to the CCCCC and other sources including the PPCR), are promising signs that the agenda will keep progressing. However, various factors such as the general weak/inadequate capacity existent in the region, the limited availability of local resources made worse by the current financial crisis, the imperative need of tackling the day to day challenges of small island economies, present challenges to the adaptation agenda that cannot be ignored.

5. Assessment of Bank and Borrower Performance

(relating to design, implementation and outcome issues)

5.1 Bank

(a) Bank Performance in Ensuring Quality at Entry

(i.e., performance through lending phase)

Rating: **Moderately Unsatisfactory**.

The design of the project was particularly ambitious in terms of scope of activities and institutional arrangement, without taking into account the absorptive capacity of the different governments. It is evident that the project design was cumbersome and complex given the large number of activities (5 components and 17 sub-components) to be undertaken, the many partner institutions involved, and the level of involvement and active participation required from many stakeholders. The design was also overly ambitious and optimistic in terms of the time and capacity required for efficient project execution and delivery. The project design would have benefitted from **simplification** (e.g., by condensing the number of subcomponents/activities in order to concentrate resources and efforts) and proper in-project **sequencing** of activities (e.g., the bulk of the PEO component should have been implemented in the second half of the project cycle;

this would have ensured that PEO was driven by the content/data/knowledge generated from implementation of components 1, 2, and 3. Instead PEO was undertaken from the start of the project with minimal content and by the project MTR, the budget for PEO was almost fully expended). MACC was a regional project targeting 12 countries that had uneven levels of readiness, different perspectives, and varying levels of country ownership (however, this has tremendously changed at the end of project). In such circumstances, implementation tends to take a long time and requires proactive involvement and engagement of many stakeholders (regional institutions, local governments, etc), as well as an empowered PIU at the regional level with strong management skills. Although the institutional arrangements defined at the time of project preparation appeared adequate, they were later proven inadequate and complex for effective project execution. In addition, the complexity of the project stemmed in part from the many collaborating partners namely: CARICOM Secretariat, PIU, five coordinating beneficiary agencies (Caribbean Institute for Meteorology and Hydrology (CIMH), Climate Studies Group at UWI Mona, Faculty of Engineering at UWI St. Augustine, the Caribbean Disaster Emergency Management Agency (CDERA), and the Center for Marine Studies (CMS) at UWI Mona), and National Implementation Coordination Units in each country. There are inherent high transaction costs (time, money) associated multi-partner arrangements as was the case in MACC especially if most of the partners end up relying wholly/partially on project resources to execute activities. Also in some instances, the terms of collaboration agreement between the CARICOM Secretariat and a partner institution was not specific[16], which later created a need for the CCCCC to assume a function which was supposed to be provided by the partner institution.

In addition, there was no capacity analysis done that justified the selection of the CARICOM Secretariat as the implementing agency. This ommission later proved to be one of the key weaknesses of the project.

Risks associated to the preparedness of CARICOM Secretariat to undertake the project and the limited absortive capacity of the different countries and agencies involved were not identified by the project. Fiduaciary risks related to the capacity of CARICOM Secretariat and the PIU to implement Bank's financial management and procurement standards were correctly identified, however mitigation measures put in place proved inadequate as evidenced by the slow implementation of activities. Other risks were in general properly identified including a moderate risk of the monitoring network not being efficiently maintained, and the potential of the project being unable to contribute to expanding the information base,

(b) Quality of Supervision
(including of fiduciary and safeguards policies)

[16] For example, the RAC was originally located in the UWI which suggested CIMH would maintain it. CIMH later requested the project to finance the staff and other operating expenses.. Because no value added came from such an agreement, the CCCCC decided to house the RAC itself.

Rating: **Moderately Satisfactory**.

The information provided by the Bank task team through the status reports was generally informative and constructive. The Bank team conducted field missions once a year on average, supplemented by frequent audio conferences. A total of 15 ISRs have been filed, reporting in detail the progress of the project implementation. However, it is clear that the Bank's supervision of the project during its first three years was very inadequate. For example, during the period 2004-2006, there was a gap of eight months between the fourth and fifth ISRs and a one year gap between the fifth and sixth ISR. Furthermore, based on the archived ISRs, the Bank task team did not recognize until the third year, the two critical problems that affected the project implementation: the issue of CARICOM Secretariat's internal processes and complex communication procedures that had resulted in systemic delays and consequently, slow disbursement; and the delay in filling the Project's Technical Coordinator position (the original Coordinator had resigned). In addition, in the first half of the project, there was a disbursement ceiling of US $100,000.00 (one hundred thousands dollars only) which hampered the ability of the Recipient to implement the agreed project work program. Also, the fact that the MTR was delayed for a year also contributed to the delay in addressing the critical issues.

(c) Justification of Rating for Overall Bank Performance

Rating: **Moderately Satisfactory**.

The Bank's initial appraisal, the project's readiness, and supervision during the first three years of the project were weak and inadequate. This demonstrated lack of proactivity and realism on the part of the Bank up to 2006 contributed greatly to limiting the timely and effective implementation of the project. After the issue became too obvious and the MTR was conducted, the Bank effectively assisted the client in restructuring the project in order to achieve the project objectives within the limited timeframe that remained for the project. An extensive review by Legal, FM, Procurement, and Disbursement, and the Region's management contributed to constructing an improved implementation arrangement of the second half of this project. Hence, considering the positive turn-around from 2007 onwards following the Bank-assisted restructuring, and the supervision and achievements of the project after the restructuring, overall Bank performance can justifiably be given a borderline rating of Moderately Satisfactory.

5.2 Borrower

(a) Government Performance

Rating: **Satisfactory**.

CARICOM countries' participation at higher level has contributed to the adoption process of adaptation policy options, sectoral adaptation strategies and vulnerability and risk assessment studies.

The governments have shown their commitment to addressing climate change adapatation. For example, Heads of Government of the Region have categorized climate change as second in importance only to the recent global financial crisis and will continue to address this issue at their meetings. The CARICOM Secretariat is fully supportive of and complements the mission and role of the CCCCC as the regional lead institution on climate change issues. This complementarity led the Government of Trindad and Tobago to contribute US$1.0 million for the creation of a trust fund to enhance the sustainability of the activities undertaken by the CCCCC. This was a major recognition and contribution by CARICOM of the strategic value of the CCCCC.

