ADAPTATION FUND

AFB/PPRC.6/4
August 31, 2011

Adaptation Fund Board
Project and Programme Review Committee
Sixth Meeting
Bonn, September 14, 2011

PROPOSAL FOR BELIZE

I. Background

1. The Operational Policies and Guidelines for Parties to Access Resources from the Adaptation Fund, adopted by the Adaptation Fund Board, state in paragraph 41 that regular adaptation project and programme proposals, i.e. those that request funding exceeding US$ 1 million, would undergo either a one-step, or a two-step approval process. In case of the one-step process, the proponent would directly submit a fully-developed project proposal. In the two-step process, the proponent would first submit a brief project concept, which would be reviewed by the Project and Programme Review Committee (PPRC) and would have to receive the approval by the Board. In the second step, the fully-developed project/programme document would be reviewed by the PPRC, and would finally require Board's approval.

2. The Templates Approved by the Adaptation Fund Board (Operational Policies and Guidelines for Parties to Access Resources from the Adaptation Fund, Annex 3) do not include a separate template for project and programme concepts but provide that these are to be submitted using the project and programme proposal template. The section on Adaptation Fund Project Review Criteria states:

> *For regular projects using the two-step approval process, only the first four criteria will be applied when reviewing the 1st step for regular project concept. In addition, the information provided in the 1st step approval process with respect to the review criteria for the regular project concept could be less detailed than the information in the request for approval template submitted at the 2nd step approval process. Furthermore, a final project document is required for regular projects for the 2nd step approval, in addition to the approval template.*

3. The first four criteria mentioned above are:
   1. Country Eligibility,
   2. Project Eligibility,
   3. Resource Availability, and
   4. Eligibility of NIE/MIE.

4. The fifth criterion, applied when reviewing a fully-developed project document, is:
   5. Implementation Arrangements.

5. According to the Adaptation Fund Board Decision B.12/10, a project or programme proposal needs to be received by the secretariat no less than nine weeks before a Board meeting, in order to be considered by the Board in that meeting.

6. The following project concept titled "Belize Marine Conservation and Climate Adaptation Initiative" was submitted for Belize by the World Bank (WB), which is a Multilateral Implementing Entity of the Adaptation Fund. This is the first submission of the concept. It was received by the secretariat in time to be considered at the 15th Adaptation Fund Board meeting. The secretariat carried out a technical review of the project proposal, assigned it the diary number BIZ/MIE/Coastal/2011/1 and filled in a review sheet.

7. In accordance with a request to the secretariat made by the Adaptation Fund Board in its 10th meeting, the secretariat shared this review sheet with WB, and offered it the opportunity of providing responses before the review sheet was sent to the Project and Programme Committee of the Adaptation Fund.

8. The secretariat is submitting to the Project and Programme Review Committee the summary of the project, prepared by the secretariat, in the following section. The secretariat is also submitting to the Committee the technical review sheet and the responses provided by WB, in an addendum to this document.

Project Summary

Belize – Belize Marine Conservation and Climate Adaptation Initiative
Implementing Entity: *World Bank*
Project/Programme Execution Cost: USD 950,000
Total Project/Programme Cost: 9,220,000
Implementing Fee: USD 780,000
Financing Requested: USD 10,000,000

Project/Programme Background and Context:

The proposed project intends to bring innovative financing to bear on the climate change and fiscal challenges facing Belize. Belize has incredible natural resources (including the second longest Barrier Reef in the world) but is also highly vulnerable to climate change impacts because of its location. The Initiative within the project intends to raise US$ 100 million in order to set up a trust that would finance (in perpetuity) ecosystem-based adaptation measures that enhance the resilience of the critical Barrier Reef ecosystem. The proposal includes (i) financing the initial climate adaptation measures during the first five years, (ii) setting up the Marine Conservation and Climate Adaptation Trust (MCCAT), and (iii) demonstrating how to address the challenges of climate change and high debt in vulnerable developing countries.

Component 1: Implementation of initial marine conservation and climate adaptation measures (USD 7,870,000)

The objective of this component is to implement the initial priority set of climate adaptation and conservation measures to improve the overall health of the reef ecosystem in order to increase the climate resilience of coral reefs. These activities would be scaled up (into a Program of Activities) once the MCCAT financing mechanism is fully operational. The activities will be carefully selected based on the concept that the best chance of enhancing the resilience (resistance and recovery potential) of natural systems to climate change impacts is to reduce local stressors which undermine the innate resilience to external shocks that is characteristic of healthy, robust ecosystems and to strengthen the coral reefs thermal resilience.

Component 2: Establishment and capitalization of a sustainable financing mechanism for marine conservation and climate adaptation (USD 400,000)

The objective of this component is to establish a sustainable financing mechanism for climate adaptation measures for the Belize Barrier Reef System and associated marine and coastal ecosystems through the establishment and capitalization of the Marine Conservation and Climate Adaptation Trust (MCCAT). The Trust would be capitalized to a target figure of US $100 million using resources from bilateral, NGOs, and private partners. The Adaptation Fund resources would not be used to capitalize the Trust but would allocate US $0.4 million to establishing the Trust into which other partners would contribute resources for financing climate action into the future. In addition, the MCCAT would have a unique strategy to redirect financial resources that are currently used to service Belize's external debt towards significant in-country investment for a program of specific adaptation measures to increase the climate resilience of the reef and associated marine and coastal ecosystems. Future adaptation measures to be financed by the MCCAT will adhere to the Trust's objectives with a specific focus defined in multi-year strategies and the selection criteria and procedures set forth in its Operational Policies and Guidelines that will be prepared during the next phase of project preparation.

REQUEST FOR PROJECT/PROGRAMME FUNDING FROM ADAPTATION FUND

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project/programme must be fully prepared (i.e., fully appraised for feasibility) when the request is submitted. The final project/programme document resulting from the appraisal process should be attached to this request for funding.

Complete documentation should be sent to

The Adaptation Fund Board Secretariat
1818 H Street NW
MSN G6-602
Washington, DC. 20433
U.S.A
Fax: +1 (202) 522-3240/5
Email: secretariat@adaptation-fund.org

CURRENCY EQUIVALENTS

Exchange Rate Effective June 1, 2011

Currency Unit = Belize Dollar
BZD 1.975 = US$1

FISCAL YEAR

April 1 – March 31

ABBREVIATIONS AND ACRONYMS

ASO	April, September, October
BSIF	Belize Social Investment Fund
CBO	Community Based Organizations
CEO	Chief Executive Officer
CO_2	Carbon Dioxide
CPS	Country Partnership Strategy
CZM	Coastal Zone Management
DSA	Debt Sustainability Analysis
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
ENSO	El Niño Southern Oscillation
EU	European Union
FAO	Food and Agriculture Organization
FMA	February, March, April
FM	Financial Management
GDP	Gross Domestic Product
GEF	Global Environment Facility
GOB	Government of Belize
IBRD	International Bank for Reconstruction and Development
IADB	Inter-American Development Bank
IMF	International Monetary Fund
IPCC	Inter-government Panel on Climate Change
ISN	Interim Strategy Note
IUCN	International Union for Conservation of Nature
MCCAI	Marine Conservation and Climate Adaptation Initiative
MCCAT	Marine Conservation and Climate Adaptation Trust
MED	Ministry of Economic Development, Commerce and Industry, and Consumer Protection
MJJ	May, June, July
MLLGRD	Ministry of Labour, Local Government and Rural Development
MNRE	Ministry of Natural Resources and the Environment
MoF	Ministry of Finance
MPA	Marine Protected Area
MTDS	Medium Term Development Strategy
M&E	Monitoring and Evaluation
NDJ	November, December, January

NGO	Non Governmental Organization
NPAS	National Protected Area System
NAPSP	National Protected Area System Plan
NPESAP	National Poverty Elimination Strategy and Action Plan
NPLG	National Policy on Local Governance
PAU	Project Administration Unit
PDO	Project Development Objective
PIU	Project Implementation Unit
PR	Procurement
RFP	Request for Proposal
SST	Sea Surface Temperature
TA	Technical Assistance
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
WRI	World Resources Institute

ADAPTATION FUND

DATE OF RECEIPT:
ADAPTATION FUND PROJECT ID:
(For Adaptation Fund Board Secretariat Use Only)

PROJECT/PROGRAMME PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

PROJECT/PROGRAMME CATEGORY:	REGULAR PROJECT
COUNTRY/IES:	BELIZE
TITLE OF PROJECT/PROGRAMME:	BELIZE MARINE CONSERVATION AND CLIMATE ADAPTATION INITIATIVE
TYPE OF IMPLEMENTING ENTITY:	MULTILATERAL IMPLEMENTING ENTITY
IMPLEMENTING ENTITY:	WORLD BANK
EXECUTING ENTITY/IES:	BELIZE SOCIAL INVESTMENT FUND
AMOUNT OF FINANCING REQUESTED:	$10 MILLION (IN U.S DOLLARS EQUIVALENT)

PROJECT / PROGRAMME BACKGROUND AND CONTEXT:

Summary: *The Belize Marine Conservation and Climate Adaptation Initiative is a multi-partner ambitious initiative that would bring innovative financing to bear on the climate change and fiscal challenges facing Belize. Belize has incredible natural resources (including the longest Barrier Reef -part of the Meso-American Barrier Reef-in the Americas and the second longest in the world) but is also highly vulnerable to climate change impacts because of its location. Belize is also highly indebted and as such allocating resources to efforts aimed at climate resilience and conservation of natural resources remains a big challenge. The Initiative is targeting to raise US$ 100 million in order to set up a trust that would finance (in perpetuity) ecosystem-based adaptation measures that enhance the resilience of the critical Barrier Reef ecosystem. As a partner in this Initiative, the Adaptation Fund would play a crucial and catalytic part by (i) financing the initial climate adaptation measures during the first five years, (ii) setting up the Marine Conservation and Climate Adaptation Trust (MCCAT), an innovative sustainable financing mechanism that would continue to finance the implementation of adaptation measures into perpetuity, and (iii) demonstrating to other countries how to address the twin challenges of climate change and high debt in vulnerable developing countries.*

Global and regional climate change impacts

1. Belize is situated on the Caribbean coast of Central America with Mexico to the north and Guatemala to the west and south. It lies between 15º45´ and 18º30´ north latitude and 87º30´ and 89º15´west longitude. Total national territory covers 46,620 square kilometres, which includes 22,960 km^2 (8,867 miles^2) of land and 1,060 cays. Belize has a typically moist tropical climate. In accordance with the United Nations Framework Convention on Climate Change (UNFCCC), Belize chose the year 1994 for its first National Inventory of Sources and Sinks of Greenhouse Gases. The results of the Inventory reveal that Belize is a net sink for greenhouse gases, i.e., it absorbs more than it emits. Yet, Belize is extremely vulnerable to adverse impacts of climate change. Therefore, the national objective is focused on identifying feasible adaptation options to address climate change. Through its membership in the Caribbean Community (CARICOM), Belize is a partner in the Alliance of Small Island States (AOSIS). Its UNFCCC negotiating position is therefore coordinated within this body. Belize is also a member of the Central American Commission on

Environment and Development (CCAD). It attempts to reconcile the negotiating positions of these two groups into a larger unified voice to achieve the objectives of the Convention.

2. Global climate change remains arguably the most serious challenge to the development aspirations of the CARICOM countries. Observational data for the Caribbean already indicates an approximate increase in sea surface temperature of about 0.6°C above the global mean temperature in the 20th century. At the same time, mean sea level rose over the past century between 2 and 6 mm/yr. In addition, rainfall variability that appears to be closely related to the El Niño Southern Oscillation (ENSO) has increased.[1] Due to these changes that have already taken place, climate change related events have started profoundly impacting the region's geophysical, biological and socio-economic systems and depleting national budgets. It is 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 increases 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 will be 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 as a result of climate change (Gardner et al., 2003, 2005). Loss of coral will also affect livelihoods, for example those dependent on tourism and fisheries. Sea-level rise will also be 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). Belize, like most of the countries in the Caribbean, is also low-lying, with some coastal areas below mean sea-level. In all countries a high percentage of the population and much critical infrastructure are located along the coast[2]. These factors will be exacerbated by the projected adverse effects of climate change.

3. The United Nations Human Development Report (2008) and the State of the World Report (2009) of the World Watch Institute have identified a 2°C increase in the average global temperature as the threshold beyond which irreversible and dangerous climate change impacts become unavoidable. On the basis of the vulnerabilities of the marine and coastal ecosystems, this threshold for irreversible damage is probably even lower for the Caribbean region. While most nations and natural capital assets in the region are likely to be heavily impacted, Belize presents an early case of potential negative ecosystem-wide impacts on its coral reef induced by climate change-related damages that are further exacerbated by unsustainable uses of reef resources. Belize is a country with extensive, low-lying, coastal areas vulnerable to climate-related disasters through tropical cyclones and flooding. Furthermore, the economy is small and concentrated, along with most centers of population, in these very areas that are most vulnerable. Consequently, the

[1] Intergovernmental Panel on Climate Change (IPCC 2007), "Fourth Assessment Report, Climate Change 2007: Synthesis Report, An Assessment of the Intergovernmental Panel on Climate Change http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf

[2] See the First National Communication to the UNFCCC sub mitted by CARICOM countries.

UNFCCC recognizes Belize as one of those countries most vulnerable to the adverse impacts of climate change due to it: (i) having a long, low-lying coastline, (ii) having over 1,060 small islands, (iii) having the second longest barrier reef in the world (and the largest reef in the Western Hemisphere and the Americas), and 17,276 sq. km. of forest cover, each of which support fragile ecosystems, and, (iv) being very prone to climate-related disasters, especially hurricanes. Hence the vulnerability of the country to the foreseeable adverse physical, environmental, and economic impacts of climate change indicates that priority attention must be directed towards implementation of viable adaptation measures targeting the most vulnerable sectors and ecosystems.

4. Indeed recent climate trends and projections of future climate for Belize indicate that climate change will exert increasing pressure on the country[3]: (a) **Temperature**: Mean annual temperature has increased by 0.45°C since 1960, an average rate of 0.10°C per decade. The average rate of increase is most rapid in the wet seasons (MJJ and ASO) at 0.14–0.15°C per decade and slower in the dry seasons (NDJ and FMA) at 0.08–0.09°C per decade. The frequency of particularly hot days and hot nights has increased significantly since 1960 in every season. The average number of 'hot' days per year in Belize has increased by 67 (an additional 18.3% of days) between 1960 and 2003. More importantly, the mean annual temperature is projected to increase by 0.8 to 2.9°C by the 2060s, and 1.3 to 4.6 degrees by the 2090s. The range of projections by the 2090s under any emissions scenario is 1.5–2°C; (b) **Precipitation**: Mean annual rainfall over Belize has decreased at an average rate of 3.1mm per month per decade since 1960, but this trend is not statistically significant. Whilst all seasons appear to have shown decreasing precipitation trends since 1960, only FMA has a statistically significant trend. Projections of mean annual rainfall from different models are broadly consistent in indicating decreases in rainfall for Belize. Projections vary between -64% and +20% by the 2090s with ensemble median values of -11 to -22%; (c) **Tropical cyclones**: Whilst evidence indicates that tropical cyclones are likely to become, on the whole, more intense under a warmer climate as a result of higher sea-surface temperatures, there is great uncertainty in changes in frequency, and changes to storm tracks and their interactions with other features of climate variability (such as the El Niño Southern Oscillation) which introduces uncertainty at the regional scale (Christensen *et al.*, 2007); and (d) **Sea level rise**: The coastal lowlands in Belize are highly vulnerable to sea-level rise. Sea-level in this region is projected by climate models to rise by the following levels by the 2090s, relative to 1980-1999 sea-level:0.18 to 0.43m under SRES B1, 0.21 to 0.53m under SRES A1B, and 0.23 to 0.56m under SRES A2.

Climate challenge to the Belize Barrier Reef

5. Belize is a small, upper-middle income country with a population of 310,000 and a per-capita GDP of US$4,115 (2009). It is remarkably diverse ecologically with substantial natural capital along its coast, represented by the largest coral barrier reef and associated ecosystem in the Americas[4], as well as significant areas of mangroves, tropical forest and inland wetlands. The Belize Barrier Reef has been classified as one of the world's marine hotspots with an abundance of globally and locally significant biodiversity[5]: it consists of six UNESCO World Heritage sites and is home to a variety of endemic species, many of them endangered and under some degree of protection, including sea turtles (green, loggerhead, leatherback, and hawksbill turtles), queen

[3] McSweeney, C., M. New & G. Lizcano. 2008. Belize: UNDP Climate Change Country Profile. University of Oxford, UK.
[4] A UNESCO world heritage site.
[5] The reef system is home to more than 66 stony coral species, 350 mollusk species and more than 500 fish species.

conch, West Indian manatee[6], splendid toadfish, crocodiles (American and Morelet's), Nassau grouper, and black coral. Two of the most important reef-building coral species in the Caribbean─elkhorn (*Acropora palmata*) and staghorn (*Acropora cervicornis*)─are listed as threatened under the Endangered Species Act (WWF, 2011). Locally, the reef system provides livelihoods for communities and contributes to the national economy through fisheries and growing tourism revenues. It also shelters the coastal zones from intense tropical storms and high velocity winds that cause erosion and coastal damage. It has been estimated that the value of ecosystem services (fishing, tourism, shoreline protection) generated by the coral reefs and mangroves contributes between 15 and 22 percent of GDP in Belize.

6. **Belize derives very large benefits from the ecosystem services generated by the coral reefs and mangroves.** The Belize Barrier Reef not only supports vibrant tourism and fishing industries, but also shelters Belize's coast from high-velocity winds that cause erosion and coastal damage. According to the World Resources Institute (WRI 2008), about two-thirds of the mainland coast is protected by coral reefs. The degree of protection varies with reef type, depth and distance from shore, as well as with the elevation and slope of the shore, the geological origin of the area, and the wave energy along the coast. Emergent reefs, such as the Barrier Reef, can mitigate over three-quarters of wave energy. Reefs close to shore provide the most protection, because waves have less chance to regenerate. The Barrier Reef off Ambergris Caye, for example, contributes about 40 percent of the coast's stability due to its close proximity to the shore. The atolls and Barrier Reef, although further offshore, also contribute to the protection of the cayes and mainland coast. Mangroves protect the immediately adjacent shoreline and mitigate the force of both the waves and the storm surge, protecting 50 percent of the mainland's coastline and 75 percent of the cayes' shoreline.