(b) Implementing Agency or Agencies Performance
Rating: **Moderately Satisfactory**

Although the project experienced major delays in the first half of the implementation period, the project was managed effectively towards the end of project. Therefore, the overall implementing agency performance is rated satisfactory but with the caveat that performance in the first 3 years of project execution was uneven and sub-optimal.

CARICOM Secretariat

While the CARICOM Secretariat provided substantial support for the preparation of the project, their role as the implementing agency was not fulfilled satisfactorily. As noted earlier in this report, the poor execution was mainly due to the internal processes and complex communication procedures at CARICOM Secretariat that resulted in systemic delays in responses and actions. This was compounded by the fact that CARICOM Secretariat had no technical staff conversant on climate issues. Also they were not able to develop fiduciary capacity (accounting, financial management & procurement) mainly because the deposit to the Special Account was extremely low and was not enough to hire full-time staff.[17] As a result, and following the recommendations of the MTR, the CCCCC effectively took over the implementing agency role in March 2007.

The CCCCC

The implementation of the MACC project improved significantly after the CCCCC took over the project as the implementation agency. But it should be pointed out that it took slightly over 6 months to actually transfer the project from CARICOM Secretariat to CCCCC. During the project transfer period (08/2006 – 04/2007) there was no disbursements made since CCCCC did not yet have a project account on one hand, and on the other hand CARICOM Secretariat had already closed the project account. This meant that project staff were not paid during the transition period and the Center had to rely on their other resources to keep project activities moving. If one considers the fact that Center effectively took over the Project in May, 2007, then the actual implementation period available for the CCCCC to execute the MACC Project was about

[17] The bureaucratic process of the Secretariat hindered a timely adjustment on this matter.

23 months (May 2007 – Mar 2009). This would not have mattered much if project execution in the first 2-3 years had been on track. However, it is clear that the Center inherited a project that was significantly behind schedule in terms of execution.

The CCCCC deployed a dedicated team, comprising a full time project manager and a technical specialist, filling a much required gap identified under the previous management structure. With the very close supervision of the World Bank task team, was able to effectively execute the project based on the comprehensive work plan which was prepared showing the critical path for the implementation of each activity for the remaining time of the project. The CCCCC accelerated disbursements and the pace of implementation of the activities including (1) restructuring of Component 2 to maximize synergies with the companion SPACC project, (2) the deployment and operation of the CREWS station, and (3) resuming other pending activities.

On Component 2, a strong coordination between the MACC project and the companion SPACC project took place under the leadership of the CCCCC. For example, work on the sector activities was reprogrammed and refocused to ensure that enough information would be made available for the adaptation measure to be supported under SPACC, ensuring complementarity between both projects and efficient use of resources.

The CCCCC has become fully operational and is now recognized as a regional center of excellence on climate change issues. It is well staffed, as initially designed, with a flexible organization that allows for growth, on a project-by-project basis. The CCCCC has been very successful in attracting donors and partners to work on climate related issues in the region. A recent measure of this success is the decision by CARICOM to entrust its task force on climate change and development to the Center, as agreed at the 20th Inter-sessional Meeting of Heads of State in February 2009.

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

Since government performance is rated satisfactory and the implementing agencies' performance is rated moderately satisfactory, the overall recipient performance is rated moderately satisfactory.

6. Lessons Learned
(both project-specific and of wide general application)

- The readiness and ability of countries to increase their resilience to climate change impacts greatly depends on the institutional capacity, knowledge of vulnerabilities and risks and their preparedness to reduce these vulnerabilities and risks. This task is more daunting for small economies with limited amount of resources, as CARICOM small islands and low-lying coastal states; hence the

need for an effective regional coordination that reflects a harmonized vision and position.

- A regional program is likely to provide significant benefits over a single-country/country-by-country approach in cases where a single country lacks adequate level of resources, knowledge, and capacity and/or where opportunities for key adaptive measures may only be realized through regional or sub-regional cooperation on the management of transboundary climate hazards. Small Island Developing States (SIDS), such as those in the caribbean, have urgent needs to address their special vulnerability to sea level rise and to the impacts of increased intensity of extreme climatic events, including impacts on water resources, natural resources and ecosystems, cities and ports. Yet, these SIDS face various barriers in addressing development and climate change related issues largely due to limited institutional and technical capacity, small size, and often isolated/remote location. Thus a regional adaptation program would provide an opportunity to overcome some of these barriers while also promoting the transfer of lessons, replication and scale-up of adaptation measures. However, **it is crucial that countries in a regional program have common climate risk and vulnerability profiles**.

- Wholesale implementation of regional climate change adaptation programs is a real challenge due to varying country ownership and contexts, capacities, institutional set-up, priorities, and political realities. Therefore, it is crucial to manage the tension between regional adaptation activities and national ones. Alternatively, the task team should undertake a rapid consultative exercise of delineating the types of activities that are best done regionally and those that are more suitable to be addressed on a national basis. **Regional adaptation programs can be implemented most effectively if they are driven by and anchored in specific national adaptation activities.** This will reduce the inherent inertia between regional goals and national interests. While generic activities such as awareness raising, modeling and sharing lessons learnt can be done across borders, specific and concrete sectoral/multi-sectoral adaptation activities must be executed at country level in order to ensure alignment with respective country capacities, institutions, policies and political processes. While it would at face value appear counter-productive, regional adaptation programs should consider having/identifying/supporting 'champion country(ies)' or 'champion national activities' that can serve as examples for the other countries while also enhancing the quality and speed of implementation of regional adaptation measures. Indeed, **local ownership and champions** (be they individuals, institutions, etc) are crucial for the successful implementation of regional adaptation measures.
- **To enhance sustainability, regional climate change adaptation programs should build on existing collaboration on climate sensitive development issues and/or on prior involvement in regional programs**. Such regional programs should consider financing and implementing activities such as: identification of

measures to reduce climate vulnerabilities and risks; exchange of lessons learned; regional technical assistance; development of tools and methodologies to assess vulnerability to and impacts of climate; provision of capacity building through targeted training; institutional strengthening; awareness raising on regional climate threats and likely impacts; regional climate monitoring and early warning systems; inclusion of climate change in regional planning strategies, policies and development programs; etc.