7. **Belize is highly vulnerable to natural hazards and climate change. Belize's long low-lying coastal areas a**re especially vulnerable to more intense and frequent tropical storms and hurricanes, flood damage, and rising sea levels. Like the rest of the Caribbean, Belize has experienced frequent natural disasters of catastrophic proportions, and most recently suffered the impact of a Category 1 hurricane (Richard in October 2010) and widespread flooding in 2008. Tropical Storm Arthur (May 2008) caused extensive damage to infrastructure and the agriculture sector. Hurricanes Keith (2000) and Iris (2001) struck Belize each causing damages reaching 45% and 25% of GDP, respectively. In 1961, Hurricane Hattie destroyed Belize City and prompted the Government to build a new administrative capital 50 miles inland in Belmopan. Beyond economic and social losses, climate-related natural disasters have contributed to large fiscal deficits and debt accumulations that required Belize to restructure its public debt in 2007. These severe budget constraints, in turn, have limited Belize's ability to finance climate change adaptation and mitigation activities. Of the ecosystems in Belize, the barrier reef is assessed as being highly vulnerable and identified as a "Critical Area for Conservation: [with] high species richness and potentially severe climate-induced destabilization."[7]

8. Several indicators attest to this: severe coral mortality induced by warmer sea surface temperatures (Fig. 1) and increasing ocean acidification; reduction of coral cover; and reduction in fisheries annual catch.[8] While some of these indicators respond to local stressors (e.g.,

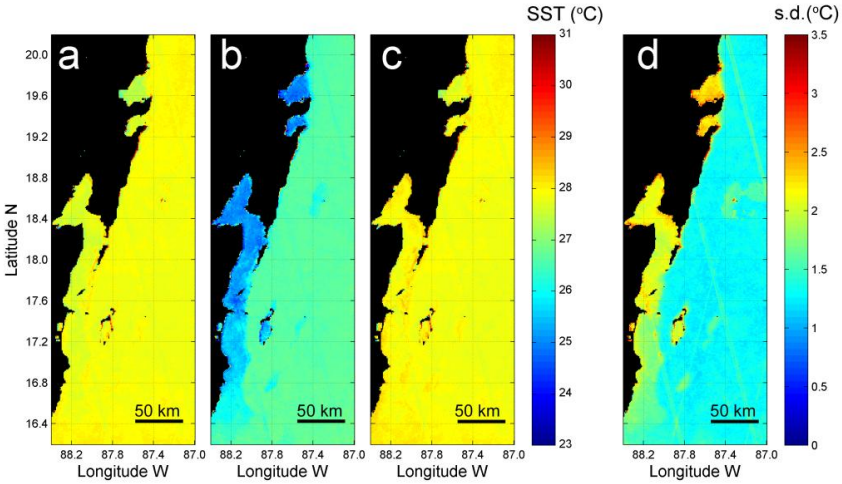
[6] The Barrier Reef is home to one of the world's largest populations of manatees with an estimated population of 1,000 to 1,500.
[7] From CATHALAC/USAID study of regional biodiversity and climate change, 2008.
[8] It is estimated that between 60 to 70 endemic species of corals in the Caribbean are endangered.

sedimentation, nutrient pollution from agrochemicals, overfishing, etc.), they are all exacerbated by the consequences of global warming.

9. Gradual and consistent increases in sea surface temperatures have yielded increasingly frequent bleaching events (1993, 1998, 2003, 2005, 2008, 2009, and 2010), which cause wide-scale bleaching throughout the Caribbean Region. Recovery from such large scale coral mortality will depend on the extent to which coral reef health has been compromised and the frequency and severity of subsequent stresses to the system. More than one bleaching event over a short timeframe can be devastating (Christensen et al. 2007).

Figure 1. Sea surface temperature patterns in Northern Belize

(a) average, (b) minimum monthly mean, (c) maximum monthly mean, and (d) standard deviation

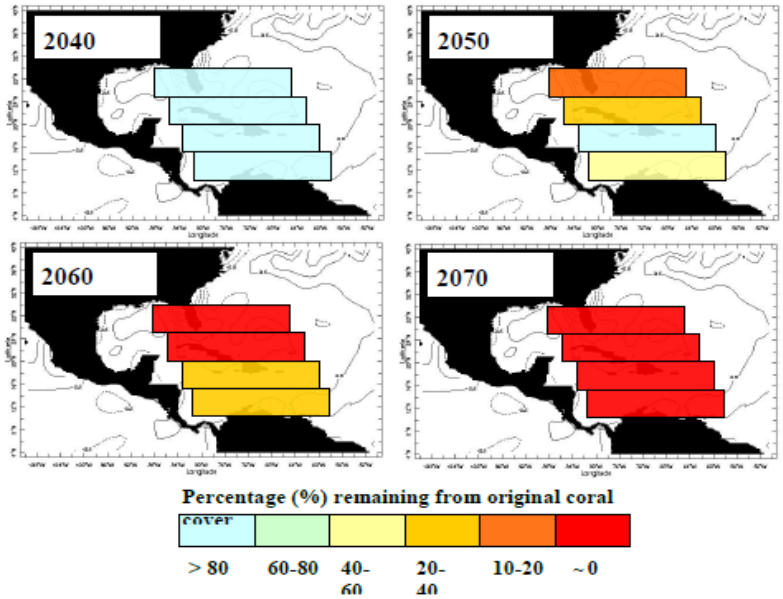


Source: P. J. Mumby, *et al.*, Marine Spatial Ecology Laboratory at the University of Exeter (UK)

10. A recent analysis indicates that high sea surface temperature anomalies will have significant impacts on the coral reefs in the Caribbean especially if no significant large-scale adaptation measures are undertaken.[9] Figure 2 summarizes the results of this analysis that simulates the response of coral reefs in the Caribbean to continuous increases in sea surface temperature (SST), as anticipated under the A1B emission trajectory of the Inter-governmental Panel on Climate Change (IPCC). Optimal water temperatures for Caribbean corals range from 25 to 29° C, with a few important exceptions. A few individual corals of many species are able to tolerate higher temperatures for a few days or weeks, depending on the magnitude of the temperature elevation. There is strong evidence that corals have the ability to adapt to higher temperatures if given enough time and removed from other types of chronic stress (e.g., over-fishing, pollution, rapid coastal development, etc). Therefore, adaptation measures for coral reefs must include broader management measures such as controlling overfishing and associated ecological imbalances through the establishment of no-take marine reserves, as well as controlling land-based threats to reefs.

[9] Vergara et al., "The Potential Consequences of Climate-induced Coral Loss in the Caribbean by 2050-2080", *Assessing the Potential Consequences of Climate Destabilization in America*, LCR Sustainable Development Working Paper No. 32, World Bank, January 2009.

Figure 2. Evolution of relative coral covers over time for the four different latitudes under the A1B scenario with 2ºC temperature sensitivity



Source: Vergara, W. *et al*, 2009. Subjacent map obtained from www.portal.iri.columbia.edu.

11. The anticipated intensification and an increase in the frequency of hurricanes threaten the survival of coral reefs. The increase in major hurricanes is indicative of a broader increase in average tropical cyclone wind speeds as sea surface temperature rises, as well as a shift in the intensity distribution toward a greater number of Category 4 and 5 hurricanes. An analysis of the global tropical cyclone intensity data since 1970 indicates an average increase in intensity of 6 percent for a 0.6°C SST increase. High-resolution climate models indicate a 2 percent intensity increase when scaled for a 0.6°C SST increase, and potential intensity theory yields an increase between 2.7 percent and 5.3 percent.[10]

12. Hurricane events lead to disturbance and mortality of coral recruits by sediment scouring, direct mechanical breakage, and the removal of substratum. Post-hurricane events such as an ephemeral bloom of blue-green and filamentous green algae may also create further stress.[11] Hurricanes cause a devastating reduction in live coral cover when it coincides with a bleaching event. An observation reported that a mass-bleaching event coinciding with hurricane Mitch in 1998 resulted in a 48 percent reduction in live coral cover across the Belize reef system. The corals showed signs of recovery in 1999 in fore-reef habitats of the outer barrier reef and offshore platforms. In contrast, coral populations on reefs in the central shelf lagoon died off catastrophically[12].

[10] J. Curry *et al*., "Potential Economic Impacts of Hurricanes in Mexico, Central America, and the Caribbean ca. 2020–2025", *Assessing the Potential Consequences of in America*, LCR Sustainable Development Working Paper No. 32, World Bank, January 2009.
[11] Mumby, P. J., "Bleaching and hurricane disturbances to populations of coral recruits in Belize", *Marine Ecology Progress Series*, Vol. 190, 27-35, December 1999.
[12] Aronson, R.B. *et al*., "The 1998 bleaching event and its aftermath on a coral reef in Belize", *Marine Biology* (2002) 141: 435–447, DOI 10.1007/s00227-002-0842-5

Table 1. Value of annual losses of economic services of coral reefs (Lecon),
in 2008 US$ million

	50% Corals in Caribbean are lost		90% Corals in Caribbean are lost	
	Low estimates	**High estimates**	**Low estimates**	**High estimates**
Coastal protection	438	1,376	788	2,476
Tourism	541	1,313	973	2,363
Fisheries	195	319	351	574
Pharmaceutical uses	3,651	3,651	6,571	6,571
Total	4,824	6,659	8,674	11,985

Source: Vergara et al, 2009, op.cit.

13. Further reduction in the reef cover would weaken its ability to provide the associated local and global economic and environmental services. Specifically, in the wake of coral collapse, major impacts on fisheries, tourism, and coastal protection are anticipated, as well as severe loss of biodiversity in terms of species extinction and impacts on ecosystem integrity. Once the corals die, the reef structure breaks down with no easy way to regain the ecological goods and services of habitat, fisheries, tourism and storm protection.[13] The economic losses associated to 90 percent coral collapse in the Caribbean have been estimated at between 9 and 12 billion dollars per year (Vergara et al., 2009).

14. Warmer sea water threatens the coral reefs that attract thousands of tourists for snorkeling and scuba-diving activities. Loss in the percentage of coral cover with a concomitant loss in reef-related species of invertebrates and fishes will lead to a general decline in the attractiveness of reef sites used for snorkeling and scuba diving. Presently, the majority of tourism in Belize is marine-based, with approximately 70% of hotels located in the coastal zone. Over 60% of visitors are interested in visiting the cayes. Tourism accounts for over 15% of GDP, is the largest source of foreign exchange earnings, and generates significant employment. The economic impact of climate change on Belize's tourism sector has been estimated at BZ$48.3 million, which includes the effects of reduced tourism demand and the loss of facilities (from sea level rise), beaches (from coastal erosion) and reef-based ecotourism. Thus, any decline in marine tourism will have a direct effect on the economy of the country. With a loss in coral cover there will also be a related loss in biodiversity. Coral reefs are one of the most diverse systems on earth, and the reefs of Belize comprise some of the best in terms of general reef health and diversity in the Caribbean region.

15. Belize's location and vulnerability to climate change, one effective way of adapting to climate change is through promotion of ecosystem-based adaptation measures that strengthen the resilience of the reef and associated habitats. An effective approach to protect corals is by strengthening and improving the overall health of the ecosystems associated with the coral reef. A recent study shows that bleached corals recover to normal growth rates more quickly when they have clean water and plentiful sea life at their side. The researchers found that following a major bleaching event Mountainous star coral (*Montastraea faveolata*) on various reefs in Honduras and Belize was able to recover and grow normally within two to three years when the surrounding

[13] Hoegh-Guldberg *et al.*, "Coral Reefs under Rapid Climate Change and Ocean Acidification", Science 14 December 2007: 1737-1742.

waters and reef were relatively healthy. In comparison, those corals living with excessive local impacts, such as pollution, were not able to fully recover after eight years[14].

Belize's debt challenge

16. Notwithstanding the potentially enormous economic and environmental losses associated with climate-induced damage to coral reefs, countries like Belize are ill-equipped to provide the resources required to implement urgent adaptation and conservation measures to increase the climate resilience of the reef. Part of the difficulty derives from the precarious fiscal situation in the country, including a high indebtedness that prevents investments in long-term challenges, including adaptation to climate change consequences.

17. Belize's political system is stable, but the country has experienced a sharp increase in debt and ensuing economic crisis in the 1990s to 2008. A successful debt restructuring in 2007 helped avert an imminent financing shortfall. The Government restructured US$550 million of commercial debt (out of a total public external debt stock of US$1 billion) into a "superbond" that will be amortized over a period of ten years starting in 2019. The remaining balance (approximately US$387 million) includes bilateral and multilateral debt obligations. The bilateral debt is mostly held by the Governments of Taiwan (China) (US$137 million), Venezuela (US$19.4 million), Kuwait (US$8.4 million). These three countries represent 97 percent of the bilateral public debt outstanding as of end March 2011.

18. Though the debt restructuring improved short-term debt dynamics, a 2010 IMF debt sustainability analysis (DSA) suggests that, without further fiscal consolidation, public sector debt will remain high at around 80 percent of GDP over the medium term, due to weak fiscal performance and slow growth. In addition, Belize remains at high risk of debt distress as the public debt burden remains vulnerable to negative shocks in the fiscal accounts, economic growth and in particular the exchange rate, since 90 percent of public debt is denominated in foreign currency.

19. Indeed, even after the 2007 debt restructuring, Belize has been servicing a large public external debt to multilateral, bilateral and private debt holders. According to the Government budget presentation for FY2011/12 (April to March), interest payments accounted for 15.7% of total revenues in FY2010/11. As a consequence, other important development priorities have been underfunded. Currently, Belize has limited capacity to adapt to exposure to the impacts of climate change largely because of the high levels of public debt, which severely limit the available resources to finance adaptation.

20. The current structure of climate financing favors poor countries or those with a large carbon footprint. This typology excludes a large number of nations, like Belize, with high debt, middle-income, large climate vulnerabilities, and modest carbon footprints. A mechanism as the one herewith proposed, has the potential to open a third way for financing of adaptation and could also be used as leverage to raise resources for adaptation from non-conventional sources. Specifically for Belize, this transaction would improve the conditions for the country's economic development through improved fiscal sustainability and create a significant national source of funding to address issues of sustainable management, climate resilience, and adaptation for its barrier reef, and thus secure better conditions for the economic services it provides. Also, the proposed mechanism could offer an innovative alternative financing tool for adaptation issues in other highly indebted nations

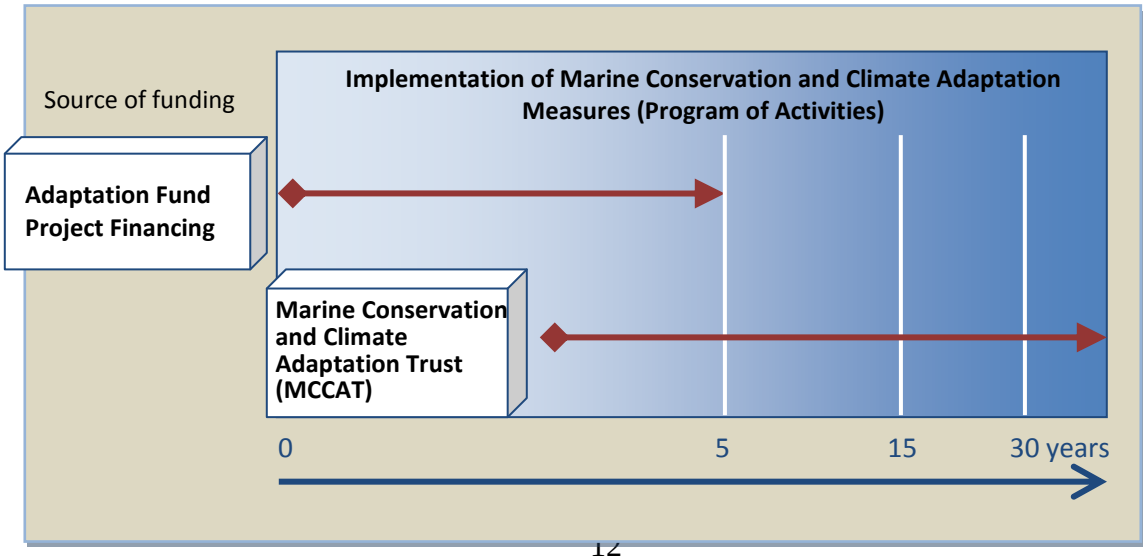
[14] Carilli JE, Norris RD, Black BA, Walsh SM, McField M (2009) Local Stressors Reduce Coral Resilience to Bleaching. PLoS ONE 4(7): e6324. doi:10.1371/journal.pone.0006324

that are grappling with similar issues. The proposed transaction is similar in structure to past *Debt-for-Nature Swaps*, but would be the first of its kind to explicitly target marine climate adaptation and resilience efforts.

PROJECT / PROGRAMME OBJECTIVES:

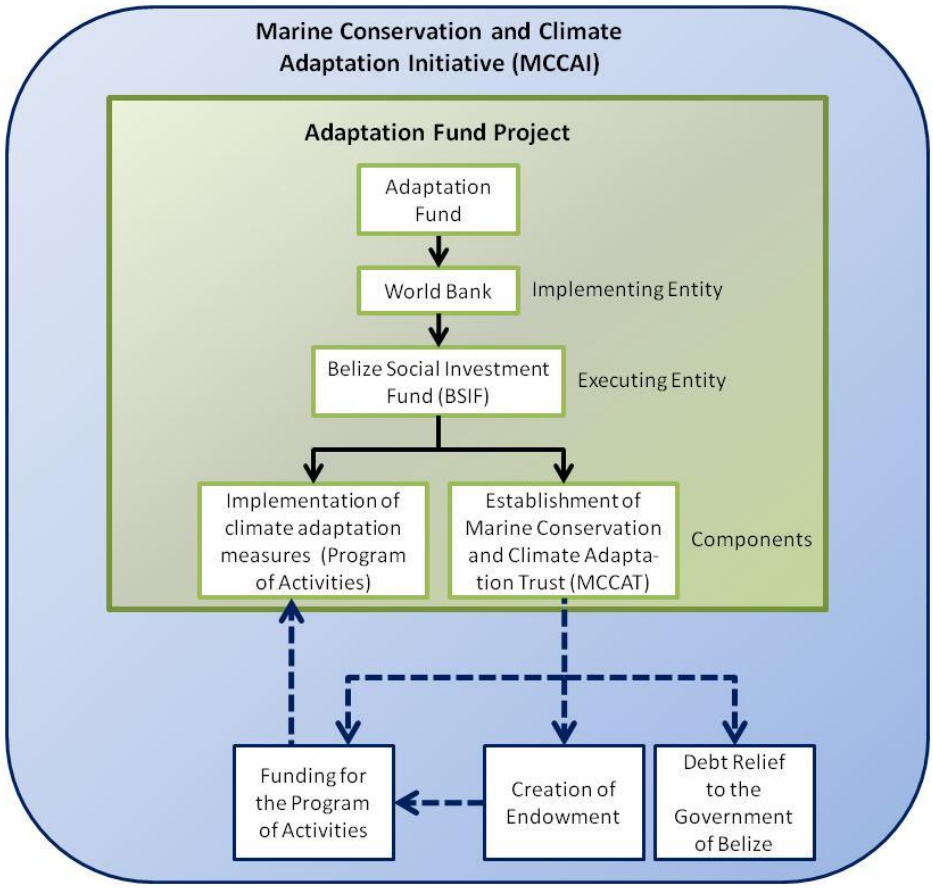
21. The objective of the proposed Adaptation Fund Project is **to catalyze the Marine Conservation and Climate Adaptation Initiative (MCCAI) in order to provide a long-term mechanism to strengthen the climate resilience of the Belize Barrier Reef System**. The MCCAI is an ambitious and innovative program aimed at (i) implementing measures at scale to achieve climate resilience in a critical ecosystem, (ii) securing sustainable financing for these activities into the future, and, (iii) helping address Belize's constrained fiscal space. It is ambitious in terms of the scale of financing and targets on the ground addressing climate change and fiscal challenges facing Belize. The innovation of MCCAI is that it con-jointly addresses the climate change and fiscal challenges facing Belize, while at the same time setting up a sustainable financing mechanism to support crucial on-the-ground investments in adaptation measures (see Figure 4). The Adaptation Fund Project plays a crucial, catalytic part of the MCCAI by (i) financing the initial climate adaptation measures during first five years, and (ii) setting up the Marine Conservation and Climate Adaptation Trust (MCCAT) which would continue to finance the Initiative beyond the first five years into perpetuity (see Figure 3). The Trust would be capitalized to a target figure of US $100 million using resources from bilateral, NGOs, and private partners. The Adaptation Fund resources would not be used to capitalize the Trust but would allocate a nominal amount (US $0.4 million) to establishing the Trust into which other partners would contribute resources for financing climate action into the future. The bulk (96%) of the Adaptation Fund resources (US $9.6 million inclusive of execution cost and fees) would go to financing direct on-the-ground adaptation measures. Once the MCCAT becomes operational, the full Program of Activities would be financed with the funds generated by the MCCAT which is capitalized with various sources of funding. The funding received by the Trust would be used to purchase a portion of Belize's external debt in order to redirect financial resources that are currently used to service debt, towards significant in-country investment for a program of specific climate adaptation and conservation measures to increase the resilience of the Belize Barrier Reef and associated ecosystems (See Part II).

Figure 3: Marine Conservation and Climate Adaptation Initiative (MCCAI) Time Horizon of Implementation



22. The concept behind the creation of the Trust embodies a two-track approach which combines **ecosystem-based adaptation** with national level enabling policy, finance, and legal frameworks as an effective long-term approach to help strengthen the resilience of the reef system to the adverse effects of climate change. Indeed, reef scientists recommend not only a stabilization of CO_2 and other greenhouse gas concentrations, but also a slight reduction from the current level of 388 ppm (2010) to 350 ppm, if large-scale degradation of reefs is to be avoided. Attaining this challenging target will take time, and require immense global efforts. In the meantime the best approach to adapt to climate change requires ecosystem-based approaches that strategically plan to enhance local-scale reef resilience through targeting critical areas, building networks of protected areas that include (and replicate) different parts of the reef system, as well as include areas critical for future reef replenishment. Such efforts may represent an opportunity to "buy time" for reefs, until global greenhouse gas emissions can be curbed. Thus this Initiative would produce long-term economic, environmental, and social benefits by addressing the challenges posed by climate change on marine ecosystems and on the livelihoods of current and future generations in Belize.

Figure 4: Funds Flow of Adaptation Fund Project within the Marine Conservation and Climate Adaptation Initiative (MCCAI)



PROJECT / PROGRAMME COMPONENTS AND FINANCING (TABLE 2):

PROJECT COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES	AMOUNT (US$)
1. Implementation of initial marine conservation and climate adaptation measures	1. Expansion and Securing of Marine Protected Areas and Replenishment (No-Take) Zones 2. Improving the reef's policy and regulatory protection regime 3. Scaling up the pilot repopulation of coral reefs with thermally resilient varieties grown in coral nurseries 4. Providing comprehensive support for viable and sustainable alternative livelihoods for affected users of the reef 5. Raising awareness, building local capacity, and disseminating information	Resilience of the reef and marine ecosystems strengthened	7.87 million
2. Establishment and capitalization of a sustainable financing mechanism for marine conservation and climate adaptation	Marine Conservation and Climate Adaptation Trust (MCCAT) established with governance and operational procedures in place	MCCAT operationalized and capitalized from various sources of funding	0.4 million
3. Project/Programme Execution cost			0.95 million
4. Total Project/Programme Cost			9.22 million
5. Project Cycle Management Fee charged by the Implementing Entity			0.78 million
Amount of Financing Requested			10 million

PROJECTED CALENDAR (TABLE 3):

MILESTONES	EXPECTED DATES
Start of Project/Programme Implementation	January 2012
Mid-term Review (if planned)	June 2014
Project/Programme Closing	January 2017
Terminal Evaluation	June 2017

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

Component 1 – Implementation of initial marine conservation and climate adaptation measures (US $7.8 million requested from the AF; total cost US $21 million)

23. The objective of this component is **to implement the initial priority set of climate adaptation and conservation measures to improve the overall health of the reef ecosystem in order to increase the climate resilience of coral reefs**. These activities would be scaled up (into a Program of Activities) once the MCCAT financing mechanism is fully operational. The activities will be carefully selected based on the concept that the best chance of enhancing the resilience (resistance and recovery potential) of natural systems to climate change impacts is to reduce local stressors which undermine the innate resilience to external shocks that is characteristic of healthy, robust ecosystems and to strengthen the coral reefs thermal resilience.

24. While there has previously been heavy emphasis on engineering approaches (e.g., dikes, storm shelters, building codes and storm resistant houses, drainage canals, sea walls, etc) to adapting to climate change related hazards (such as hurricanes and storms), empirical evidence is showing that the importance of natural ecosystem buffers and their role in climate change adaptation may indeed be higher than thought. Investing in measures that protect and improve the ecological health of the natural ecosystems (such as the Belize Barrier Reef) is the best way to anticipate climate change while enhancing resilience to climate change impacts. Such ecosystem-based adaptation measures have little or no risk of mal-adaptation (e.g., dikes that encourage settlement in highly vulnerable areas) and may in fact be more cost effective. For example, a very rigorous data-rich analysis by Saudamini Das (2007)[15] sought to answer 3 key questions: (a) do mangroves provide storm protection?; (b) how do they fare vis-à-vis the other approaches like early warning, storm shelters, dikes, sea walls, etc?; and, (c) is mangrove preservation an economically viable adaptation strategy to climate change? The analysis empirically established that mangroves were highly effective in reducing casualties during the 1999 Super Cyclone in Orissa - India, whether of humans, buffaloes or cattle. Indeed mangrove conservation was found to be effective against the wind and wave surges during climate-related hazards which are frequent in the area. Specifically, the analysis found that: (i) mangroves reduced human death, livestock loss and house damages during the T-7 Super Cyclone of October 1999; (ii) human death toll would have been nearly doubled in the absence of mangroves; and, (iii) annualized storm protection benefit of mangroves for reducing the damages was found to be higher than annual return from land hence justifying mangrove conservation as a viable adaptation strategy to climate change. In the proposed Project intervention area in Belize, the Barrier Reef shelters the coastal zones from intense tropical storms and high velocity winds that cause erosion and coastal damage. Furthermore, it has been estimated that the value of ecosystem services (fishing, tourism, storm and shoreline protection) generated by the coral reefs and mangroves contributes between 15 and 22 percent of GDP in Belize. This shows that investing in measures that protect marine ecosystems such as mangroves

[15] Saudamini Das (2007) Storm Protection by Mangroves in Orissa: An Analysis of the 1999 Super Cyclone. South Asian Network of Development and Environmental Economics. Paper # 25-07.

and coral reefs is indeed a viable and cost-effective adaptation strategy in the face of limited resources and increasing climate change impacts.

25. In addition to the adaptation benefits, there are direct co-benefits associated with ecosystem-based adaptation measures with regard to GHGs emissions (i.e., climate change mitigation). While further work is needed to identify the magnitude of emissions from near-shore marine ecosystems such as seagrass beds, it is clear that improved management of these ecosystems would slow or reverse current loss of carbon sequestration capacity[16]. Natural coastal habitats (marshes, mangroves, seagrasses, etc) sequester and store large quantities of carbon in plants and the soils below them - termed "Blue Carbon". Currently, greenhouse gas emissions that occur as a result of the management of such coastal and marine habitats are not being accounted for in international climate change mechanisms (e.g., UNFCCC, Kyoto, CDM, etc) or in National Inventory Submissions. This represents a missed opportunity globally and for those countries like Belize that are richly endowed with coastal and marine ecosystems of global importance. Over the past couple of years, scientific work has documented the carbon management potential of a number of coastal ecosystems: tidal saltmarshes, mangroves, seagrass meadows, kelp forests and coral reefs. The evidence shows that the carbon management potential of these selected marine ecosystems compares favorably with and, in some respects, may exceed the potential of carbon sinks on land. This potential can be effectively maintained and enhanced through management approaches such as marine protected areas, marine spatial planning, area-based fisheries management approaches, regulated coastal development, and ecosystem rehabilitation. Sustainable management of coastal wetlands and near-shore marine ecosystems offer a wide range of co-benefits, including shoreline protection, nutrient cycling, water quality maintenance, flood control, habitat for birds, other wildlife and harvestable resources such as fish. Together, these increase the resilience of coupled ecological and social systems to the impacts of climate change. Indeed, there are calls to identify conservation and management actions for coastal wetlands and near-shore marine ecosystems as components of developing countries' Nationally Appropriate Mitigation Actions (NAMAs).

26. The adaptation measures to be implemented would complement on-going efforts by the Government of Belize and other funding sources aimed at marine protected areas (MPAs). While the on-going measures have been crucial in protecting this critical ecosystem, they have been lacking in programmatically mainstreaming specific climate adaptation into their activities. Therefore, this Project would specifically **mainstream climate change adaptation into the on-going activities** (e.g., tourism master plan under development, etc). In line with the core principles of country-drivenness and country ownership, the proposed activities would specifically address the key adaptation measures identified in Belize's First National Communication to the UNFCCC. (See Section D). In particular the First National Communication identifies enforcement of conservation and use of marine and terrestrial ecosystems, establishment and management of protected areas, inclusion of biodiversity conservation into sectoral adaptation strategies, creation of alternative livelihoods away from coastal systems, as some of the climate adaptation measures that need to be urgently undertaken. The design and implementation of these activities is meant to enhance climate resilience and also address the anthropogenic stressors (specifically overfishing, uncontrolled

[16] Crooks, S.; Herr, D.; Tamelander, J.; Laffoley, D.; and Vandever, J. (2011): Mitigating Climate Change through Restoration and Management of Coastal Wetlands and Near-shore Marine Ecosystems. *Challenges and Opportunities.* The World Bank. Environment Department Papers. #121

coastal development and marine dredging, unsustainable tourism practices on the reef, etc) impacting the reef ecosystem.

27. Consequently, the following five priority activities are proposed to be implemented under this component (see additional details in Annex 2):

Sub-component 1.1 – Expansion and Securing of Marine Protected Areas and Replenishment (No-Take) Zones

28. This activity would support the GoB in the expansion and enhanced enforcement of marine protected areas and replenishment (no-take) zones, which are critical to reduce anthropogenic stressors and, in turn, enhance ecosystem functionality, resilience, and capacity to adapt to climate induced changes. The protected zones would cover identified fish spawning sites, resilient coral reef sites that have survived/recovered from the bleaching events, and climate refugia to ensure the reef's capacity to recover from extreme climate events by providing a sufficiently large and resilient seed stock of critical biodiversity and sustain productivity in the long-term. One of the key local stressors is over-fishing especially of big fish and sharks which reduces fish populations and disrupts food webs on the reef. The most valuable catch for the fishers is the spiny lobster (*Panulirus argus*) which is also important for the health of corals because it preys on coral predators such as snails and fire-worms. Expanding the No-Take Zones and MPAs would immediately have the impact of reducing the fishing pressure and hence allowing the reef ecosystem to maintain and strengthen its health. Elevated summer temperatures have been shown to strengthen coral pathogens while weakening the coral host, with optimum water temperatures for infectious agents being higher than the optimal temperatures for corals. Recent increases in the frequency and virulence of disease outbreaks on coral reefs suggest that the trend of increasing disease will continue to strengthen as global temperatures increase. Coral disease is an important aspect of climate change for coral reefs, and disease resistance in corals is an important aspect of adaptation, allowing adapted coral genotypes to survive over time. Overfished reefs tend to have overabundant *Stegastes* populations, and associated high disease rates. No-take areas tend to have fewer of these disease-spreading fish, likely because of greater abundance of *Stegastes* predators (e.g., groupers). This is yet another example of how no-take MPAs help coral reefs survive warmer waters and adapt to climate change. Lowering coral predator (e.g., coral eating fire-worm and snails) abundance should be possible through the establishment of no-take zones on reefs, which would then have higher levels of snail and fire worm predators (lobsters and triggerfish). Hence, the establishment of no-take marine protected areas, as it results in better ecological balance, is considered an important climate change adaptation measure for coral reefs.

Sub-component 1.2 – Improving the reef's policy and regulatory protection regime

29. The activity is aimed at programmatically mainstreaming specific climate change adaptation measures through the on-going efforts by the GoB in (a) strengthening the legal framework for Marine Protected Areas, (b) formalizing a legal framework for co-management agreements of National Protected Areas (NPAs), and (c) addressing other core policy and legislation objectives identified in Annex 3. These efforts are crucial to reducing key local stressors to the reef such as: (a) unplanned coastal development and marine dredging which cause nutrient, sediment and other pollution, and also lead to loss of critical nursery habitats (especially mangroves and seagrass); and, (b) uncontrolled tourism expansion (cruise-ship industry) and associated unsustainable practices, pollution and pressures on the reef. By strengthening the policy and regulatory regime, this component enhances the protection and sustainable management of the reef. This activity would be led by the Ministry of Natural Resources and the Environment (MNRE) and the Ministry of Agriculture and Fisheries in cooperation with the local and international NGOs (e.g., The Nature

Conservancy, Oak Foundation, Belize Audubon Society, World Wildlife Fund, Southern Environmental Association, etc). Consultations with senior Government officials have yielded a broad agreement that includes the goals outlined in this section. A policy letter issued by the MNRE, pledging to implement the regulatory and policy actions in support of Sub-components 1 and 2 is included in Annex 1 b.

Sub-component 1.3 – Scaling up the pilot repopulation of coral reefs with thermally resilient varieties grown in coral nurseries

30. The activity would support coral restoration activities that will accelerate natural recovery from and adaptation of reef coral populations to the increasing sea surface temperature, frequent bleaching events, and intensified extreme weather events through repopulation of coral reefs with resilient varieties grown in the coral nurseries. The activity would establish coral nurseries throughout the Belize barrier reef system and on each of the three atolls. Multiple nurseries need to be established in each section of the reef to represent the 'ecotypes' there and for greater probability of survival against bleaching events, storms or disease outbreaks. Selection of mother corals for propagation would be based on past bleaching history and mapping work (Carne 2010). The focus of the efforts would be on the *Acroporids* due to their fast growth rate, importance for reef structure and critically endangered status (2006) but nurseries would include additional stony coral species like *Agaricia tenuifolia, Dendrogyra cylindrus, Montastrea spp.* and brain corals. Heat resilient corals grown in the nurseries would be out-planted into selected areas to increase natural sexual reproduction and restoration of the reef structure. Material used for repopulation would be representative, to the extent possible of original population diversity- based on Baums' work at Gladden (2007) that revealed relatively high diversity for *Acropora palmata* and densities. Most of the repopulation effort would be undertaken on reefs that can provide an upstream source of larvae, and/or have significant tourism and fisheries value and whenever possible, are located in protected areas. This activity would be led by the local marine biologists who have pioneered the coral pilot in Belize.

Sub-component 1.4 – Providing comprehensive support for viable and sustainable alternative livelihoods for affected users of the reef

31. The activity is aimed at ensuring economically viable and sustainable alternative livelihoods for local populations whose economic activities are dependent on marine resources which are impacted by the adverse effects of climate change as well as by the expansion of the no-take and MPA network. By working with the affected communities for their livelihoods, the Project would reduce the anthropogenic stressors on the marine resources and, in turn, increase the health of reefs and associated marine and coastal ecosystems. The number of those affected includes at least 1,600 fishermen, those who engage in tourism, including private sector, and indirectly many of the 203,000 people living in the coastal areas of Belize. The GoB has placed very high priority on supporting measures that would provide viable livelihood opportunities for those communities that are heavily reliant on reef areas that would be targeted for enhanced protection. This activity would specifically support (a) creating jobs, (b) targeted training, and (c) provision of financial resources for initial capital investment in viable options targeted at the impacted populations. This activity would be implemented in partnership with local communities, indigenous communities, private sector players including small and medium enterprises (SMEs), micro-lending institutions, NGOs, Government of Belize, and multi-lateral and bilateral donors. The design and implementation of these activities will ensure and strengthen gender considerations and the participation of civil-society organizations. During the design of the Project, a social assessment would be undertaken in order to determine specific activities and target communities to be supported. Project activities

would consider the impacts of climate change on men versus women in coastal communities since a large number of the households earn a living from fishing, hence the degradation of the reef/coastal areas and fishstock is likely to have differentiated gender impacts on men and women and their households. The bottom line is that in the tourism industry and coastal fishing communities gender roles could be different, and hence the impact of climate change on them as well as their adaptation/response strategy is bound to differ; thus it is important to have targeted livelihood options that enhance socio-economic resilience to climate change. Because men and women might be affected in various ways due to their varying exposure and engagement in coastal and reef based fisheries and tourism, the definition of success in climate change adaptation in terms of human development indicators would take this gender diversity into account and come up with specific monitorable outcomes in the Project Results Framework. Non-governmental and community-based organizations will be involved in assisting the communities in the targeted areas to carry out activities aimed at enhancing their climate resilience. These would include activities related to improving livelihoods, such as building the climate resilience of aquaculture, agriculture, and tourism, empowering local communities by building their capacity to assess their own needs, training for tour guides and scuba diving, seaweed farming and processing, etc.