- Communication, both in terms of project design and project implementation, is key to success. In all the stages of a project, there must be more input from and participation/ involvement of the stakeholders. The flow of information must be maintained at all times in order to foster true partnership and create strong country ownership. Although the CCCCC satisfactorily executed the MACC Project, there is further challenge for the CCCCC to improve communications on its role as an implementing agency, a facilitating entity, a climate change negotiating institution, a technical and scientific resource organization to the member countries or any combination thereof. To this end, the CCCCC may need to develop a communication strategy or mechanism.

- The in-house accounting, financial and procurement capacity of the implementing agency is central to the smooth execution of project activities. Financial and procurement capacity assessments identified various aspects of implementation weakness. Although risk mitigation measures were designed and implemented, the project could not avoid serious disbursement delays. The capacity assessment may need to be expanded beyond financial and procurement capacity to look further at other aspects of the administrative arrangements such as division of responsibility between the PIU and the recipient organization (CARICOM Secretariat in this case), physical location of the PIU, communication protocols and internal procedures for administrative processes, etc. This is critical especially if the recipient has never implemented Bank-supported projects.

- Fiduciary Compliance: Implementation support, targeted training of PIU staff, and sustained supervision can greatly enhance fiduciary (financial, procurement) compliance. Given resource constraints which limited the extent of financial management supervision, the innovation of **reverse supervision**, whereby the PIU team visited Washington to review the status of project implementation greatly enhanced financial and procurement management in the project. This technique was used several times and pending (financial and procurement) issues were satisfactorily addressed. Future projects should focus on implementation support including availing PIU fiduciary staff with the training opportunities offered at the Bank for Caribbean PIUs. Also future operations, especially climate change adaptation programs, must have sufficient supervision budgets, to enable sustained fiduciary supervision in response to implementation issues as they arise.

- For projects in low/weak capacity environments, Bank efforts should emphasize implementation support rather than implementation supervision. Although it is not uncommon that a project experiences implementation problems in the initial stages of the project, close attention should be paid in the first years and the issues should be managed in a timely manner without waiting until the MTR is carried out.

- The institutional arrangements need to be simplified for effective project implementation. Separate and several layers of bureaucracy in project implementation should be avoided so as to reduce delays in execution. Such multiple layers appear too bureaucratic and daunting to some stakeholders. It is also not conducive to reducing time lags between decisions and actions.

- Proper in-project **sequencing** of activities is crucial for effective implementation and achievement of project objectives. Ideally the bulk of the PEO component should have been implemented in the second half of the project cycle; this would have ensured that, as intended, PEO was driven by the content/data/knowledge generated from implementation of components 1, 2, and 3.

- Clear project objectives should be matched by simple project design. While MACC had very clear objectives, its execution was hampered in part by a cumbersome project design. Project design should be carefully assessed so as not to be overly-ambitious for the existing capacity of the recipient and the government counterparts. Projects should avoid complicating execution by having too many activities, especially for regional projects which inherently tend to be complex in nature.

- Project executing and collaborating agreements (MOUs, etc) with key partner institutions should not be open-ended, rather they should be targeted and ring-fenced. Collaboration arrangements should be as clearer as possibile in terms of specifying the terms of cooperation, defining the costs and outputs expected from each pertner. Otherwise, other options should be considered, for example, by competitively procuring consultancy services in order to increase efficiencies in terms of time, costs, and control of outputs.

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

(a) Borrower/implementing agencies

(b) Cofinanciers

NOAA

ACCC financed by CIDA was a parallel project that bridged CPACC and MACC. Therefore, it is not considered direct co-financing for MACC.

DFID provided funding for using the tools developed under MACC in the British Overseas Territories of Anguilla, Cayman Islands, Montserrat, and Turks and Caicos Islands.

(c) Other partners and stakeholders
(e.g. NGOs/private sector/civil society)

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (CARICOM inUSD millions)*	Actual/Latest Estimate (CCCCC in USD millions)**	Percentage of Appraisal
BUILD CAPACITY TO ASSESS VULNERABILITY AND RISKS ASSOCIATED WITH CLIMATE CHANGE	**2.32**		**0.86**	
BUILD CAPACITY TO REDUCE VULNERABILITY TO CLIMATE CHANGE	**0.73**		**0.27**	
BUILD CAPACITY TO ACCESS AND EFFECTIVELY UTILIZE RESOURCES TO REDUCE VULNERABILITY TO CLIMATE CHANGE	**0.18**		**0.12**	
PUBLIC EDUCATION AND OUTREACH	**0.59**		**0.09**	
PROJECT MANAGEMENT	**1.18**		**1.05**	
TOTAL	**5.00**	**2.59**	**2.39**	
Total Baseline Cost				
Physical Contingencies	0.00			
Price Contingencies	0.00			
Total Project Costs				
Project Preparation Facility (PPF)	0.00			
Front-end fee IBRD	0.00			
Total Financing Required				

*Financial data for the first phase of the project (CARICOM Secretariat as implementing agency) is only available by category and not by component, and therefore, only the total value is presented.
**The latest available financial data from the CCCCC correspond to the end of project forecast by January 2009, and therefore the total amount differs by USD-121,459.97 from actual disbursements by the Bank by the end of the grace period (July 2009).

CATEGORY	Original Amount of the GEF Allocation (in US$)	Revised Amount of the GEF Trust Fund Grant Allocated (in US$)	Actual Disbursements (in US$)
1: Goods	480,000	540,390	460,062.37
2: Consultants Services	2,930,000	2,066,570	2,148,491.43
3: Training	1,100,000	1,324,411	1,310,871.49
4: Transitional PIU Costs		245,922	245,921.97

	230,000		
5: Operating Costs	180,000	822,707	697,604.77
6: Unallocated	80,000	0	0.00
Total	5,000,000	5,000,000	4,862,952.03

(b) Financing and Co-financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Borrower		3.15	3.10[1]	.98
Government of CANADA (CIDA)		2.00	2.40[2]	.86
US Govt. (NOAA)		0.80		
DFID[3]		0.00		
Global Environment Facility (GEF)		5.00	4.86	.97
USAID			193K	
TOTAL		10.95	10.55	

1: Estimated in-kind and cash contributions by CARICOM Governments, CCS and partner organizations, including support to CCCCC.
2: Estimated in cash and in-kind contributions of CIDA on ACCCC and NOAA on equipment for CORS. Strticktly speaking, CIDA funding should not have been considered direct co-financing given that it financed the ACCC project which was a parallel project that bridged CPACC and MACC.
3. DFID provided addition financing for using the tools developed uinder MACC in the British Overseas Territories of Anguilla, Cayman Islands, Montserrat, and Turks and Caicos Islands for an amount of approximately USD600,000.