Sub-component 1.5 – Raising awareness, building local capacity, and disseminating information

32. The activity aims to (a) increase the understanding by local stakeholders of the value of marine conservation and impacts of climate change and build support among stakeholders of the importance of the National Protected Areas Policy and System Plan (NAPSP) to the long term sustainability of natural resources; b) build local capacity to support/participate in the program activities; and c) support knowledge sharing and exchange activities to promote learning and cooperation between the program and the global marine conservation and climate adaptation community. A climate change knowledge, attitude and behavioral practice (KAP) survey would be conducted to identify needs and understand gaps in the knowledge, attitudes and behavioral practices of Belizeans (especially in coastal communities), with respect to climate change. The results of the KAP survey will be used in the design of targeted climate change knowledge and awareness raising program and a communications strategy to improve the knowledge, attitudes, and practices of targeted coastal communities, thereby increasing capacity for climate change resilient communities and economy.

Component 2 – Establishment and capitalization of a sustainable financing mechanism for marine conservation and climate adaptation (Target capital of US$100 million, Operational costs: US$0.4 million requested from the Adaptation Fund)

33. The objective of this component is to establish a sustainable financing mechanism for climate adaptation measures for the Belize Barrier Reef System and associated marine and coastal ecosystems through the establishment and capitalization of the Marine Conservation and Climate Adaptation Trust (MCCAT). Creation of a trust fund is an effective way to support adaptation measures in the long-term for a country like Belize which is highly indebted and has little fiscal space to invest in climate adaptation actions in the country. The Trust would be capitalized to a target figure of US $100 million using resources from bilateral, NGOs, and private partners. The Adaptation Fund resources would not be used to capitalize the Trust but would allocate a nominal amount (US $0.4 million) to establishing the Trust into which other partners would contribute resources for financing climate action into the future. The innovativeness of the MCCAT is that it offers predictable and sustainable financing for climate change adaptation actions targeting Belize's

critical but vulnerable coastal and marine resources for the foreseeable future. Predictability and sustainability of financing for climate action is a key issue that the international community is grappling with; by raising resources from non-conventional sources, MCCAT offers an innovative alternative financing tool for adaptation in other highly indebted countries faced with similar issues. In addition, the MCCAT would have a unique strategy to redirect financial resources that are currently used to service Belize's external debt towards significant in-country investment for a program of specific adaptation measures to increase the climate resilience of the reef and associated marine and coastal ecosystems. Future adaptation measures to be financed by the MCCAT will adhere to the Trust's objectives with a specific focus defined in multi-year strategies and the selection criteria and procedures set forth in its Operational Policies and Guidelines that will be prepared during the next phase of project preparation.

34. The establishment and operationalization of the MCCAT would include:

(a) Incorporation of the MCCAT as an off-shore independent legal entity,
(b) Development of bylaws and Operational Policies and Guidelines for the MCCAT, and
(c) Establishment of the Board of Governors, the Program Administration Unit (PAU)[17], and Technical Advisory Committee.

35. The establishment and operationalization of the MCCAT and achieving its charitable non-profit status is relatively quick and planned to be supported by the Adaptation Fund (within approximately 6 months of the signing of the Adaptation Fund Grant). The Trust would be established and made fully operational by developing bylaws and the Operational Policies and Guidelines, designing the investment strategy, assembling its Board of Governors and the Technical Advisory Committee, recruiting PAU staff, adopting a multi-year strategy, designing requests for proposals (RFP), as well as establishing policies and procedures for (1) receiving proposals, (2) reviewing proposals, (3) making grant decisions, (4) disbursing funds, and (5) exercising monitoring and evaluation processes.

36. The MCCAT would be governed by a representative Board of Governors, which would adopt a multi-year strategy for addressing marine climate resilience and adaptation and approve annual work-plans based on the multi-year strategy. The MCCAT would have a Belize-based Program Administration Unit (PAU) to assume key operational functions including: (a) fund management; (b) development of annual work plans; (c) management and supervision of the program of activities; (d) procurement, disbursement, and financial management; and (e) monitoring and evaluation. The technical aspects of the MCCAT as well as selection of proposals for program funding would be overseen by Technical Advisory Committee. (See Part III)

37. In parallel to the operationalization of the Trust, fundraising for the endowment continues. The MCCAT endowment would be capitalized by different sources of funding including bilateral and private donors and NGOs. The target capital level of the Trust would be US$100 million to guarantee adequate long term funding for conservation and climate adaptation activities, as well as to provide meaningful debt relief to Belize. The Initiative is targeting to raise US$ 100 million and based on very early consultations, a number of parties have already expressed interest in the concept and some have pledged resources. Potential sources of capital include the OAK Foundation ($10 million already pledged), the Summit Foundation US $5 million already pledged), and the

[17] The project would consider an existing national foundation as a potential candidate to fulfill the role of PAU.

Government of Germany ($10 million proposal under advanced review process). This indicates that once the Trust is established, there is high confidence that it would be fully capitalized to US $100 million.

B. Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities.

38. The following paragraphs describe the economic, environmental, and social benefits that would result from the implementation of the program of activities under the Project. The Project, is designed to target the most vulnerable communities that depend on the use of the marine ecosystem services. These include subsistence fishermen, indigenous groups, tourism service employees and other artisans and local service providers.

39. **The value of ecosystem services generated by the coral reefs and mangroves contributes between 15 and 22 percent of GDP in Belize.** WRI conducted a valuation study of the coastal capital in Belize (2008) to assess the economic contribution of three services provided by reef and mangrove ecosystems: (i) fishing, (ii) tourism, and (iii) shoreline protection. The value of coastal tourism was calculated by estimating gross tourism expenditures in coastal areas (marine recreation, accommodation and food, and other spending). The shoreline protection services total between US$231 and US$347 million, or 9 to 13.5 percent of GDP, in avoided damages per year by buffering against storm surge and reducing erosion.[18] Of this amount, mangroves contribute US$111–167 million and coral reefs contribute a further US$120–180 million. Economic benefits (described in more detail below) from fishing add another US$14–16 million. In total, the value of the coastal ecosystem—coral reefs and mangroves—was in the range of US$395–559 million per year, or 15 to 22 percent of Belize's 2007 GDP

Environmental benefits

40. The proposed coral adaptation activities would promote repopulation of Elkhorn coral (*Acropora palmata*) and Staghorn coral (*Acropora cervicornis*) and other species to increase the resilience of reef systems and contribute to long-term sustainability of the coral biome. The named two species were recently listed by IUCN as critically threatened with extinction, the first reef building corals on the planet to be formally recognized as such. Until recently, *Acropora* corals dominated reefs and were the most abundant coral species on most Caribbean reefs. Because these species are the only large, open-branched corals in the Caribbean, they provide critical habitat for fish and other species like lobsters. Besides *Acropora*, other rare species such as Finger coral *Porites*, Pillar coral (*Dendrogyra cylindricus*), and Star corals (*Montastrea annularis* and *M. faveolata*) would also be targeted.

41. The proposed Project would generate positive impacts on the rich flora and fauna of Belize by improving the management of marine ecosystems and habitats of the Belize Barrier Reef System, from oceanic atolls outside the Barrier Reef, to extensive lagoonal and estuarine systems in the near-shore area. The expansion of MPAs and no-take replenishment zones would promote the reproduction of commercially important overexploited marine species such as the Nassau grouper

[18] This is an upper bound on the damage estimates that would be incurred in coastal areas in the absence of mangroves and coral reefs, and further analysis of scenarios of gradual degradation of reef and mangrove ecosystems are needed to provide the lower- and mid-range estimates of the value of shoreline protection services.

(*Epinephelus striatus*), the Red Snapper (*Lutjanus campechanus*), the Silk Snapper (*Lutjanus synagris*), the Caribbean spiny lobster (*Panulirus argus*), the Queen Conch (*Strombus gigas*), and other species. Also, many endemic species like the West Indian Manatee (*Trichechus manatus*) and the American Saltwater Crocodile (*Crocodylus acutus*) would benefit from the habitat conservation measures under the proposed Project.

42. This ambitious Project would also allow Belize to meet its commitments under the Convention on Biological Diversity and the goals set under the Belize National Protected Areas System Plan. This means meeting protection targets for all marine ecosystems within the Belize Barrier Reef and providing stewardship for approximately 13% of highly valued coral reef ecosystems. It also provides an opportunity to expand this representation by a targeted 30% of each ecosystem type thus significantly increasing the protection and management of this crucial ecosystem.[19]

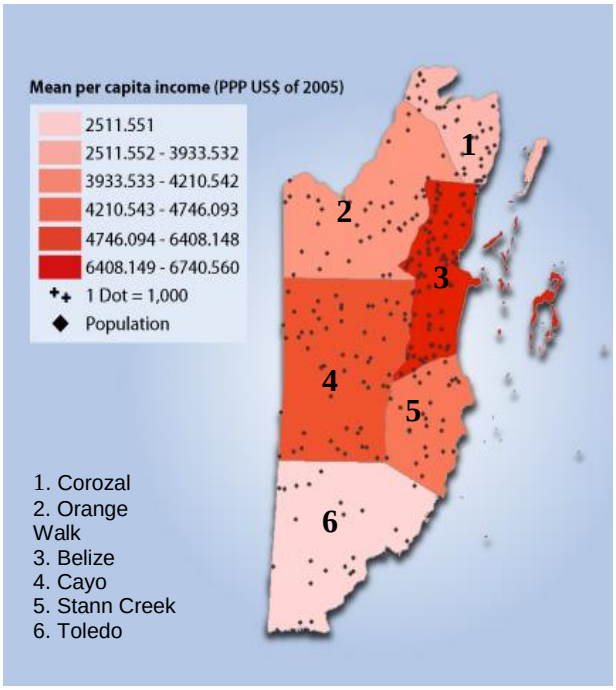
Social Benefits

43. The proposed adaptation, conservation, and restoration activities of the Belize Barrier Reef System are of immense socio-economic significance, providing an opportunity for maintaining and potentially increasing the income level and marine resources available for an estimated 203,000 people living in the coastal areas of Belize. According to the National Poverty Assessment of 2010, about 43 percent of the population (approximately 114,000 people) remains below the poverty line. The poor populations are concentrated in the Toledo and Corozal districts (see Figure 5).

44. Belize is a multi-racial society with ethnic groups heavily intermixed. The major ethnic groups are the Mestizos in Corozal, the Creole in the Belize district, the Mayas in Toledo, and the Garifuna in Stann Creek.[20]

45. Fishing has traditionally been a means of subsistence in coastal communities and has been the main source of protein. However, it has been transformed into a commercial activity over the years and as a result has affected the availability of fish for local consumption as an inexpensive source of protein.

Figure 5. Per Capita Income and Population in Belize



Source: Reshaping Economic Geography in Latin America and the Caribbean, World Bank, 2009.

[19] The national MPA network currently covers approximately 254,935 hectares, or 13% of territorial waters. This initiative targets a potential expansion to up to 588,311 hectares or up to 30% representation of each coastal marine ecosystem as defined in the NPASP.

[20] 2002 Poverty Assessment Report, National Human Development Advisory Committee, the Government of Belize, June 2004.

46. Many of the fishers in a number of coastal and rural communities, especially in the poorer districts of Corozal and Toledo, only received basic school education and are often illiterate. In some instances, youngsters are removed from school to fish commercially with their fathers and brothers to supplement the family income.[21] Other fishers in the wealthier districts of Belize and Stann Creek have more access to secondary and tertiary education.

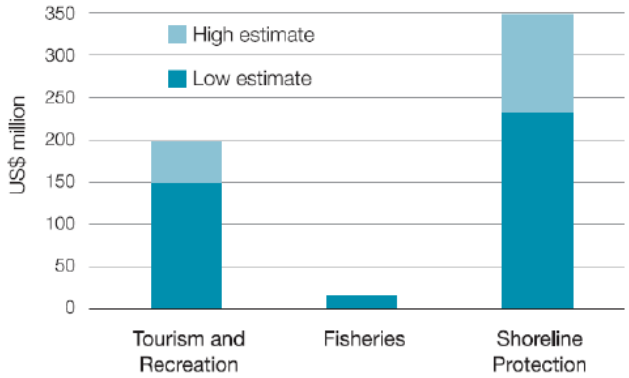
47. The fishers who operate off the Belizean shore are not only from these coastal communities. There has been an increase in Guatemalan and Honduran fishers who have obtained legal fishing licenses from the Belizean Government. The coastal population of Guatemala and Honduras is much larger than that of Belize. Therefore, the additional pressure from these fishers is high enough to threaten the local fishers. Hence proposed activities to improve the reef's protection regime and to provide alternative livelihoods to the local fishers are critical.

Economic Benefits

48. Considering the high importance of tourism to Belize's foreign exchange receipts and the significance of fisheries to the coastal populations, the health of the marine ecosystems is critical to economic stability. The proposed Project would contribute to maintaining and potentially increasing the economic value of the reefs' environmental services in the fisheries and tourism sectors. Also the income level and marine resources available to the local population would potentially be increased through the proposed sustainable management and adaptation of marine resources, and the promotion of alternative livelihoods.

49. ***Fisheries***. Belize's fisheries are threatened by overfishing and a reduction of coral cover. By expanding no-take replenishment zones and promoting complementary fisheries management and adaptation measures, the Project would provide a significant economic benefit in terms of the replenishment and stabilization of valuable marine species.

Figure 6. Annual Economic Contribution of Coral Reefs and Mangroves in Belize



Source: Cooper *et al.*, Coastal Capital: Belize, WRI, 2008

50. Fishing is an important cultural tradition, as well as a safety net and livelihood for many coastal Belizeans. In total, reef- and mangrove-associated fisheries have an estimated direct

[21] Belize National Conch Report, 2005.

economic impact of US$14 to $16 million per year.[22] Over 80 percent of that total is exported, earning roughly US$11.2 million in gross revenue. The fishing industry in Belize provides direct employment for about 1,672 licensed fishers (FAO, 2004). More than 50 percent of these fishers are between the ages of 15 and 35 years and most of these fishers originate from impoverished rural and coastal communities. In addition, the fishing cooperatives employ 123 fulltime employees and the aquaculture farms employ 1,059 employees who are responsible for processing, packaging and administering the daily activities. Although fewer people are now considered 'full-time' fishers, there are many part-time fishers who also work in tourism (or tour guides who also fish). Under the Project, viable alternative livelihoods would be supported to promote the exit of part time fishers.

51. ***Tourism***. The Project would provide economic benefits to coral reef- and mangrove-associated tourism which in 2007 contributed an estimated US$150 million to $196 million to the national economy (12 to 15 percent of GDP). Tourists spent between US$30–$37 million on sport fishing and diving alone (not counting accommodation, etc.). Additional indirect economic impacts, including locally manufactured materials that support the industry, contribute another US$26–$69 million a year. Combined, these result in a total economic contribution of US$175–$262 million from coral reef- and mangrove-associated tourism in 2007. These are "high value" industries that are especially sensitive to reef condition, and thus particularly vulnerable to degradation of the environment which they, themselves, are contributing to.[23]

52. ***Protection***. Reefs and mangroves also protect coastal properties from erosion and wave-induced damage, providing an estimated US$231 to US$347 million in avoided damages per year. By comparison, Belize's GDP in 2007 was US$1.3 billion.[24]

Fiscal Benefits

53. In the long-term, the MCCAI would generate important fiscal benefits for the country of Belize beyond the economic, environmental and social benefits described above. The long-term fund management strategy of the Trust described in Annex 3 shows that the MCCAI can provide much needed debt relief to the Government of Belize at a time in which it is facing falling revenues due to the impact of the global economic crisis. The use of the proceeds to purchase discounted debt in the secondary market increases the amount of resources that will be later available to finance the program of activities.

C. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme.

54. An alternative option to the proposed Project concept was to invest the total amount of the available AF resources in the proposed adaptation measures. This option would invest all the $10 million in a set of priority adaptation measures to be completed in five years without giving a specific effort on creating a sustainable financing mechanism.

55. Compared to this option, the proposed Project would create a sustainable financing mechanism for specific adaptation objectives and related capacity building beyond the Project lifetime. The Marine Conservation and Climate Adaptation Trust (MCCAT), to be established

[22] Cooper, *et al*., Coastal Capital: Belize, WRI, 2008.
[23] Cooper, *et al*., Coastal Capital: Belize, WRI, 2008
[24] These estimates capture only three of the many services provided by coral reefs and mangroves, and should not be considered the "total" value of these resources. These numbers should be regarded as a lower bound estimate.

under Component 2, is conceived as a long-term financing mechanism for the climate adaptation and conservation actions for marine and coastal ecosystems. The funding from the Adaptation Fund would support the initial set up expense (US$0.4 million) of the Trust which is expected to leverage much larger funds from various donors (target of US$100 million). The AF resources will not be used to capitalize the Trust. Rather, it would support the creation of this innovative financing mechanism. After the MCCAT is capitalized with funding from various donors and the fund management mechanism starts to operate, almost US$90 million would be available for climate adaptation investments in less than 20 years. In addition, the MCCAT would have a capital base of between US$100-135 million by 2025 (see Annex 3-B). In effect, a portion of Government external debt service would be redirected to fund national spending related to the Marine Conservation and Climate Adaptation measures, rather than leaving the national economy in the form of outflows to pay foreign debt. In essence, a US$10 million investment by the Adaptation Fund would effectively leverage an additional US$100 million within the first 5 years that would be directed towards financing adaptation activities in Belize.

56. Under Component 1, there are five proposed activities. Sub-components 1 and 2 would specifically mainstream climate change adaptation into the on-going conservation activities. The expansion of MPAs (up to 30% of the marine area) and no-take replenishment zones (up to 15%), is a major and ambitious undertaking aimed at filling the gap in their management and strengthening their enforcement and would form the bulk of the cost allocation of around US$3.1 million. Sub-component 1.3 on the coral restoration activities is aimed at restoring at least 6 coral sites in five years and is allocated around US$1.2 million. Sub-component 1.4 on sustainable alternative livelihoods would provide comprehensive support for viable alternative livelihoods for local populations whose economic activities are dependent on marine resources and impacted by climate change and the expansion of the no-take and MPA network. This activity would specifically support (a) creating jobs, (b) targeted training, and (c) provision of financial resources for initial capital investments in viable options for the target populations with a resource allocation of around US$2.5 million. Sub-component 1.5 on awareness raising activities would support national campaigns and dissemination of information to increase understanding by local stakeholders of the value of marine conservation and impacts of climate. It would also provide training to build local capacity to participate in the program activities and create a visitor and scientific reference centre for knowledge sharing and exchange activities to promote learning and cooperation between the program and the global marine conservation and climate adaptation community. This activity is anticipated to cost $1 million. The total estimated budget for Component 1 is thus $7.8 million. Compared to this modest investment, the economic benefits derived from ecosystem services provided by coral reefs and mangroves in Belize, as estimated in 2007, are calculated to be at least US$14 million per year in the fisheries sector, US$150 million per year in tourism, and US$231 million per year in coastal protection from climate-related hazards such as storms and hurricanes (see Figure 6). Thus the proposed Project approach appears to be quite cost-effective if the alternatives are considered.

57. Another alternative option was to invest the requested resources in adaptation measures for physical structures such as dikes, sand barriers, sea walls, drainage systems, and weather-proofing of buildings to address the impacts of climate change. In a country like Belize where most of the coastal areas are low lying, it would not be cost-effective nor desirable to build heavy structures such as dikes and sea walls all along the coastal areas. The amount of money needed for such investments would be astronomical (way beyond what is requested in this proposal) and it is questionable whether this would be effective against increasingly intense and frequent storms. .

Furthermore, the marine and coastal resources and those who depend on them would remain vulnerable to the climate change impacts. Hence, little long-term benefit may be achieved by investing in such engineered coastal storm defenses as an adaptation strategy since the entire coastal region of Belize is threatened by climate change related sea-level rise and storms/hurricanes. Thus protecting and using natural barriers (in this case the Barrier Reef and associated coastal and mangrove systems) seems to be a better adaptation strategy in the short- and long-term.

58. More detailed cost-effectiveness analysis for each activity will be made during Project preparation as part of the programming.

D. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

59. The Project is aligned with the strategic thrusts in **the National Poverty Elimination Strategy and Action Plan 2009-13 (NPESAP)**, specifically on i) effective mitigation against effects of climate change and natural disaster, and ii) reduction in citizens' vulnerabilities to catastrophic disasters, and with **the Medium Term Development Strategy**, "Building Resilience against Social, Economic and Physical Vulnerabilities" (MTDS, 2010-2013), which is closely linked to the NPESAP. A long-term development plan, **Horizon 2030**, describes the main Government priorities and challenges including (i) strengthen macroeconomic and fiscal management, and (ii) sustainable Environment and Natural Resource Management.

60. **The First National Communication to the UNFCCC** (July 2002) states that Belize has been identified as one of those countries most vulnerable to the adverse impacts of climate change. It is therefore imperative that adaptation measures be identified for the country's most vulnerable sectors and that steps be undertaken for the implementation of the more viable options. The proposed Project would address many of the adaptation measures identified in the First National Communications, for example:

- Enforce the laws regulating conservation and use of biological resources in the marine and terrestrial ecosystems
- Establish and maintain protected areas
- Include biodiversity conservation into adaptation strategies of other sectors
- Discourage construction of new townships in coastal areas
- Discourage construction of new residences within inland coastal plains
- Create alternative livelihoods away from coastal areas

61. The Project is consistent with **the National Protected Areas System Plan (NPASP)**, as it would target the completion of a comprehensive marine protected areas system in accordance with recommendations from this plan, and fulfilling Belize's commitments to the Convention on Biological Diversity Program of Work on Protected Areas. The Project would provide a significant portion of the finance needed to sustain the marine component of the Plan, and also support the NPA authority to reach a legal entity status in order to manage and coordinate the implementation of the NPASP. The Project would also mainstream climate change considerations into the NPASP especially in areas where critical gaps exists.

62. The proposed Project is also aligned with **the Interim Strategy Note between Belize and the World Bank** (March 2009 - March 2011) and in particular supports Pillar I: Reduce Vulnerabilities and Support Sustainable Livelihoods, which includes vulnerability to climate change. As a follow-up, the Bank is currently preparing a four year **Country Partnership Strategy** (2011-15) to further its deepening engagement with Belize, focusing on a comprehensive program aimed at supporting the country's efforts to achieve **Inclusive and Sustainable Natural Resource-Based Growth and Enhanced Climate Resilience**.

63. The CARICOM Heads of State, of which Belize is a member, participating in the First Congress for the Environmental Charter and Climatic Change (held at Ávila Mountain, Caracas, 11-13 October 2007) requested that the Caribbean Community Climate Change Centre (CCCCC) prepare a Regional Framework document that would lay the ground for achievement of the vision of a "Caribbean society and economy that is resilient to a changing climate." This strategic vision is reflected in the *'Regional Framework for Achieving Development Resilient to a Changing Climate (2009-2015)'* that was approved by the CARICOM Heads of Government in July 2009. The Regional Framework provides a roadmap for action by member states and regional organizations over the period 2009-2015**,** while building on the groundwork laid by the CCCCC and its precursor programs and projects in climate change adaptation[25]. It also emphatically notes that (a) CARICOM countries such as Belize have an opportunity to attract climate change finance to support their initiatives to build the resilience of their economies, and (b) developing innovative financing mechanisms to support national climate action is crucial. This Project is directly responding and contributing to these objectives.

64. The Project complements the Caribbean Pilot Program for Climate Resilience (PPCR) financed under the Climate Investment Fund (CIF) which finances climate resilience measures in 6 CARICOM countries (Jamaica, Haiti, Grenada, Saint Vincent and the Grenadines, St. Lucia, Dominica) and region-wide activities addressing climate risks and vulnerabilities common to all Caribbean countries. While Belize does not benefit directly from on-the-ground PPCR investments, it would be able to benefit from regional technical assistance activities (implemented through regional organizations such as CCCCC) such as strengthening climate change modeling and monitoring capacity of regional organizations and strengthening monitoring capacity by increasing the number of monitoring climate change (e.g., sea level and sea surface temperature) stations in the Caribbean especially in those countries with limited resources.

Sustainability/Exit Strategy – Long Term Fund Management

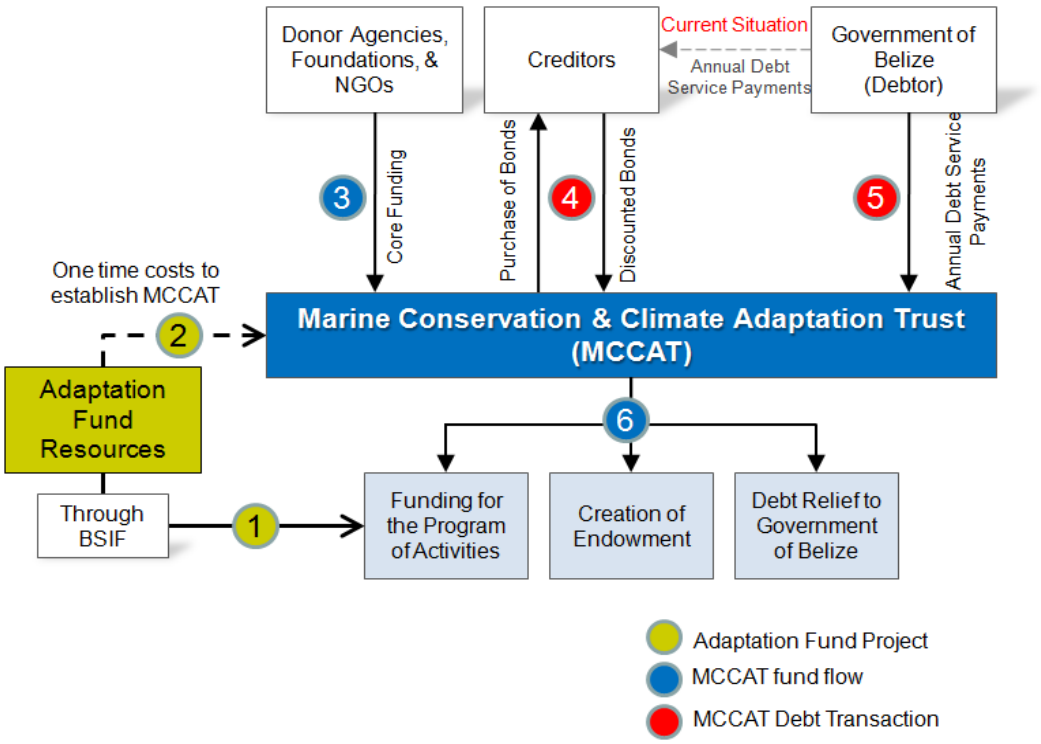
65. The climate adaptation and conservation measures initiated under the proposed Adaptation Fund Project would be expanded and scaled up by the Marine Conservation and Climate Adaptation Trust (MCCAT). The MCCAT would undertake an innovative fund management scheme which would improve fiscal and debt management of the country, while at the same time creating dedicated funding to finance the management of natural resources in the face of increasing impacts of climate change. The MCCAT would facilitate debt transactions in which a portion of Belize's foreign debt is purchased in the secondary market at a reduced value in exchange of the Government of Belize's investments in climate change adaptation and resilience measures. The debt

[25] Including the National Enabling Activities (NEAs), the First National Communications Projects, the Caribbean Planning for Adaptation to Climate Change (CPACC) project (1998-2001), the Adaptation to Climate Change in the Caribbean (ACCC) project (2001-2004), the Mainstreaming Adaptation to Climate Change (MACC) project (2003-2009), and the pilot projects being undertaken under the Special Pilot Adaptation to Climate Change (SPACC).

transaction would reroute financial resources that are now used to repay external public debt, to investments for the proposed climate adaptation and resilience program in Belize.

66. The debt transaction would be operated in the following manner: The core funding to the MCCAT raised from bilateral and private donors would be used to purchase a portion of Belize's outstanding public debt in the secondary market at a discounted value with the GOB realizing the discount on the debt upfront. The remaining purchased debt would be held by the MCCAT which will receive the corresponding debt service payments from the Government of Belize (capital and interest). The MCCAT would use these funds to finance local investments in climate change adaptation and marine conservation measures (Program of Activities), as well as the capitalization of the Trust's endowment to provide long-term funding into the future.

Figure 7. Illustrative Funds Flow of Marine Conservation and Climate Adaptation Initiative including Adaptation Fund Resources



67. The target capital level of the Trust would be US$100 million to guarantee adequate long term funding for conservation and climate adaptation activities, as well as to provide meaningful debt relief to Belize. Potential sources of capital include the OAK Foundation, the Summit Foundation, the Government of Germany, and other private foundations and bilateral donors.

68. Preliminary estimates of the cost of the initial five-year phase of the Program of Activities are estimated at US$21 million, financed by the Adaptation Fund Project and the debt service payments by the Government of Belize. After the initial five year period, ongoing activities would be funded by a combination of the debt service payments plus any investment returns generated by the MCCAT. Once the purchased debt has been fully repaid (in this case, the US$100M), the MCCAT will have sufficient capital to generate annual returns that will meet the long-term funding

needs of the comprehensive Marine Conservation and Climate Adaptation Program (over the long term, the target is to finance a minimum of US$4 million/year plus annual inflationary adjustments).

69. The current structure of climate financing favors poor countries or those with a large carbon footprint. This typology excludes a large number of nations with large vulnerabilities or modest carbon footprints. A mechanism as the one herewith proposed, has the potential to open a third way for financing of adaptation and could also be used as leverage to raise resources for adaptation from non conventional sources. Specifically for Belize, if successful, this transaction would improve the conditions for the country's economic development through improved fiscal sustainability and create a significant national source of funding to address issues of sustainable management, resilience, and adaptation for its barrier reef, and thus secure better conditions for the economic services it provides. Also, if successful, the proposed mechanism could offer an alternative financing tool for adaptation issues in other highly indebted nations that are grappling with similar issues. The proposed transaction is similar in structure to past *Debt-for-Nature Swaps*, but would be the first of its kind to explicitly target marine climate adaptation and resilience efforts.

E. Describe how the project / programme meets relevant national technical standards, where applicable.

70. The Environmental Impact Assessment (EIA) Regulation of the Subsidiary Laws of Belize (2003) defines the EIA requirements and contains a detailed list of the types of activities that an EIA is required. During full Project preparation, measures will be undertaken to ensure full compliance with relevant national requirements and standards as needed.

71. Not only does the proposed Project meet relevant national laws in Belize, it also supports the Government of Belize in the revision of key laws that are currently in draft form and would have an immediate impact on reducing harmful practices and activities in the coastal marine zone.

- Revision of the Fisheries Act and the High Seas Act including a policy governing foreign fishing vessels in Belize waters in order to keep pace with current global thinking on sustainable fisheries management.
- Promotion of mangrove conservation and management practices and enforcement of the laws which have to be improved to guarantee the appropriate level of conservation.
- Protection on fish spawning aggregations through the complete closure of fishing which is still being allowed in some of these areas and two known sites remain open to fishing.
- Promotion of the banishment of harmful techniques such as gill nets, spear gun fishing, fish traps, mangrove clearing and dredging operations within the boundaries of MPAs.
- Development of comprehensive guidelines to inform offshore oil and gas exploration and production in the offshore and near shore marine environment bearing in mind the potential impacts to the Barrier Reef and its protected areas.

F. Describe if there is duplication of project / programme with other funding sources, if any.

72. The proposed Program of Activities is fully aligned with and aimed at scaling up the on-going efforts by the Government of Belize. These efforts include i) strengthening legal framework for Marine Protected Areas, ii) strengthening the institutional capacity of a National Protected Areas (NPA) Authority, iii) revisiting and implementing a Coastal Zone Management Plan for entire

Belize reef, and iv) setting up legal instrument for co-management of National Protected Areas with NGOs and community based organizations.

73. The proposed repopulation of coral reefs is a natural continuation of the technical assistance from the World Bank to Belize. Adaptation measures to identify and propagate thermally resilient varieties of corals to survive in the increasing sea surface temperature have been piloted in Belize with the cooperation of international and local coral experts in 2009. Additionally, Japanese and U.S. researchers have provided scientific expertise in the genetic analysis of the thermally resilient corals. The pilot would be scaled up under the proposed Project. Important information for scaling up was collected from the pilot including the techniques for scoping and extraction of thermally resilient mother corals and the correlation between the location of nursery sites and the survival rate of second generation corals. Also, the preliminary DNA analysis provided critical information on the sample varieties from the pilot nurseries at the clade level, which will be the basis for further scientific analysis at sub-clade level in the proposed Project. The local marine biologists together with the officials from the Fisheries Department involved in the pilot will lead the repopulation efforts with the participation of the local communities in out planting of nursery-grown corals and educational activities.

74. The GOB is also preparing projects with support from the Inter-American Development Bank (IADB) including i) increased access to wastewater treatment through the development of a new sewerage collection and treatment system in the Placencia Peninsula, and ii) support for sustainable energy policy through assessing and providing recommendations to strengthen the energy sector, including renewable energy and energy efficiency alternatives. The proposed Project would collaborate with these activities and potentially build upon their experience in order to address some of the development-related local stresses to the reef.

75. The GOB is currently executing a US$15 million loan from the World Bank invested in a Municipal Development Project. The objective of the project is to improve access to basic municipal infrastructure and to enhance municipal management in selected town and city councils of Belize. BSIF is the executing agency on behalf of the GOB.

76. A European Union (EU) funded Global Climate Change Alliance grant (€2.9 million) for Belize is expected to disburse in 2011. The grant will be implemented by UNDP to enhance adaptive capacity and resilience to climate change in national policies, including the water sector in Belize. According to the EU, 80% of the funds will finance investments in the water sector, where a climate change strategy is already in place with support from the World Bank. The remaining funds will be dedicated to mainstreaming climate change policy, a pre-condition of which is that the Government of Belize establishes a climate change desk.

77. The proposed Project would draw lessons from the GEF-funded Conservation and Sustainable Use of the Barrier Reef Complex project managed by UNDP (1999-2004). The project purpose was to provide decision-makers and relevant stakeholders with analytical, management and technical capacities, decision making and planning tools, and financial mechanisms and economic instruments for long-term conservation of coastal and marine biodiversity. While the project contributed to the adoption of the National Integrated Coastal Zone Management (ICZM) Strategy in 2003, the worsening economic conditions facing Belize have clearly constrained the Government's ability to focus on and continue to implement this program at levels necessary to achieve project outcomes over the long-term.

78. Hence, the proposed Project would support the Government of Belize to implement a Coastal Zone Management (CZM) Plan for improved management of the entire Belize reef to ensure adequate long-term, holistic management of the coastal marine environment. The CZM Plan would reflect an analysis of vulnerabilities of coastal habitation, existing tourism infrastructure, and planned development to climate impacts such as storm surge, siltation, and coastal effluents. (See Sub-component 1.2).

79. The proposed Project would build upon the achievements of the Mesoamerican Barrier Reef System (MBRS) project (2001-2007). The first MBRS project facilitated the cooperation among Belize, Guatemala, Honduras, and Mexico through the adoption of a common policy framework for transboundary sustainable management of resources in the areas of fisheries, tourism, and Marine Protected Areas (MPAs).

G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

80. The activities to be financed under the Adaptation Fund Project will include measures that would contribute to capturing and disseminating lessons learned:

81. **Awareness raising campaign**: One of the key activities of the Project is that of climate change education and awareness raising as it relates the coastal and marine ecosystems. Addressing this area of need across the various priority sectors (tourism, fisheries) will be one of the activities under the Project. Information on the value of coral conservation and impacts of climate change is disseminated to the local people through consultations, educational campaigns, and direct involvement in the coral repopulation efforts. Also the sustainable alternative livelihoods activities will be carefully selected and consulted with the local communities to promote support to/participation in the activities. The target audiences are 1) fishers, 2) eco-tourism operators, 3) coastal communities, 4) private sector, and 5) youth and particularly students in target areas. These activities are quite important for Belize where the general population, including fishers and those who reside in the coastal areas, feel that they do not have enough information and knowledge about climate change and its implications to their lives. There is especially little understanding of the linkage between the anthropogenic stressors and the health of marine and coastal ecosystems, and the environmental/social/economic adaptation benefits that healthy ecosystems would bring in the face of intensifying impacts of climate change. Indeed consultations held earlier during Project Concept preparation with a wide cross section of stakeholders confirmed that there is a need for greater public awareness and education as to the current and likely impacts of climate change and appropriate adaptation strategies. In order to ensure that the proposed climate change education and awareness raising component of the Project is based on a proper understanding of the current level of knowledge, attitudes and practices of the target population, a climate change knowledge, attitude and behavioral practice (KAP) survey would be conducted to identify needs and understand gaps in the knowledge, attitudes and behavioral practices of Belizeans (especially in coastal communities), with respect to climate change. The results of the KAP survey will be used in the design of targeted climate change knowledge and awareness raising program and a communications strategy to improve the knowledge, attitudes, and practices of targeted coastal communities, thereby increasing capacity for climate change resilient communities and economy. The KAP survey will utilize a combination of survey design methodologies, such as stratified random sampling, purposive sampling and cluster sampling. The KAP survey shall be conducted throughout all the coastal communities of Belize, with appropriate representation of the private sector, the public sector,

media houses, the general public/residents, women, men, and children in rural and urban settings, across occupations, income groups and various age categories.