Annex 2. Outcomes and Outputs by Component

(a) GEO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Outcome Indicator 1 :	**Strengthened regional knowledge base: 90% of the stations reporting with 90% reliability; wide dissemination of climate change related data and documentation; models, databases, vulnerability assessments and adaptation approach developed under the project are found useful by potential users/beneficiaries who are also willing to use them, and are assessed of satisfactory quality.**			
Value (quantitative or Qualitative)	Limited knowledge on downscaled climate projections, some knowledge on coastal VA and adaptation options, some work on economic instruments for no-regrets actions			CORS and 17 Sea Level Monitoring stations are operational Data stored by NOAA and RAC. Downscaling of climate data available at a scale useful to the region. Vulnerability Assessment methodology finalized and used as the basis of the adaptation strategies developed under the project.
Date achieved	06/01/2003	06/30/2008		03/31/2009
Comments (incl. % achievement)	Satisfactory. CCCCC with participating governments will continue O&M of the network during life-span of instruments. CREWS is being repaired with NOAA's and UWI's support. While vast amounts of data are currently available, their reliability will only be ascertained after an appreciable period of operation. The strategies are currently in the process of being presented to and adopted by the respective governments. The project closing symposium attended by the beneficiary countries concluded that the project has contributed to advancing the region towards the incorporation of climate issues in policy and decision making. An independent assessment of the End of Project also arrived at the same conclusion.			
Outcome Indicator 2 :	**A large constituency of sectoral specialists equipped and trained to incorporate climate change concerns into their work (vulnerability and risk assessment, economic analysis, policy aspects, and adaptation strategies)**			
Value (quantitative or Qualitative)	No constituency of sectoral specialists trained to incorporate climate change concerns into their work			Over 60 sectoral specialists were trained on the application and use of CROPWAT and DSSAT models. A total of 57 sectoral specialists and over 40 M.Sc. students on vulnerability assessment methodology. Workshops were held to apply the models in the VCA development and to test the field use of the methodology.
Date achieved	06/01/2003			03/31/2009
Comments (incl. % achievement)	Satisfactory. Some of the graduating Masters students are now government staff in the related areas.			
Outcome	**Public awareness of climate change issues and impacts enhanced**			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 3:				
Value (quantitative or Qualitative)	Limited information about climate change issues. Information mostly event related; not much technical information nor adaptation actions (based on CIDA component of the project)			7 National Public Education & Outreach strategies prepared. Increased knowledge of climate change by all stakeholders through several materials developed and used (eg, Mainstreaming newsletter, handbook for journalists).
Date achieved	06/01/2003	06/30/2008		03/31/2009
Comments (incl. % achievement)	Satisfactory. Also, highly participatory approaches for the development of VCA, sectoral adaptation strategies and Regional Strategy raised public awareness.			
Outcome Indicator 4:	**National sectoral adaptation strategies and implementation action plans prepared in a participatory manner, and under consideration at appropriate governmental levels**			
Value (quantitative or Qualitative)	Some adaptation strategies prepared under the precursor CPACC project but based on empirical observations and discussions. Need for solid analyses to base adaptation strategies felt	Set of draft adaptation strategies ready for consideration by governments of pilot countries		National sectoral adaptation strategies were developed for Jamaica, Barbados, Belize and Guyana. Jamaica and Guyana specifically began to implementing some of the recommendations from the reports.
Date achieved	06/01/2003	06/30/2008		03/31/2009
Comments (incl. % achievement)	Moderately Satisfactory. Four national sector strategies completed: Jamaica (water) (Jan 2009), Guyana (agriculture) (March 2009), Barbados (tourism) (March 2009), and Belize (water) (March 2009). The strategies provided key recommendations based on sound data, which seek to inform decision makers how to mainstream CC consideration into sectoral policies. However, it is rated MS because the original goal was to develop country level multi-sectoral strategies in all countries, which was not achieved.			
Outcome Indicator 5:	**Plans prepared for more effective enforcement of existing policies and regulations, especially where these have implications for addressing climate change concerns**			
Value (quantitative or Qualitative)				An assessment of the current policy framework and future requirements to comply with the adaptation strategies was done as part of the analysis to prepare the sectoral adaptation strategies. The adaptation strategies are currently in the process of being presented to and adopted by the respective governments. Once this happens, plans for effective enforcement can be developed.
Date achieved	06/01/2003			03/31/2009

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Comments (incl. % achievement)	Moderately Satisfactory. Given the high-level government involvement and buy-in in the development of the strategies, it is likely that all the strategies will be adopted by the countries. The CCCCC is committed and will continue to play a key role to facilitate the adoption of the sectoral adaptation strategies by the respective governments and in scaling up this effort to other countries.			
Outcome Indicator 6:	**Regional coordination improved on climate change issues, and a regional strategy prepared**			
Value (quantitative or Qualitative)	Not much coordination between Caribbean countries on climate change issues, particularly at international fora such as COP meetings	Regional negotiating agenda developed in a harmonized manner and regional adaptation strategy relating to climate change prepared		Regional coordination has significantly improved through the consolidation and strengthening of the CCCCC. Regional position papers have been prepared and agreed upon prior to UNFCCC related meetings (e.g.,COP, SBSTA) once a year, sometimes twice a year. These are incorporated into the AOSIS negotiating position.
Date achieved	06/01/2003	06/30/2008		07/01/2009
Comments (incl. % achievement)	Satisfactory. CARICOM designated the CCCCC as the agency that coordinates the region's response to climate change. The Centre is recognized by the UNFCCC, UNEP, and other international agencies as a regional center of excellence and the focal point for climate change in the Caribbean.			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Component 1: Build Capacity to Assess Vulnerability and Risks Associated with Climate Change				
Indicator 1 :	**Climate and sea-level monitoring infrastructure upgraded with additional hardware and software**			
Value (quantitative or Qualitative)	No modernized network	Completed design and operational stations. Capacity to manage and analyze data generated; Data used to define adaptation strategies; regional data available on SLR, SST, coral bleaching;		CORS and 17 Sea Level Monitoring stations are operational Data stored by NOAA and RAC. CCCCC with participating governments will continue O&M of the network during life-span of instruments. CREWS is being repaired with NOAA's and UWI's support.

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Date achieved	06/01/2003	11/30/2007		03/31/2009
Comments (incl. % achievement)	The indicator has been fully achieved with the installation of CORS, Sea Level Monitoring stations and CREWS. Even further, institutional arrangements have been defined to ensure the O&M of the different stations.			
Indicator 2 :	**Training provided to Meteorological and Survey offices to maintain the upgraded stations and manage use of collected data**			
Value (quantitative or Qualitative)	No trained staff			Training was provided on the maintenance by CIMH on a country-by-country basis as equipment was installed. (2 trainees per country). In addition, two regional workshops were provided by UWI at St. Augustine for surveyors and meteorological officers in the application of CORS systems to support sea level monitoring (26 participants in Aug 2005 and 16 in Sep 2007)
Date achieved	06/01/2003			03/31/2009
Comments (incl. % achievement)	Adequate capacity was built in the region to ensure that systems are properly managed. Available data for 2007 and 2008 have been acquired and analyzed.			
Indicator 3 :	**Coral reef analyses and monitoring carried out in eight additional CARICOM countries**			
Value (quantitative or Qualitative)	Cora reef monitoring and analysis conducted under CPACC in three pilot countries: Belize, the Bahamas and Jamaica	Monitoring carried out in 8 additional CARICOM countries		Monitoring and analysis carried out in 7 Eastern Caribbean countries: Antigua and Barbuda, Dominica, Grenada, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent & the Grenadines, and Trinidad & Tobago. A regional training on monitoring techniques and data transmission was held in St. Lucia in 2007 & 2008.
Date achieved	06/01/2003			03/31/2009
Comments (incl. % achievement)	MACC facilitated the expansion and strengthening of the Coral Reef Monitoring network as proposed under CPACC.			
Indicator 4 :	**Global climate change models downscaled with resolution adequate for national level application (statistical and dynamical)**			
Value (quantitative or Qualitative)	No capacity to downscale global climate change models			A version of the PRECIS model was used to downscale climate change global models (MM5) to resolutions of 50km and 25km, now 20km is under process. These resolutions can capture the climate processes in most of the islands, depending on data availability of specific period for the

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
				analysis.
Date achieved				03/31/2009
Comments (incl. % achievement)	Capacity to downscale models has been built in the region: UWI at Mona and Cave Hill, Cuban Meteorological Institute, and the CCCCC.			
Indicator 5 :	**Climate Change impact models reviewed and selected**			
Value (quantitative or Qualitative)	No models have been reviewed for their application in the Caribbean			DSSAT and CROPWAT models were reviewed and selected to assess agricultural vulnerability in the region.
Date achieved	06/01/2003			03/31/2009
Comments (incl. % achievement)	Over 60 sectoral specialists were trained on the application and use of these models. Workshops were held to apply the models in the VCA development in Barbados in March and to test the field use of the methodology in Guyana in October 2005. Two workshops on agriculture modeling were held in Guyana in February 2007 in which 17 people were trained and in Guyana in April 2008 in which 37 people were trained.			
Indicator 6 :	**Experts trained in utilization of Climate projection and impact models**			
Value (quantitative or Qualitative)	Very limited capacity in utilization on climate projection and impact models			Two Caribbean experts trained in the use of PRECIS and MM5 models and in the analysis of outputs from the Earth Simulator in Japan. Hadley Centre experts provided training at the CCCCC to the CARICOM members, Panama CR, El Salvador, Honduras, Cuba, Mexico in 2006.
Date achieved	06/01/2003			03/31/2009
Comments (incl. % achievement)	In addition, climate modeling research became part of the curriculum of graduate program at the Cave Hill and the Mona campuses of the UWI.			
Indicator 7 :	**Workshop conducted for V&A approaches, and a refined and harmonized approach for assessing climate change vulnerability and adaptation policy-making developed**			
Value (quantitative or Qualitative)	No harmonized approach for carrying out vulnerability assessments			Vulnerability Assessment methodology was developed and made available. Workshops were held in Barbados and Guyana for regional focal points and sectoral practitioners with the objective to harmonize approaches and to implement the VCA to test the field use of the methodology. (March and October 2005)
Date achieved	06/01/2003			03/31/2009
Comments (incl. %				

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
achievement)				
Indicator 8 :	**Stakeholders trained in applying harmonized V&A approaches in country and sector settings**			
Value (quantitative or Qualitative)	No harmonized methodology is available			Two workshops in Trinidad and Tobago (37 participants) and St. Lucia (20 participants) were held to train stakeholders on V&A.
Date achieved	06/01/2003			03/31/2009
Comments (incl. % achievement)				
Indicator 9 :	**Country-level sectoral vulnerability and risk assessment studies completed**			
Value (quantitative or Qualitative)	No vulnerability assessments carried out	6 to 8 vulnerability and risk assessments will be carried out for selected SIDS in key economic sectors		Five pilot country-level Vulnerability and Risk Assessments (VCA) studies completed in Belize (March 2009), Barbados (March 2009), Guyana (March 2009), Jamaica (Oct 2008) and St. Vincent & the Grenadines (November 2008) In addition, a Review of Heath Effects of Climate Variability in the Caribbean was completed in March 2009.
Date achieved	06/01/2003	06/01/2003		03/31/2009
Comments (incl. % achievement)	The VCA studies provided key inputs to the national adaptation strategies developed for four of these countries under the project.			
Component 2: Build Capacity to Reduce Vulnerability to Climate Change				
Indicator 10 :	**Country-level Sector Adaptation strategies prepared**			
Value (quantitative or Qualitative)	No country-level adaptation strategies available		Adaptation strategies for Barbados (tourism), Guyana (agriculture) , and Belize and Jamiaca (water) prepared	Four national sector strategies completed: Jamaica (water) (Jan 2009), Guyana (agriculture) (March 2009), Barbados (tourism) (March 2009), and Belize (water) (March 2009).
Date achieved	06/01/2003		04/24/2007	03/31/2009