82. In long-term, the MCCAI would also support **a visitor and scientific reference centre** which would gather all the experience collected and that would be open for local and visiting scientists and other interested parties as part of an effort to widely disseminate the information obtained and promote scientific exchanges on the ecosystem-based approach to climate change adaptation. This center could also become a reference place for cooperation and exchange between donors of this Initiative and the wider coral conservation community. In addition, in order to successfully obtain additional funding, the Project would need to summarize the achievements from the activities supported by the Trust. Fund-raising campaign would be continuously carried out throughout the Project life and thereafter.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation.

83. A series of consultations with key stakeholders were held in Belize between February 21st and 25th, 2011 to discuss the country's efforts to achieve sustainable natural resource-based growth and greater resilience to climate change shocks. The main conclusion from the consultations was that Belize must manage its natural resources in a more sustainable manner and strengthen resilience to climate shocks in order to achieve its medium- and long-term development goals. While this conclusion is shared by Government, donors and other stakeholders, and notwithstanding other donor's strong contributions in related areas, there is a clear lack of a holistic approach to address the critical challenges posed by unsustainable natural resource use and climate change.

84. To this end, the Marine Conservation and Climate Adaptation Initiative was jointly conceived by the Government and non-governmental partners. The concept and its design was well received by high level Government officials, and has resulted in a request to the World Bank for further assistance in materializing this Project as a crucial step in implementing MCCAI. Further consultations on the content and scope of the Project have been held with high level Government officials on April 15th, 2011 and between May 9th and 13th, 2011. The list of stakeholders and participants consulted at various times can be found in Annex 4.

85. Through the coral resilience pilot in Belize initiated with the support from the World Bank and various local institutions, consultations and dissemination of the progress were made with local stakeholders (NGOs, marine biologists, fishers, tourism business owners, and students). These stakeholders will continue to be involved in the development of nurseries of thermal resilient coral varieties for transplantation to degraded reef areas.

86. During Project preparation, further consultations will be conducted to define the Project design, specifically the structure of the MCCAT, the fund management, and the initial activities under the program of activities.

I. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

87. The funding from the Adaptation Fund would be invested in a program of specific climate adaptation measures to increase the resilience of the Belize Barrier Reef System. It would also support the establishment and operationalization of the Marine Conservation and Climate

Adaptation Trust (MCCAT) which would in turn redirect financial resources that are currently used to service debt towards a significant in-country climate adaptation investment program to increase the resilience of the reef. The funding from the Adaptation Fund (US$10 million) would leverage much larger funds from various donors (target of US$100 million, resulting in a 1:10 leverage ratio). Thus, the Project is catalyzing a program that would be much larger than funds requested from the Adaptation Fund.

88. Preliminary estimates of the cost of the initial five-year phase of the Program of Activities are estimated at US$21 million, financed by the Adaptation Fund resources and the debt service payments by the Government of Belize to the MCCAT. Once the MCCAT starts purchasing a portion of Belize's external debt and receiving the debt service payments from the Government of Belize (capital and interest), the MCCAT would use these payments and the investment returns from the endowment to finance the Program of Activities. When the purchased debt has been fully repaid (in this case, the US$100M, see Annex 3-B for details), it would have sufficient capital to generate annual returns that would meet the long-term funding needs of the comprehensive Marine Conservation and Climate Adaptation Program (over the long term, the target is to finance a minimum of US$4 million/year plus annual inflationary adjustments).

Component 1: Implementation of initial marine conservation and climate adaptation measures.

89. **Baseline (without Project).** While the on-going measures have been crucial in protecting the critical marine and coastal ecosystems, they have been lacking in programmatically mainstreaming specific climate adaptation into their activities. Under the business-as-usual scenario and as identified in the NPASP, the Marine Protected Areas' (MPA) share is 13% (including no-take zones) of marine ecosystem habitats, and Marine No-Take Replenishment Zones constitutes approximately 2%. While these figures are not small in terms of conservation, they would not be enough to increase the resilience of corals to face the impacts of climate change and the increasing anthropogenic stressors. The value of healthy marine ecosystems and their importance in the face of changing climate are not understood well among the local people. A significant reduction of coral cover would expose the coastal areas to storm surges and coastal erosion. In addition, the local economies which rely on fisheries and tourism which in turn depend on the coral reefs and associated ecosystems would be severely affected. Once the corals are gone, there is no easy way to revive the reefs. In fact, there are no systematic actions to restore the critical reef-building corals which have been massively severed by frequent bleaching events in recent years.

90. Climate change is anticipated to result in an increase in natural disasters including floods and droughts. Sea-level rise will also be associated with saline intrusion into coastal aquifers, affecting the availability of freshwater. Clean water is essential for recovery of corals from a bleaching event. A project funded by European Union (expected to start in 2011) will enhance adaptive capacity and resilience to climate change in the water sector in Belize.

91. Wastewater and lack of proper sewage system not only pose a threat to the country's water resources, but also threaten the growth of corals. In response, the Government of Belize is currently preparing a project with support from the Inter-American Development Bank (IADB) aimed at increased access to wastewater treatment through the development of a new sewerage collection and treatment system in the Placencia Peninsula.

92. **Alternative Scenario (with Project)**. The proposed Project would specifically mainstream climate change adaptation into the on-going activities. The proposed activities would address many of the adaptation measures identified in the First National Communication to the UNFCCC. The proposed Project would expand MPAs (up to 30%) and no-take replenishment zones (up to 15%) and strengthen their enforcement. These are significant and ambitions targets that way above what other countries around the world have set aside. Selection of the new sites would take into account the elements to increase climate resilience such as fish spawning sites, resilient coral reef sites, and climate refugia. Under the alternative scenario, specific climate adaptation would be incorporated into the on-going efforts by the GoB in (a) strengthening the legal framework for Marine Protected Areas, (b) formalizing a legal framework for co-management agreements of National Protected Areas (NPAs), and (c) addressing other core policy and legislation objectives. The proposed Project would also support coral restoration activities that will accelerate natural recovery from and adaptation of reef coral populations to the increasing sea surface temperature, frequent bleaching events, and intensified extreme weather events through repopulation of coral reefs with resilient indigenous varieties grown in the coral nurseries. The activity would establish coral nurseries throughout the Belize barrier reef system and on each of the three atolls to be out-planted into selected areas to increase natural sexual reproduction and restoration of the reef structure. The financing from the Adaptation Fund would be used to also ensure viable alternative livelihoods for local populations whose economic activities are dependent on marine resources and are impacted by climate change as well as by the expansion of the no-take and MPA network. By addressing their livelihoods, the activity would reduce the anthropogenic stresses on the marine resources. This activity would specifically support (a) creating jobs, (b) targeted training, and (c) provision of financial resources for initial capital investment in viable options for the target populations. These would include activities related to improving livelihoods, such as building the climate resilience of aquaculture, agriculture, and tourism, empowering local communities by building their capacity to assess their own needs, training for tour guides and scuba diving, seaweed farming and processing, etc. Another important adaptation benefit from the proposed awareness raising activity would be (a) an increased understanding by local stakeholders of the value of marine conservation and impacts of climate change; b) local capacity to support/participate in the program activities; and c) knowledge sharing and exchange activities to promote learning and cooperation between the program and the global marine conservation and climate adaptation community.

Component 2. **Establishment and capitalization of a sustainable financing mechanism for marine conservation and climate adaptation**

93. **Baseline (without Project).** Under the business-as-usual scenario, Belize would not be able to secure sustainable and predictable financial resources for the Project activities from the national budget. Belize's debt restructuring in 2007 opened the path to restoring fiscal sustainability but total public debt burden remains still high. In February 2007, Belize restructured 98% of its public external commercial debt of US$550 million, avoiding what had been an imminent threat of fiscal crisis. The "Superbond" was structured in such a way that, for the first 12 fiscal years, no payments will be made on the principal and payments will be only made for interest. Starting August 2019, Belize will pay principal payments annually until the bond is paid off in 2029. As a result of the extraordinary actions taken by the Belizean Government, public debt decreased significantly in the last five years (from 98.7 percent of GDP in 2005 to less than 80 percent in 2010) but the debt burden is still high and further actions to lower the debt to GDP ratio are needed. The baseline scenario is based on the macroeconomic assumptions which are consistent with the medium-term macroeconomic frameworks envisioned in the 2010 IMF Article IV consultation. The baseline

scenario assumes the continuation of present policies, which are likely to lead to slower growth and a moderate primary surplus. Under the baseline scenario, Belize's public debt remains high and vulnerable to shocks over the medium term according to the latest debt sustainability analysis (DSA) conducted by the IMF (October 2010). The DSA indicates that under the baseline scenario, debt levels would remain almost constant and slightly under 80 percent of GDP through 2015. The stable debt ratio reflects the positive effect of a gradual increase in growth that offset the impact of the step-up coupon rates on the restructured debt. The baseline scenario is based on the continuation of the current fiscal policy. This assumption implies that growth rate will not be higher than 2.5 percent until 2019 and that the primary surplus will stabilize at 1.5 percent of GDP over the medium term. Slower growth and a low primary surplus will entail higher financing needs which will be mostly covered by external commercial creditors at market interest rates (10 year U.S. T-Bond plus 400 bps) and to a lesser extent by multilaterals lending. Indeed, even after the 2007 debt restructuring, Belize has been servicing a large public external debt to multilateral, bilateral and private debt holders. According to the IMF, in 2009, the public debt service alone accounted for 25 percent of the Government's budget. The limited primary surplus will imply insufficient fiscal space and, therefore, insufficient financial resources to invest in long-term challenges including climate adaptation and conservation measures.

94. **Alternative Scenario (with Project).** The proposed AF Project would create a sustainable financing mechanism, namely the Marine Conservation and Climate Adaptation Trust (MCCAT), for climate adaptation measures for the Belize Barrier Reef System and associated marine and coastal ecosystems. The Trust would be capitalized to a target figure of US $100 million using resources from bilateral, NGOs, and private partners. The Adaptation Fund resources would NOT be used to capitalize the Trust but would allocate a nominal amount (US $0.4 million) to establishing the Trust into which other partners would contribute resources for financing climate action into the future. During preparation of this Project Concept, several partners have already expressed willingness to contribute to the Trust by making financial pledges. The innovativeness of the MCCAT is that it offers predictable and sustainable financing for climate change adaptation actions targeting Belize's critical but vulnerable coastal and marine resources for the foreseeable future. Predictability and sustainability of financing for climate action is a key issue that the international community is grappling with; by raising resources from non-conventional sources (such as non-profit Foundations), MCCAT offers an innovative alternative financing tool for adaptation in Belize and other highly indebted countries faced with similar issues.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

95. **Government of Belize (GOB): The** Ministry of Finance is the designated authority which is charged to endorse the proposed Adaptation Fund Project.

96. **Executing Entity:** Belize Social Investment Fund (BSIF) would execute the Project on behalf of the GOB. BSIF is currently executing the Municipal Development Project with support from the World Bank (a US$15 million loan). Established in 1996 as an autonomous institution, BSIF is a body under the Ministry of Economic Development (MED). BSIF funds community projects in line with the GOB's policies for poverty reduction. BSIF is managed by a management team and Board of Directors comprising representatives from the private sector, NGOs, the Women's Commission, Youth for the Future, the Ministries of Health, Education, Human Development, Rural Development, and MED. Daily operations are organized by a team of 23 managerial, technical and administrative professionals. The community driven approach adopted by BSIF has the overall objective "to maximize the socio economic impact on low income livelihoods and ultimately eradicate poverty in Belize". Between 1996 and 2006, BSIF has implemented over 350 community projects.

97. **Project Implementation Unit (PIU)**: BSIF, in collaboration with the Ministry of Natural Resources and the Environment and Ministry of Agriculture and Fisheries, will establish a separate project implementation unit (PIU) consisting of a project coordinator, key technical staff, financial management and procurement staff. Under the on-going Municipal Development Project, the Bank has been providing BSIF technical support necessary in meeting fiduciary standards for financial, monitoring, and reporting responsibilities. Further specification of responsibilities, staffing and reporting will be detailed in the full-fledged Project document. Detailed implementation arrangements will be elaborated during Project preparation.

98. **Implementing Entity:** The World Bank has been requested (see attached letters) by the GOB to act as the implementing entity and submit the proposal to the Adaptation Fund Board. The Bank would bear the full responsibility for the overall management of the Project financed by the Adaptation Fund, and would bear all financial, monitoring, and reporting responsibilities.

B. Describe the measures for financial and project / programme risk management.

99. The following table summarises the risks and issues of the proposed Project:

Table 4: Risk Matrix

Risk Category	Risk Rating	Risk Description	Proposed Mitigation Measures
1. Project Stakeholder Risks			
1.1 Stakeholder	Low	Stakeholders (local fishermen, tourism business owners, and NGOs) do not support the proposed scheme.	An intensive awareness raising campaign would be carried out to increase the understanding and following buy-in of the local communities. The Operational Manual of the Project will mandate that it will support only activities that comply with

			sound environmental and social safeguard policies. A program of alternative livelihoods is envisioned under the proposed Program of Activities.
2. Operating Environment Risks			
2.1 Country	Low	Due to governance challenges and the long-term nature of the MCCAI, future Governments may not support the goals, targets and commitments of the MCCAI and fail to make debt payments.	Also, the MCCAT is an offshore, legally independent entity. The structure of the debt obligations would maintain the cross-default clauses in force.
2.2 Institutional (sector & multi-sector evel)	Low	The Government does not meet certain policy commitments (e.g. restrictions on ability to de-reserve, additionality commitment, etc.) in accordance to mutually agreed targets.	A policy letter from Ministry of Natural Resources and the Environment has been issued to confirm the GOB commitments.
3. Executing Entity Risks (including FM & PR Risks)			
3.1 Capacity	Medium-Low	The Executing Entity selected for the Adaptation Fund Project and the MCCAT to be created under the Project is not equipped with enough capacity to manage the financial transactions and to implement the program of activities in the future.	The Belize Social Investment Fund has been selected as the EE for its capacity and experience in managing many donor funded projects including the current World Bank-funded Municipal Development Project. The Bank will continue to support in strengthening capacity of BSIF as well as the MCCAT.
3.2 Governance	Medium-Low	The governance structure, operational guidelines and other institutional policies of the MCCAT are altered over time and do not conform to the adequate standards.	The Board of Governors commits to adhere to the standards and guidelines of the Bank.
3.3 Fraud & Corruption	Low	Fraud and corruption occur after the proposed Project is completed.	Voting membership of the Board of Governors includes/will include international donors/NGOs. The Board of Governors commits themselves to adhere to the agreed anti-corruption guidelines of the World Bank.
4. Project Risks			
4.1 Design	Low	Program of Activities is too ambitious.	The activities build upon or scale up on-going efforts in the country. Once MCCAT is operational, the interest payment from the Government will be added to finance the activities.
4.2 Social & Environmental	Medium-Low	Downstream conservation and climate adaptation activities will create social and environmental concerns.	The operational manual of the Project will mandate that all activities supported by the Project comply with safeguard policies of the World Bank. The Policies and procedures of the MCCAT will mandate that all activities supported by the MCCAT comply with safeguard policies modeled on those of the World Bank.
4.3 Program & Donor	Medium-Low	The proposed $100 million capital goal is not reached.	The proposal will go forward even at a lower capital level. However, in that case, adjustments will have to be made on the allocation of resources. Fundraising efforts are being made to secure the total funding

			proposed. So far the prospects have been encouraging with some donors already making pledges.
4.4 Delivery Quality	Medium-Low	Downstream activities to be financed by the MCCAT may not be implemented or may be poorly implemented.	The Board of Governors of the MCCAT will consist of representatives of the Government of Belize, donors, and other experienced conservationists, thus the Board of Governors will rigorously monitor and intervene, if necessary, to ensure the quality of implementation.
4.5 Debt Transaction	High	Uncertainty with respect to the terms of the debt purchase transaction. The final debt relief to Belize depends on the discounted price that could be obtained from the secondary bond market. If prices increase the debt relief could be reduced substantially.	A bond purchasing strategy would be established to reach the bondholders willing to sell at discount. The bond purchase transaction would only take place when market conditions are appropriate.

C. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

100. On-the-ground monitoring and evaluation (M&E) of the Project activities would be the responsibility of the BSIF. Compiling the information gathered, the PIU within BSIF will report regularly to the Bank which will in turn report to the Adaptation Fund Board. The format of reporting and detailed steps will be defined in the full-fledged Project document. The M&E system would be developed during Project preparation and would be based on the Results Framework presented in the next section. The PIU would carefully review the progress of the Project activities during regular field missions and, if necessary, suggest any appropriate adjustments in the results framework for the Project, including milestones, targets and indicators. Such adjustments would require a written consent by the Bank.

101. In addition to the regular monitoring, BSIF will carry out a Mid-Term Evaluation at the end of the second year of implementation. At the end of the final year of the Project, the GOB will carry out a Final Evaluation which will be the basis of the GOB's Completion Report. Both evaluations will integrate findings from the existing M&E system and will also conduct overall assessments of Project implementation to determine if the intended Project outcomes and results are being achieved.

102. The indicative budget for monitoring and evaluation is $40,000 per year which will be financed out of the Project execution cost.