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Comments (incl. % achievement)	The strategies provided key recommendations based on sound data, which seek to inform decision makers how to mainstream CC consideration into sectoral policies.			
Indicator 11 :	**Institutional analysis for implementation of adaptation strategies completed, and Action Plan to support their implementation defined**			
Value (quantitative or Qualitative)	No strategies or institutional analysis available			Institutional analysis as well as the definition of an Action Plan were key outputs included in the preparation of the country-level sector adaptation strategies carried out in each of the four countries: Barbados, Belize, Guyana and Jamaica
Date achieved	06/01/2003			03/31/2009
Comments (incl. % achievement)				
Indicator 12 :	**Training Programs conducted to build capacity for adaptation plan preparation process**			
Value (quantitative or Qualitative)	No adaptation strategies and plans available			No training was undertaken due to time limitation. See comments
Date achieved	06/01/2003			03/31/2009
Comments (incl. % achievement)	The training is only feasible in a sequence of several steps: 1) The strategy including the action plan is developed, 2) The strategy is adopted by the Cabinet, 2) The implementation plan is drawn, 3) training is carried out. Since the strategies were completed near the closing of the project, none of them have been adopted by the Cabinet yet, but some (Guyana and Jamaica) are already being implemented to varying degrees.			
Indicator 13 :	**Technical study completed and guidelines for updating building codes, as well as special recommendations for updating CUBIC developed**			
Value (quantitative or Qualitative)	No study available			This was dropped at the restructuring.
Date achieved	06/01/2003			03/31/2009
Comments (incl. % achievement)	Technical study was completed under SPACC as part of the design phase of the pilot in St.Lucia, instead. This study complements CUBIC.			
Indicator 14 :	**Technical study to develop feasibility options for the introduction of risk reduction incentives completed, and sensitization campaign and workshops completed**			
Value (quantitative or Qualitative)	Risk management guideline and guidelines for incorporating climate risk assessment in EIA completed			This was dropped at the restructuring. Instead, a parallel Bank project, the ***Caribbean Catastrophe Risk Insurance Facility (CCRIF)*** **(effective May 2007)** has helped reduce

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
	under ACCC			the OECS countries vulnerability to natural disasters (earthquakes and hurricanes) by lowering the cost of insurance.
Date achieved	06/01/2003			03/31/2009
Comments (incl. % achievement)	A well-structured risk reduction facility, CCRIF, for the Caribbean was created outside of the MACC project with the support of the Bank World Bank resources were used to cover the entry fee and the first three years of insurance premiums for IDA-eligible OECS countries. There are currently 16 Caribbean Countries participating in the pool. CCRIF has been a success and the facility has been fulfilling its objective by providing payouts to eligible countries and it has been strengthened by offering new products.			
Component 3: Build Capacity to Effectively Access & Utilize Resources to Reduce Vulnerability to Climate Change				
Indicator 15 :	**A unified regional position paper (based on national and regional position papers), and a regional operational strategy developed for UNFCCC discussions**			
Value (quantitative or Qualitative)	No unified regional position			Regional position papers have been prepared and agreed upon prior to UNFCCC related meetings (e.g.,COP, SBSTA) once a year, sometimes twice a year. These are incorporated into the AOSIS negotiating position.
Date achieved	06/01/2003			03/31/2009
Comments (incl. % achievement)	The CCCCC plays a key role as it is the institutions assigned by CARICOM to take this role. CARICOM also requested the CCCCC to lead the preparation of regional position papers for Copenhagen.			
Indicator 16 :	**A regional long term strategy for adaptation to climate change prepared, showing regional and national actions for implementation of National Adaptation Plans**			
Value (quantitative or Qualitative)	No Regional Strategy on climate change available			A Regional Strategy for Climate Change has been developed and was adopted by the Heads of State on July 5, 2009
Date achieved	06/01/2003			07/05/2009
Comments (incl. % achievement)	The strategy, “Climate Change and the Caribbean: A Regional Framework for Achieving Development Resilient to Climate Change (2009-2015)”, defines the main pillars on which the region will focus, including mainstreaming adaptation to climate change and encouraging actions to reduce vulnerability, among others.			
Indicator 17 :	**Resource mobilization strategy prepared and donors meeting held**			
Value (quantitative or Qualitative)	No resource mobilization strategy available			The Regional Strategy addresses the issue of resources mobilization to implement the strategy itself. The specific definition of its implementation will be part of the work assigned to the CCCCC by CARICOM's Heads of State.

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
				Donors meeting will be held in the future. The CCCCC has prepared a business plan for the next five years which outlines the fundraising strategy.
Date achieved	06/01/2003			07/01/2009
Comments (incl. % achievement)	The CCCCC by itself has been quite successful in raising resources to fund its activities in the region: funding has been received from Italian, Greek, German Governments, UNITAR, UNEP, USAID among others.			
Component 4: Public Eduction and Outreach				
Indicator 18 :	**Public education and awareness materials developed and disseminated.**			
Value (quantitative or Qualitative)	PEO strategies for 7 countries prepared under CPACC. ACCC had initialized Regional PEO strategy	Finalize and implement Regional Strategy, implement national strategies and undertake evaluation of effectiveness of the PEO strategies		7 National PEO strategies prepared. The Centre is committed to support in implementation of national PEO strategies. Several materials were developed and used (eg, Mainstreaming newsletter, handbook for journalists) that helped increase the knowledge of climate change, the CCCCC and MACC by all stakeholders.
Date achieved	06/01/2003	03/31/2009		03/31/2009
Comments (incl. % achievement)	Considerable resources were expended towards various PEO activities early on in the project cycle when little content in the form of project-generated data/information was available. Because the PEO activities were not driven by the content and depth of other project activities the outcome from PEO activities was not commensurate with the resources expended.			
Indicator 19 :	**Website improved and managed to serve as clearinghouse point, including access to a digital resource climate change library housed in the PIU.**			
Value (quantitative or Qualitative)				The website was revamped and managed by the CCCCC. The website address is: http://www.caribbeanclimate.bz. Clearing house function partially developed. The Government of Germany is supporting the CCCCC with a specialist in the development of the clearinghouse, who will start working in 2009.
Date achieved				03/31/2009
Comments (incl. % achievement)				
Indicator 20 :	**Workshops conducted and Project outputs disseminated to secure participatory approach to vulnerability assessments and adaptation strategy development**			
Value				All outputs including VCA, sectoral adaptation strategies

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
(quantitative or Qualitative)				and Regional Strategy developed with highly participatory approaches.
Date achieved				03/31/2009
Comments (incl. % achievement)	In addition to in-country dissemination for country-specific studies, project outputs will be disseminated through the CCCCC web site (clearinghouse).			
Indicator 21 :	**Course materials developed for educational curricula schools and UWI**			
Value (quantitative or Qualitative)	No course material available			Course material developed for M.Sc. program at the Centre of Resource Management and Environmental Studies (CERMES) at UWI. This program is operational since 2006. Students undertake field studies annually on climate change matters.
Date achieved	06/01/2003			03/31/2009
Comments (incl. % achievement)				
Indicator 22 :	**Separate M&E system for the PEO component implemented.**			
Value (quantitative or Qualitative)				The PEO strategy started by the ACCCC project was finalized under MACC. National PEO strategies were prepared for seven countries. However, a separate M&E system was not done due to resource constraints.
Date achieved				
Comments (incl. % achievement)				
Component 5: Project Management				
Indicator 23 :	**PIU established, staffed and functional**			
Value (quantitative or Qualitative)				PIU was established in the CCCCC with full-time project manager, a junior technical assistant, procurement staff, and financial management staff.
Date achieved	06/01/2003			04/30/2008
Comments (incl. % achievement)				

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 24 :	**Monitoring and evaluation systems in place and assisting in improving project management**			
Value (quantitative or Qualitative)				Fiduciary system (accounting, procurement, financial management) and the activity-specific progress monitoring system in place. In addition, AOP, Quarterly reports, field missions once/twice a year, MTR, and End-of-Project review are used as inputs to M&E.
Date achieved				04/30/2008
Comments (incl. % achievement)				

Annex 3. Economic and Financial Analysis

(including assumptions in the analysis)

The Caribbean Small Island Developing States (SIDS) have been identified as among the most vulnerable to the anticipated impacts of climate change. The expected sea level rise, increase in sea surface temperature, and altered patterns of precipitation are likely to hit these countries the hardest. The benefits associated with increasing resilience to climate change are enormous.

In recent analysis, the World Bank estimated that the aggregate losses incurred by the Carribean SIDS as a result of storms over the period 1979-2005 are US$613 million annually. While estimating the future climate scenario and the potential economic impacts on the Caribbean is difficult, a recent estimate[18] of the economic consequence of the potential impacts of climate change on CARICOM countries concluded that the damage could be in the order of US$11.2 billion annually ca. 2080, that is equivalent to 11.3% of all CARICOM countries total annual GDP (in 2007 US$ prices) (Toba, 2009). The same estimate for for the 12 countries which participated in MACC is US$9.8 billion per year conservatively. (See Table 2)

With the total project cost including co-financing of $10.55 million, the MACC project has contributed to the countries efforts to prepare proactive measures to strategically adapt to the impacts of climate change. The incremental cost analysis done at the time of design (with or without GEF funded interventions), indicated that the amount needed to move the agenda in the region toward mainstreaming climate change considerations into development planning was negligible given the significant risks the countries face individually and collectively. The conclusion at this time is not different. Moreover, models to predict impacts of climate change have improved and more data is available, reducing the uncertainty around the estimation of impacts.

[18] Toba, Natsuko. “Potential Economic Impacts of Climate Change in the Caribbean Community”, Assessing the Potential Consequences of Climate Destabilization in Latin America, Sustainable Development Working Paper 32, June 2009.

Table 2: Estimated Total Annual Impacts of Climate Change on 12 CARICOM Countries circa 2080 (in thousand US$ 2007 prices)

	Antigua and Barbuda	*Bahamas*	*Barbados*	*Belize*	*Dominica*	*Grenada*	*Guyana*	*Jamaica*	*St Kitts and Nevis*	*St Lucia*	*St Vincent and The Grenadines*	*Trinidad and Tobago*	***Pre Sub Total***	***Sub Total***	***Total***
Total GDP loss due to climate change related disasters															**3,566,437**
Tourist expenditure	17,430	97,380	39,438	10,604	3,116	8,103	65,354	74,235	5,524	16,830	4,940	13,451		*446,994*	
Employment loss	2,092	14,972	3,380	692	227	213	42	5,903	851	1,444	357	4,147		*58,091*	
Government loss due to hurricane	2,186	12,661	5,933	2,583	937	994		22,597	1,334	1,703	1,022	2,158		*81,331*	
Flood damage														*363,197*	
of which Agricultural loss													*1,712*		
Drought damage														*3,750*	
of which Agricultural loss													*523*		
Wind storm damage														*2,612,176*	
of which Agricultural loss													*1,903*		
Death (GDP/capita) due to increased hurricane related disaster	0.3	2	2	19	22	0.6	0.1	14	0.2	1	1	2		*92*	
Floods DALY (GDP/ capita)														*806*	
Sea level rise															**764,814**
Loss of land	21	467	20	1,065	35	16	9,188	506	17	29	18	239		*20,238*	
Hotel room replacement cost	1,747	8,272	3,171	2,748	497	459	389	13,307	936	2,120	1,002	2,869		*46,060*	
Housing replacement	3,059	11,970	9,881	10,876	2,649	3,957	27,486	97,466	1,771	6,075	4,378	47,888		*566,977*	
Electricity Infrastructure Loss	4,905			1,876	2,068	3,384		13,179	660	5,442	1,622			*33,137*	
Telephone line infrastructure Loss investment need	98	360	347	86	54	84	283	879	64	131	58	832		*3,942*	
Water connection infrastructure loss investment	48	199	169	170	44	64	391	1,554	30	102		747		*6,706*	
Sanitation connection infrastructure loss investment needs	87	359	296	153	67	114	577	2,339	51	162		1,436		*8,953*	
Road infrastructure loss investment needs	3,070		4,217					55,331			2,185			*76,145*	
Rail infrastructure loss investment needs							1,082	1,574						*2,655*	
Temperature rise															**5,150,977**
Loss of tourist expenditure	78,754	380,042	177,983	41,426	11,640	36,401	26,217	313,968	16,745	76,182	23,575	95,253		*4,027,352*	
Loss of fish export (rising temperatures, hurricanes, and sea level)	259	31,966	306	4,348	0.4		22,811	3,268	68	-	159	5,437		*93,824*	
Loss of coral reefs (rising temp., hurricanes, and sea level)														*941,627*	
Loss of tourist sea related tourism entertainment expenditure	2,631	37,669	3,596	1,600	470	1,223	7,982	13,836	1,004	2,012	746	2,030		*88,174*	
Agricultural loss	3,037	12,469	12,549	18,708	3,597	2,557	17,365	46,507	959	3,917	2,958	6,634		*220,516*	**220,516**
Loss of Maize production				2,381			298						*2,679*		
Agricultural Export loss	84	3,668	5,774	9,683	1,222		15,173	21,276	851	2,770	1,620	9,258	*74,411*		
Water Stress: Cost of additional water supply	174	227	-	618	50	125	2,951	4,309	-	77		2,722		*104,010*	**104,010**
Health															**7,082**
Malaria DALY (GDP/capita)														*3*	
Other diseases costs	38	150	123	136	33	49	343	1,217	22	76	55	598		*7,079*	
Total	119,635	609,165	261,411	97,707	25,505	57,744	182,461	671,988	30,036	116,302	43,075	186,442			