D. Include a results framework for the project proposal, including milestones, targets and indicators.

Table 5. Results Framework

EXPECTED OUTCOMES	BASELINE	TARGETS AND INDICATORS	DATA SOURCE/ METHODOLOGY
Coral reefs' resilience strengthened	1. Marine Protected Areas (MPA) share 13% (this includes no-take zones) of marine ecosystem habitats as identified in the NPASP and Marine No-Take Replenishment Zones approximately 2% 2. Legal foundation of NPAs and the definition and clarity of permissible activities in these areas are not clear. 3. *Acroporis* is now almost (99%) gone. 4. The local unsustainable livelihoods are dependent on the reef. 5. The value of marine conservation and impacts of climate change are not understood well among the local people.	1. Marine protected areas (30%) and no-take replenishment zones (15%) expanded and secured. 2. At least 2 key laws adopted to strengthen the reef's policy and regulatory protection regime 3. At least 6 coral sites repopulated with resilient varieties grown in coral nurseries 4. At least XX alternative sustainable livelihoods proposals implemented by year 5 5. Awareness raising campaigns and dissemination reach 100% of target audiences including decision makers and local communities	Annual report of the Executing Entity
MCCAT is operational and is ready for fund management	No sustainable trust funds in place to support marine conservation and climate adaptation measures in Belize	MCCAT established as an off-shore entity and its Program Administration Unit, Board of Governors, and Technical Advisory Committee fulfill the responsibilities as defined in bylaws and the Operational Manual	Annual report of the Executing Entity

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT[26] *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

Mr. **Joseph Waight** Financial Secretary Ministry of Finance Government of Belize Belmopan City, Belize Email: josephwaight@yahoo.com Phone: 501- 822 3866	Date*: July 11, 2011*

B. IMPLEMENTING ENTITY CERTIFICATION *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (the National Poverty Elimination Strategy and Action Plan 2009-13, the Medium Term Development Strategy, Horizon 2030, and the First National Communication to UNFCCC) and subject to the approval by the Adaptation Fund Board, understands that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
Karin Shepardson Implementing Entity Coordinator	
Date: *07/07/2011*	Tel. and email:
Project Contact Person: Enos E. Esikuri	
Tel. And Email:202-458-7225; eesikuri@worldbank.org	

6. Each Party shall designate and communicate to the Secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

Annex 1. Endorsement Letter

a. Endorsement Letter from Mr. Joseph Waight, Financial Secretary of Ministry of Finance

GOVERNMENT OF BELIZE

Ministry of Finance
Belmopan, Belize

Please Quote:
Ref: C/IOR/3/16/11(14)

July 11, 2011

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
1818 H Street NW
MSN G6-602
Washington, DC 20433

Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Dear Sir/Madam:

Re: Endorsement for the "Belize Marine Conservation and Climate Adaptation Initiative"

In my capacity as designated authority for the Adaptation Fund in Belize, I confirm that the above national project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce risks and adverse impacts posed by climate change in the coastal areas of Belize.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the proposal will be implemented by the International Bank for Reconstruction and Development (the World Bank) and executed by the Belize Social Investment Fund.

Yours sincerely,

MINISTRY OF FINANCE BELMOPAN

JOSEPH WAIGHT
Financial Secretary

cc: Chief Executive Officer, Ministry of Natural Resources

Tel.: 822-2152, 2158. 2362, 2169 Fax.: 822-2886

b. Policy letter from Hon. Gaspar Vega, Minister of Natural Resources and the Environment

Ministry of Natural Resources, and the Environment
Belmopan, Belize, C.A. ph: (501) 822-2711, (501) 822-2249;
Fax: (501) 822-2333, (501) 822-2083
Email: minister@mnrei.gov.bz, ceo@mnrei.gov.bz, info@mnrei.gov.bz

Please Quote
Ref: PS/MNR/184/10(5)

September 3, 2010

NPAPSP Barrier Reef System Adaptation Policy

Background

The National Protected Areas Policy (NPAP) is the key statement on the role and management of protected areas in Belize since 2005. The primary goal of the NPAP is to create a National Protected Area System in which all important sites are included in one coherent framework and that meets all obligations under international agreements to which Belize is a signatory. The NPAP aims for the PA system to: a) be comprehensive, with representative examples of all ecosystems in the country and including areas providing important environmental services, possessing exceptional scenic values and providing critical habitat for species of conservation concern or economic importance; b) be integrated with regional and national approaches promoting biological connectedness (such as the Mesoamerican Biological Corridors Project) and with other national and regional development plans; c) be economically, socially and ecologically sustainable in order to optimize socio-economic benefits derived from the system as far as these are compatible with maintaining biodiversity values and sustainable resource management and ensure the equitable distribution of these benefits and public awareness of their importance; and d) have transparent management geared towards delivery of measurable benefits and emphasize public participation at all levels. This applies to the establishment, management, modification or de-reservation of all the protected areas included in the national network.

The National Protected Area System Plan (NPAPSP) is designed to implement the policy. The design of the NPASP resulted from a series of consultative processes, implemented as part of the two-year national planning initiative that included widespread consultation and participation of relevant government entities (namely, the Forest Department and Fisheries Department), local and international conservation NGO's, community-based organizations, local communities, indigenous communities, academia, and industry. The plan emphasizes the following strategic actions: a) establish a National Protected Areas Authority and National Protected Areas Commission to ensure coordinated action in protected areas (PA) system development; b) revise and consolidate protected area legislation in order to give legislative underpinning to the plan; c) provide support services to protected area managers across the PA system, to enhance management capacity; d) secure comprehensive coverage by concentrating

attention on gaps in the present network of protected areas; and e) simplify the existing PA system by consolidating adjacent protected areas into single, multi-zoned, management units. This creates a smaller number of sites that are individually more important – indeed some will be of exceptional importance on a regional, even global, scale. Overall the NPAPSP aims to create a more effective protected area system that delivers and is seen to deliver tangible benefits yet is more cost-effective and simpler to administer.

Actions necessary to implement the National Protected Policy and System Plan are grouped under four objectives. Each objective has an underlying strategy and the actions are arranged following a critical path to be undertaken over a six-year period. Among them, the actions cover all the issues covered by the National Protected Area Policy and System Plan. Thus, the NPAPSP sets out an overall strategy to make the existing protected area network function effectively. As such, the objectives and actions identified in this policy note are fully consistent with the NPAPSP and will significantly advance the implementation and realization of the Plan.

Activities under Objective 1:. Improve the Reef's protection framework:

1.1. **Strengthening the legal foundations for Protected Areas in order to protect against the removal of PA status of either all or part of the designated area, and to strengthen the definition and clarity of permissible activities in these areas.** Support the Government in the revision and adoption of key laws and processes that would significantly strengthen and further secure the legal status of protected areas.

1.2. **Institutionalizing a National Protected Areas (NPA) authority and National Protected Areas Commission (NPAC).** Support the operations of the existing National Protected Areas Secretariat (NPAS) that will advance the establishment of the NPA authority and the National Protected Areas Commission to reach a legal entity status in order to mange and coordinate the implementation of the National Protected Areas System Plan (NPASP).

1.3. Formalizing a legal framework for co-management agreements of NPAs in coordination with non-governmental organizations (NGOs) and community based organizations (CBOs).

1.4. **Detailed survey and incorporation of marine areas within the Belize Barrier Reef System required to complete the National Protected Areas Plan.** Incorporation of these sites will fill important system gaps identified within the NPAPSP and will significantly enhance the functionality and resilience of the Barrier Reef System to climate induced changes.

1.4.1. Incorporation of system level gaps in the current MPAs system will lead to a net increase size of the MPA system. Based on the findings of 1.4, No-Take Zones will be designated as needed to increase functionality at the ecosystem level.

1.4.2. Increase ecosystem level representation within the Belize Barrier Reef System to include 30%, where feasible, of the marine ecosystems habitats identified within the NPASP (coral reef, sea grass, sparse algae, sandy beaches, mangrove and littoral forests, wetlands, and open sea) to ensure effective conservation and management of marine resources.

1.4.3. Implementation of a comprehensive biodiversity monitoring protocol in order to enable managers to practice well-informed adaptive management of these reserves. This program targets the formalization of a system-level, bi-annual monitoring and reporting program for the MPA Management Effectiveness and bio-physical status of the reef.

1.4.4. Strengthen enforcement and patrolling of No-Take Zones inclusive of those indentified in 1.4.1 to reduce illegal fishing and other illegal activities. This action also targets the establishment of well trained and equipped rapid response mechanisms for marine resource protection as recommended by the NPAPSP; this rapid response mechanism will require inter-agency coordination with relevant resource managers and enforcement agencies to increase resource protection.

1.5. **Utilize integrated management techniques to build capacity for local communities to act as stewards of the marine managed areas and of the resources they depend on, thus creating complementary sources of employment and alternative livelihood opportunities through stewardship**. This action is a necessity considering that that the net increase in MPAs and No-Take Zones resulting from 1.4 will have resource use implications for the communities that use marine resources. Indentifying and increasing alternative livelihood opportunities for communities that rely on marine resources will garner support for the NPASP among these communities.

1.6. Enhance the knowledge base of local communities via a comprehensive public awareness programme to recognize climate induced threats and to manage and address these in order to mitigate negative impacts. This action will be geared to garner broad public support for the implementation of the NPAPSP.

1.7. **Consolidate and simplify the Belize Barrier Reef System of MPAs by amalgamating adjacent sites into single multi-zone management units to allow a more coherent ecosystem level management approach.** This component is consistent with the Objective 4 of the NPAPSP and would allow increase in system functionality and resiliency at the seascape level.

The government of Belize stands ready to implement the activities outlined in this policy document in an effort to reinforce its commitment to environmental conservation and sustainable development. The selected objective considered in this policy documents is intended to assist the government in preserving, monitoring, and enhancing the environmental value of Belize's Barrier Reef System and the surrounding flora and fauna that it supports. This policy position is but a sub-section of the overall National Protected Areas Systems Plan which was designed and developed to ensure that Belize's environmental assets are protected and accessed in a sustainable manner that takes into consideration its local, regional and international responsibilities.

Hon. Gaspar Vega
Deputy Prime Minister and
Minister of Natural Resources and the Environment
Government of Belize

Annex 2. Proposed Marine Conservation and Climate Adaptation Measures (Program of Activities) under Component 1

1. The proposed Adaptation Fund Project would support the initial set of the priority climate adaptation measures to strengthen the climate resilience of the Belize Barrier Reef System. As soon as the MCCAT is fully operational, the interest payment by the Government of Belize and the investment returns from the endowment would finance the full Program of Activities and scale up the priority measures implemented under the Adaptation Fund Project.

2. The initial climate adaptation measures and the full Program of Activities aim to achieve the following activities described below:

(1) Expansion and securing Marine Protected Areas and Replenishment (No-Take) Zones,
(2) Improving the reef's policy and regulatory protection regime,
(3) Scaling up the pilot repopulation of coral reefs with resilient varieties grown in coral nurseries,
(4) Providing a comprehensive support in alternative livelihoods for affected users of the reef,
(5) Raising awareness, building local capacity, and disseminating information.

Sub-component 1.1 Expansion and securing Marine Protected Areas and Replenishment (No-Take) Zones.

3. The program aims to support the Government of Belize in the expansion of Marine Replenishment No-Take Zones from approximately 2% to 15%, and Marine Protected Areas (MPA) from 13% to 30% of the marine ecosystem habitats as identified in the NPASP (this includes no-take zones). This will significantly enhance the ecosystems' functionality, resilience and capacity to adapt to climate induced changes. It is important to recognize that the proposed target increases in No-Take Zones and MPA are contingent on significant debt relief being realized through the transaction (i.e., increase in No-Take Zones would be commensurate with the amount of debt relief realized). As these managed seascapes are expanded, the intention is to include identified fish spawning sites, resilient coral reef sites and climate refugia to ensure that climate-resilient stocks are secured within these sites. These sites would thus ensure the reef's capacity to recover from extreme climate events by providing a sufficiently large and resilient seed stock of critical biodiversity (such as fish and coral) to restock the reef and sustain productivity in the long-term.

Activity 1.1.1 Creation of a network of Marine Replenishment Zones through the gradual enactment and enforcement of No-Take-Zones covering by 2015, 15% of territorial waters. In the face of climate-driven and other anthropogenic threats (V IUCN World Parks Congress 2003 recommendations target up to 20-30% of all coastal marine habitats to be managed as no-take-zones in order to ensure economically productive marine systems.[27]) These would sustain vital stocks of marine species and eventually

[27] To date Belize has less than 2% of its territorial waters as no-take-zones. This initiative targets 15% (from an existing 39,913has. to a targeted 299,347 has.) as no-take-zones across territorial waters, capturing principal landscapes across ecosystems.

boost the supply of fish for important economic sectors of reef systems such as the fishing and tourism industries.

Activity 1.1.2 Creation of new MPAs and Managed Marine Areas in Central Belize to reach 30% representation of all marine ecosystems. Marine scientists recommend that to ensure sustainability of marine resources and functional ecosystem services, 30% of all coastal marine habitats should be set aside as managed protected areas.[28] Through the Belize National Protected Areas System Plan, Central Belize-Marine has been identified as the area of least representation, including the Turneffe and Lighthouse Atolls. The expansion of managed marine areas will serve to buffer the source populations of the no-take replenishment zones, and establish the minimum level of connectivity required for recruitment and replenishment of species to occur throughout the reef.

Activity 1.1.3 Enhancement of the enforcement of no-take replenishment zones and MPAs: Increased and more effective patrolling and enforcement to reduce illegal fishing and other illegal activities. Build capacity for local communities to act as stewards of the marine managed areas and of the resources they depend on, thus creating complementary sources of employment through stewardship. Enhance the knowledge base of local communities to recognize climate induced threats and to manage and address these in order to minimize negative impacts.

Activity 1.1.4 Implementation of a comprehensive monitoring protocol in order to enable managers to practice well-informed adaptive management of these reserves. This program targets the formalization of a system-level, bi-yearly monitoring and reporting program for MPA Management Effectiveness and bio-physical status of the reef.

Sub-component 1.2 Improving the reef's policy and regulatory protection regime

4. The proposed Project is aimed at supporting the on-going efforts of the Government of Belize in the definition of a clear policy vision for managing marine and coastal natural resources. The on-going efforts include (a) strengthen the legal framework for Marine Protected Areas; (b) strengthen the institutional capacity of a National Protected Areas (NPA) authority; (c) develop a Coastal Zone Management (CZM) Plan for improved management of the entire Belize reef; and (d) develop a comprehensive management plan for two fish species, including the participation of the fisheries community. This activity will be led by the Ministry of Natural Resources and the Environment and the Ministry of Agriculture and Fisheries in cooperation with local and international NGOs. Consultations with senior Government officials have yielded a broad agreement that includes all of the goals outlined in this section. A policy letter issued by the Government of Belize, pledging to implement the regulatory and policy actions in support of Sub-component 1 and 2 is included in Annex 1.

5. The program will support the Government in order to assure that the new Trust increases the financial resources allocated to the reef (i.e., is additional to Government investment) rather than replaces Government investment. This will be done through (a) **securing commitment** from the GOB to sustain, and potentially increase, national budget allocations at 2009 levels to the ministerial departments with jurisdiction over PAs (e.g., Forest Department, Fisheries Department, and the Archeology Department); (b) **providing training** for government and non-

[28] The characteristics of the Trust are set forth in accordance with the recommendations of the "Rapid Review of Conservation Trust Funds" by the Conservation Finance Alliance (May 2008).

government personnel to install in the management authorities of the reef the knowledge to be able to interpret relevant climate change impacts and assume approaches for adaptive management.

Activity 1.2.1 Strengthening the legal foundations for Protected Areas in order to protect against the removal of PA status of either all or part of the designated area, and to strengthen the definition and clarity of permissible activities in these areas. Support the Government in the revision and adoption of key laws and processes that would significantly strengthen and further secure the legal status of protected areas.

Activity 1.2.2 Formalizing a legal framework for co-management agreements of NPAs in coordination with non-governmental organizations (NGOs) and community based organizations (CBOs).

6. MCCAT would expand its support to the following activity:

Activity 1.2.3 Strengthening a National Protected Areas (NPA) authority. Support the NPA authority to reach a legal entity status in order to manage and coordinate the implementation of the National Protected Areas System Plan (NPASP).

Activity 1.2.4 Implementation of a Coastal Zone Management (CZM) Plan for improved management of the entire Belize reef. This activity seeks to provide support to the Government of Belize in completing a regulatory framework to guarantee adequate long-term, holistic management of the coastal marine environment. A coastal and ocean zoning plan for Belize is supported through revision of and support to the CZM plan as a crucial management tool. This process would be informed by an analysis of vulnerabilities of coastal habitation, existing tourism infrastructure, and planned development to climate-induced changes in factors such as storm surge, siltation, and coastal effluents. The plan would help to ensure that development and resource use occur in the most climate appropriate locations, and in an appropriate balance with development needs of the Belize economy; a critical consideration in the fragile coral reef environment and one which balances the needs of all stakeholders. In the process the preservation and restoration of valuable natural infrastructure is targeted, such as mangroves and littoral forest which provide coastal protection to vulnerable human populations and coastal infrastructure in the country (e.g., Belize City). The CZM Act will be cross referenced, and if necessary revised to ensure mainstreaming of critical climate change adaptation needs and greater alignment of this Act with present day priorities and geographic jurisdictions.

Sub-component 1.3 Scaling up the pilot repopulation of coral reefs with thermally resilient varieties grown in coral nurseries

7. The program would support coral restoration activities that will accelerate natural recovery and adaptation of reef coral populations to the impacts of climate change through repopulation of coral reefs with resilient varieties grown in the coral nurseries.

8. The program is being designed on the basis of a pilot experience conducted in Belize during the last two years and supported by the World Bank and the GEF which has resulted in promising growth rates and excellent out-plant survivorship to date. Under the pilot program nurseries have been established and a limited repopulation effort has taken place. However, in order to strengthen the climate resilience of the reef and restore ecosystem services like shoreline

protection and fisheries habitat a significant scaled up effort is required. The proposed program would include the following activities. The science around coral reef thermal tolerance and adaptation to climate change is still evolving. Therefore, to ensure the scientific integrity of this component, an independent Scientific Panel will be established to vet the methods, approaches and results. This will help in strengthening and replicating the lessons learned from this exercise to other parts of the world.

Scientific Basis of Selection for Thermal Resilience as a Key Strategy for Climate Adaptation in Coral Restoration Programs

9. Much applied research in coral reef conservation these days is focused on understanding thermal resilience. It has been proposed that deliberate selection, bioengineering, and biomanipulation be seriously considered as a means of enhancing the capacity of reef-building corals to survive the several decades that will be required to slow the pace of global climate change by greatly reducing anthropogenic CO_2 emissions. The basic idea is that by increasing the proportion of corals on the reef that are resistant and/or resilient in the face of frequent bleaching events, tropical hard bottoms will have a better chance of remaining coral reefs and delivering the desired services, instead of metamorphosing into seaweed meadows or bare rock of lower value to society, and greater recalcitrance to restoration efforts.

10. When corals are suffering from so many stressors at once, dealing with only one of these does not make a difference. The reason that thermal resilience is so important is that if this is not also addressed, the insurance on ecosystem services gained from other local interventions will be greatly reduced. Thermal resilience is the card that has to be played, on a local level, against climate change, a problem of global proportions and import. Elevating mean thermal resilience in reef-building corals at a restoration site ensures that mortality from anything but the most severe bleaching events will be minimized, giving natural recovery of coral colonies and populations its best shot. All the best local conservation efforts may in some places be for naught, without this extra edge against global climate impacts.

11. There is little that local efforts can hope to accomplish specifically against the most severe bleaching events, in which coral mortality approaches 100%. Such an event hit the nearly pristine coral reefs of the Phoenix Islands, central Pacific Ocean (Kiribati) during 2002-2003, and the damage was astounding. The real challenge, however, lies in the ability of coral reef communities to withstand multiple, frequent events of moderate or mild severity.