	119,635	609,165	261,411	97,707	25,505	57,744	182,461	671,988	30,036	116,302	43,075	186,442	**9,813,834**

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Benoit Blarel		LCSES	TTL
Supervision/ICR			
Harideep Singh	Sr. Agricultural Specialist	LCSAR	TTL
Walter Vergara	Lead Engineer	LCSEN	TTL
Fabiola Altimari Montiel	Sr Counsel	LEGLA	
Mark A. Austin	Senior Operations Officer	LCSAR	
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	E T Consultant	LCSEN	
Patricia De la Fuente Hoyes	Senior Finance Officer	LOAFC	
Judith C. Morroy	Consultant	LCSPT	
Emmanuel N. Njomo	Consultant	LCSFM	
Ian Roy Noble	Lead Climate Change Specialist	ENV	
Enos Esikuri	Sr. Environmental Specialist	LCSEN	ICR TTL
Keiko Ashida Tao	Operations Analyst	LCSEN	ICR co-author

(b) Staff Time and Cost

	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including
Lending		

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

Annex 5. Beneficiary Survey Results
(if any)

Annex 6. Stakeholder Workshop Report and Results
(if any)

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

Borrower (CCCCC) discussed and commented on the draft ICR with the team, and both CCCCC and CAROCOM Secretariat were provided a final draft of the report on September 02, 2009 for comments. Todate further comments have been received from CCCCC and have been incorporated in the text.

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

NOAA provided and incorporated comments (on September 16, 2009) in the text under section 3.2.

Annex 9. List of Supporting Documents

1. Project Appraisal Document, March 2003
2. Project Operations Manual, February 2003
3. Implementation Status and Results Reports, #1-15
4. Mid Term Review Aide Memoire, August 2006
5. Project Paper on Restructuring the Caribbean: Mainstreaming Adaptation to Climate Change Project, April 3, 2007
6. End-of-Project Review of the Mainstreaming Adaptation to Climate Change (MACC) Project, by Carlos G. Santos, March 2009
7. Final Report: Mainstreaming Adaptation to Climate Change (MACC) Project (April 2003—March 2009), by Joseph McGann, July 2009
8. National Integrated Water Resources Management Policy for Belize, September 2008
9. Review of Health Effects of Climate Variability and Climate Change in the Caribbean, March 2009
10. Final Report of PRECIS Meeting, by Dale Rankine, University of the West Indies, Mona, Jamaica, December 1-2, 2005
11. Strengthening Coral Reef Resilience to Climate Change Impacts—Phase One Final Project Report, by Austin Bowden-Kerby and Lisa Carne, March 31, 2009
12. National Adaptation Strategy to Address Climate Change Tourism Sector in Barbados: Synthesis of the Technical Reports, February 2009 and Action Plan, March 2009, prepared by the Centre for Resource Management and Environmental Studies, University of the West Indies, Cave Hill Campus, Barbados
13. National Adaptation Strategy to Address Climate Change in the Water Sector in Belize:
14. Strategy and Action Plan, by the Belize Enterprise for Sustainable Technology (BEST), March 2009
15. National Adaptation Strategy to Address Climate Change in the Agriculture Sector of Guyana: Synthesis and Assessment Report, and Strategy and Action Plan, by the Development Policy and Management Consultants, February 2009
16. Development of a National Water Sector Adaptation Strategy to Address Climate Change in Jamaica, by ESL Management Solutions Limited, January 2009
17. Pilot Vulnerability and Capacity Assessment Study Final Report for St. Vincent and the Grenadines, by Ottis Joslyn, in Collaboration with St. Vincent and the Grenadines National Trust and the Environmental Services Unit of the Ministry of Health and the Environment, November 2008

18. Vulnerability and Capacity Assessment for Jamaica, October 2008

19. Vulnerability and Capacity Assessment: Impacts of Climate Change on Guyana's Agriculture Sector, by Guysuco, March 2009

20. Vulnerability and Capacity Assessment: the Vulnerability of Water Resources to Climate Change in the North Stann Creek Watershed in Belize, Belize Enterprise for Sustainable Technology (BEST), February 2009

21. Climate Change and the Caribbean: A Regional Framework for Achieving Development Resilient to Climate Change (2009-2015). Caribbean Community Climate Change Centre (CCCCC). May 2009.

22. Climate Change and Tourism in Barbados: "An Assessment of the Perceptions of Climate Change Risk and Adaptation Capacities in the Tourism Sector in Speightstown", by Centre for Resource Management and Environmental Studies Faculty of Pure and Applied Sciences, University of the West Indies, Cave Hill Campus, November 2008

23. Review of Health Effects of Climate Variability and Climate Change in the Caribbean. By Michael Taylor, A. Chen & W. Bailey; CSG, UWI; and CEHI. Caribbean Community Climate Change Center. March 2009.

24. Mainstreaming adaptation to climate change (MACC) Project: Component 4, Public Education and Outreach Mid-Term report, 2003-06. CARICOM and World Bank. July 2006.

25. Report of Component 4: Public Education and Outreach (PEO), by Anthony Deyal, July 2006

26. Toba, N. (2009): Potential Economic Impacts of Climate Change in the Caribbean Community, in: LCR Sustainable Development Working Paper No.32, *Assessing the Potential Consequences of Climate Destabilization in Latin America*.

27. Vulnerability and Capacity Assessment Methodology: A guidance manual for the conduct and mainstreaming of climate change vulnerability and capacity assessments in the Caribbean, by Roger S. Pulwarty and Natalie Hutchinson, August 2008

MAP

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