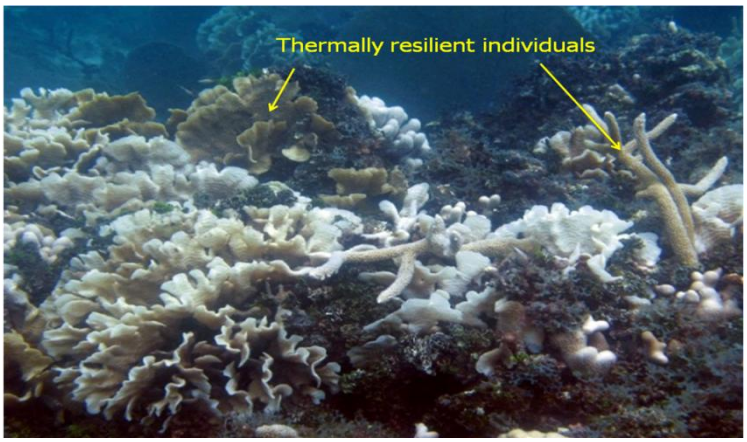
12. What can work, at a minimum, is to promote identifying resistant corals, propagating these strains and species, and restoring them in critical areas on a small scale, to maintain some of the values of a normal, healthy coral reef in places where it matters most. Such efforts, combined with an all-out reduction of local human impacts to make the environment maximally favorable to natural regenerative processes, constitutes a prudent and conservative approach to coral reef restoration on a local scale, in an age of extreme climate events. In the Phoenix Islands, where local impacts are nearly nill, a few oddly resistant and resilient corals survived the most severe bleaching event yet observed, and rose from the reef's ashes like the islands' namesake to bring large tracts of reef back to health in a mere 7 years. The combination of thermally resilient corals and all-out local efforts, are a winning combination.

> **Activity 1.3.1 Establishment of coral nurseries throughout the Belize main barrier reef system and on each of the three atolls**. Multiple nurseries need to be established in each section of the reef to represent the 'ecotypes' there and for greater probability of

survival against bleaching events, storms or disease outbreaks. Selection of mother corals for propagation will be based on past bleaching history and mapping work (Carne 2010). The focus of the efforts will be on the *Acroporids* due to their fast growth rate, importance for reef structure and critically endangered status (2006) but nurseries will include additional stony coral species like *Agaricia tenuifolia*, *Dendrogyra cylindrus*, *Montastrea spp.* and brain corals.

Activity 1.3.2 Repopulation of coral reefs with resilient varieties grown in the coral nurseries. Heat-tolerant corals that have been grown on the nurseries would be out-planted into selected areas to increase natural sexual reproduction and restoration of chosen reef sites**.** Material used for repopulation would be representative, to the extent possible of original population diversity- based on Baums' work at Gladden (2007) that revealed relatively high diversity for *Acropora palmata* and densities. Most of the repopulation effort would be undertaken on reefs that can provide an upstream source of larvae, and/or have significant tourism and fisheries value and whenever possible, are located in protected areas.

Figure 1. Bleaching in Belize, October 2008



Source: A. W. Bowden-Kerby and L. Carne

Figure 2. Pilot Nursery in Laughing Bird Caye National Park, March 2009

Source: A. W. Bowden-Kerby and L. Carne

13. MCCAT would expand its financing to the following activity:

Activity 1.3.3 Characterization of coral host and zooxanthellae genetics. Survivors of past bleaching events will be subjected to genetic characterization to ensure genetic diversity. The symbiotic algal clades would also be identified in an effort to further elucidate the role they place in coral resilience to bleaching. The genetics work would be conducted under terms of a partnership with a scientific advisory committee.

Sub-component 1.4 Providing a comprehensive support in alternative livelihoods for affected users of the reef

14. The program aims to ensure alternative livelihoods for local populations whose economic activity might be temporarily impacted due to the expansion of the no-take and MPA network. An incentive program would be developed to persuade resource users to trade in equipment (e.g. gill nets) that have negative impact on marine species. The program would focus on alternative livelihoods that will support the management structure of a resilient reef. Specific objectives are to (a) create jobs, (b) provide training, and (c) provide financial resources for initial capital investment in vulnerable areas and to the impacted populations.

Activity 1.4.1 Job Creation. This program would address those to be affected by the increased protection of the reef's resources, exploring activities that support the management of the reef, and guarantee sufficient income. The goal is to provide for 100 percent job creation to fishermen that are displaced from fishing in the early years before the fish stocks rebound. This program would target climate-relevant opportunities, such as MPA protection, restoration projects, or pursuits related to healthy reefs such as ecotourism.

Activity 1.4.2 Training. A comprehensive training program in options for custodianship and that will be implemented to facilitate the transition to the alternative livelihoods pointed out by a job creation strategy for resilience in human populations and their livelihoods as they depend on the reef. Sustainable reef management activities led by local populations will allow the poorest members of the communities to realize benefits from their efforts in conserving these resources. Exposure and dialogue with communities to arrive at appropriate community interventions will depend partly on encouraging peer to peer technology transfer from experienced groups and technical training to be provided under the Project.

Activity 1.4.3 Provision of financial resources for initial capital investment. This activity aims to make resources available, including micro-financing schemes, in vulnerable areas and to the impacted populations, in order to provide the initial capital for new ventures. Investing in livelihood enhancing community projects is a key pillar for reducing pressure on the reef system. Using participatory approaches, proposals would be sought from communities in the targeted areas to invest in livelihood enhancing microprojects which support the functional integrity of the reef. The approach would bring different actors from different communities/sectors under a steering committee to vet and prioritize proposals. Once proposals are selected, targeted engagement with communities, employing capacity building techniques and technical training would be used to support the communities in implementation of their microprojects. Arrangements would maximize synergies for capacity building, building on existing Community Based Organizations (CBOs) to support community microprojects. This would provide an

efficient, multisectoral delivery mechanism for community based interventions in the management of the reef.

Sub-component 1.5 Raising awareness, building local capacity, and disseminating information

15. Through awareness raising campaign, the program aims to (a) increase the understanding of the local people of the value of marine conservation and impacts of climate change, (b) promote disaster risk reduction approaches in vulnerable communities, and (c) promote support/participation in the program activities, e.g. outplanting/monitoring of corals and the role of MPAs in securing food sources and livelihoods in the face of climate change. It would also support a reference and visitor center for marine conservation and climate science to promote cooperation between the program and the global coral conservation community through communications and publications.

Activity 1.5.1 Raise awareness and promote community-based adaptation and conservation measures. The objectives are a) to increase the understanding of the local people of the value of marine conservation and impacts of climate change, through awareness raising campaign; b**)** to promote understanding on the importance of the National Protected Areas Policy and System Plan and community-based adaptation and conservation measures in vulnerable terrestrial communities; and c) to build and enhance the capacities of selected existing national institutions to define, articulate and implement measures that enhance the climate resilience of the Belizean economy, communities, and ecosystems . The target audiences are 1) fishermen, 2) eco-tourism operators, 3) coastal communities, 4) private sector, and 5) youth and school students. It also aims to strengthen sharing of information between this initiative and the global coral conservation community through communications and publications.

16. MCCAT would expand its financing to the following activity:

Activity 1.5.2 Build local capacity in order to promote support/participation in the Program of Activities, e.g., outplanting/monitoring of corals and enforcement of MPAs.

Activity 1.5.3 Support a reference and visitor center for marine conservation and climate science. This center would provide a focal point in Belize, and house the priority-setting body (Technical Advisory Group) for marine and climate related research in the Marine Conservation and Climate Adaptation Program. It would host functions for effective implementation, research, scientific cooperation, exchange, and dissemination of lessons learned.

Annex 3: Detailed Information about the Marine Conservation and Climate Adaptation Trust

A. Preliminary Guidelines for Trust Management

17. In this annex some key aspects of the design and operationalization of MCCAT are analyzed and summarized based on accumulated experience. Nevertheless, the final design, structure, organization and operational guidelines/manual will result of a negotiation process involving all interested parties. The financial structure of the operation will be adjusted to serve the overarching objective of creating social, institutional and financial conditions for sustainability of the Belizean Barrier Reef. The following key elements have been identified:

18. ***Linking debt relief to building an enabling policy environment.*** Options are being identified to create positive incentives complementing the GoB analyses, processes and policy reforms conducive to the long term sustainability of the coral reef system and the provision of its environmental services. Initial advances in the policy dialogue have included the identification of actions to strengthen the legal foundations for protected areas; advances in the establishment of the National Protected Areas Authority and the National Protected Areas Secretariat; work towards formalizing a legal framework for co-management agreements of NPA; and, a revision of the other core policy and legislation relevant to marine areas within the Belize Barrier Reef System to increase management effectiveness. Moreover, discussions have started on the definition of the reforms needed between the international environmental community and the GoB. The key priority policy elements to be included in the dialogue with the GoB are summarized in Table 1, below:

Table 1: Priority policy actions agreed for debt relief transaction (TBD)

Formal policy adoption	Target	Weight
Strengthen legal framework for MPA; Expand and secure MPA and replenishment (no-take) zones	New Act enacted Xxxxxkm^2 under MPA and YYYY km^2 as no-take zones	25
Develop and adopt a Coastal Zone Management Plan for coral reef areas and zones of influence	Coastal Zone Management Plan enacted, covering xxxxx km^2	25
Revision of Fisheries Act and High Sea Act consistent with the FAO Code of Conduct for Sustainable Fisheries	New Fisheries and High Sea Acts proposed	25
Revision of EIA Act and Regulations, including development and enactment of comprehensive guidelines for offshore oil and gas exploration and exploitation, including do's and do-not's in and around MPAs; and articulation of a climate change policy	Revisited EIA Act and Regulations proposed	25

Note 1: The policy adjustments should be defined as part of Project preparation and agreed with GoB.

Note 2: Weights indicate the percentage of the debt relief transacted once the policy option agreed is completed.

19. ***Identification of default conditions where legal remedies might be required.*** The following conditions have been identified:

- Government fails to make debt payments
- Government does not meet its investment commitments in conservation at 2009 levels
- Government does not meet certain policy commitments (e.g. policies summarized in Table 1.) in accordance to mutually agreed dated targets.

20. ***Funding rules for activities supported through MCCAT.*** The specific conditions for the request for proposals (RFP) opened by MCCAT will be tailored to each sub-component; nonetheless, some general rules will be used reflecting the Bank experience. Among the rules the following are to be included in all process to allocate the MCCAT resources:

- Whenever possible a competitive process will be used;
- A limit will be set on the maximum allocation for government-led initiatives. Such limit has been preliminary set at 30 percent. If consultancies are required to support policy reforms the limit could be increased to 35 percent of the annual grant budget;
- A limit will be defined on the maximum use of MCCAT grant resources devoted to project management. In no case such proportion should be above 15 percent of the grant award;
- Rules will be developed creating incentives to attract matching funds.
- International organizations are eligible to receive funding at a maximum of 10% of the annual grant budget for the implementation of program activities, with a pre-set match requirement.

21. ***Basic governance guidelines.*** *Setting up the MCCAT will follow the guidelines developed by the OECD and the IFC. In addition the following general rules would be applied:*

- MCCAT will be developed based on a clear mandate, as well as detailed description of key personnel duties and responsibilities;
- A disclosure policy will be adopted including good transparency practices;
- Corporate mandate provisions will be included with assurances that the allocation of grant resources will closely resemble a competitive process with well defined and objective qualification criteria;
- A conflict of interest policy will be developed, with severe consequences for non-complaint behavior;
- Performance audits will be complemented with social and environmental safeguard audits.

22. ***Long term orientation, monitoring and scientific rigor.*** In order to insure that the MCCAT maintains its long term vision, provisions are being studied to give preference to long term strategic activities over short term possible high impact high visibility activities. A scientific committee is being formed to have overview on activities seeking coral reef resilience. This will provide the necessary long term guidance for the program of action. Moreover, the scientific committee will also assure high quality work, constant peer review and a forum for exchange of knowledge and experiences.

23. Monitoring will be a very important element in the culture of MCCAT. It will be part of the governance structure as well. In particular monitoring activities will cover a wide range of activities including:

- Fiduciary responsibilities;
- Social and environmental safeguards, following the Bank's guidelines;
- Environmental monitoring, supporting GoB efforts to have an accurate description of the reef system and its evolution as temperature continues to increase and measures are implemented to reduce the negative impacts of other anthropogenic activities.
- Every five years the MCCAT will go through a performance evaluation process to guide reforms as needed and to improve the targeting of the grant resources.

24. **The Marine Conservation and Climate Adaptation Trust (MCCAT)** would be established and developed into an independent legal entity which would be fully responsible for the financial management of debt transaction and the implementation of the program of activities once it becomes operational under the proposed Project. The Adaptation Fund Project would support the operationalization of the MCCAT through developing bylaws and the Operational Manual, designing the investment strategy, assembling its Board of Governors and the Technical Advisory Committee, recruiting PAU staff, adopting a multi-year strategy, designing requests for proposals (RFP), as well as establishing policies and procedures for (1) receiving proposals, (2) reviewing proposals, (3) making grant decisions, (4) disbursingfunds, and (5) exercising monitoring processes. While the full details will be worked out consultatively, the MCCAT is expected/planned to have the following legal and functional structure:[29]

1) The MCCAT will be incorporated as an off-shore independent legal entity.
2) The MCCAT will be governed by a representative Board of Governors, to include:
   a) a non-Government of Belize chair;
   b) a non-Government of Belize majority with the exact split to be agreed to in consultation with the Government and other MCCAT stakeholders;
   c) voting membership for two international donors/NGOs.
3) The Board will include members with financial and fiduciary expertise.
4) The Board will develop a multi-year strategy for addressing marine conservation and climate adaptation.
5) The Board will review, and evaluate for approval, an annual work-plan for the Marine Conservation and Climate Adaptation Program activities. This work-plan will be greater in specificity in order to accomplish the specific goals of the program. Following the first 5 years the work plan will constitute a set of priorities for evaluating the applicable year's grant proposals.
6) The MCCAT will have a Belize-based Program Administration Unit (PAU) to design and oversee the execution of the Marine Conservation and Climate Adaptation Program work-plans; and award and manage disbursements.
7) The MCCAT will adopt its own safeguards provisions based on the World Bank Fiduciary and Safeguards Provisions[30] for governance and program implementation for the life of the trust .
8) MCCAT will follow appropriate conflict of interest rules regarding the awarding of grants and contracts.

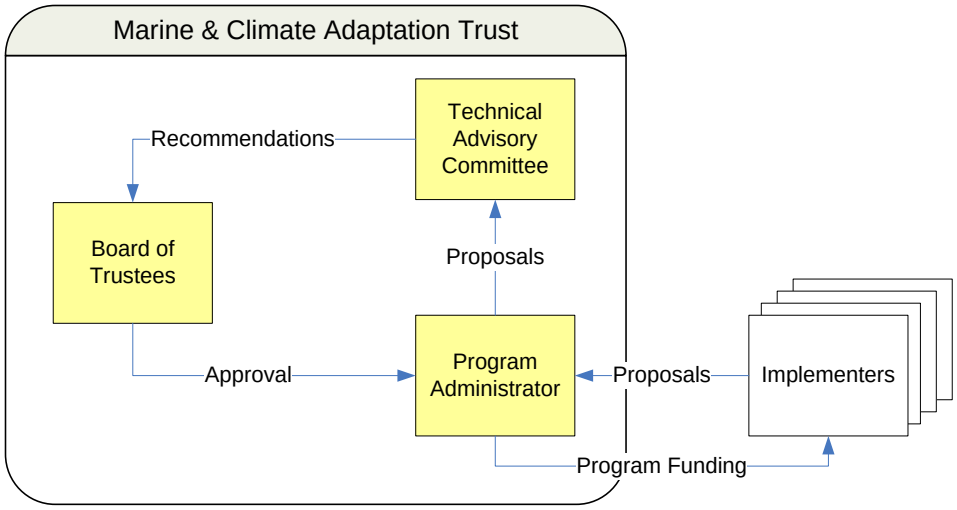
25. **The Program Administration Unit (PAU)** will be in Belize, and will assume key operational functions, including: (a) fund management; (b) development of annual work plans; (c) management and supervision of grants for the program of activities; (d) procurement, disbursement, and financial management; and (e) monitoring and evaluation, e.g., preparation of financial reports and annual implementation reports. It will also ensure that the MCCAT will apply the World Bank Fiduciary and Safeguards Provisions for governance and program implementation. The PAU will be overseen by the Board of Governors of the Trust through the review of the annual work plans and annual implementation reports. Once the Trust becomes fully operational, the PAU will be responsible for the management and supervision of the program of activities. In addition, the technical aspects of the MCCAT as well as selection of

[29] The characteristics of the Trust are set forth in accordance with the recommendations of the "Rapid Review of Conservation Trust Funds" by the Conservation Finance Alliance – May 2008).
[30] http://go.worldbank.org/2G5SSZAET0

proposals for program funding are overseen by Technical Advisory Committee as described in the previous section.

26. The MCCAT would, in addition, be supported by a standing **Technical Advisory Committee** made up of a multi-sector public-private partnership of marine conservation and social development stakeholders who will provide technical advice, science-based information, and guidance on structuring this initiative. The Technical Advisory Committee would review proposals to the MCCAT as defined by the Board, and offer recommendations to the Board. The Program Administrator will consist of in-country MCCAT staff to oversee the execution of the Marine Conservation and Climate Adaptation Program work plans, and award and manage disbursements.

Figure 1. Selection Process of Proposals for community-based activities



B. MCCAT Debt Transaction Mechanism

1. **Upfront savings on debt principal from purchasing discounted debt:** The debt transaction hinges on purchasing the "superbond" at a discounted price. For example, if the bond purchase transaction were to take place under the market conditions prevailing as of May 15, 2011, an upfront discount of 15 percent[31] of face value of the purchased debt could be passed on to the Government as principal reduction immediately upon implementation of the transaction. Table 1 below shows the summary results, in terms of total debt relief to the Government, under different assumptions for the market discount rate achieved after purchasing the bonds. All these scenarios assume an annual investment return (net of expenses and above US inflation rate) of 3 percent. In addition, Table 2 below shows the complete set of assumptions and detailed results of the baseline scenario. Other scenarios were calculated using the same methodology presented in that table.

Table 1: Potential Debt Relief under Different Discount Rates (USD million)

Discount on Superbond	Upfront Principal Write-Off	Cash Flow Debt Relief Over the First 10yrs	Cash Flow Debt Relief Over Life of Super Bond	Total Debt Relief Upfront + Cash Flow
10%	11	29	48	59
15%	18	34	55	73
20%	25	41	63	88
30%	43	55	83	126

2. The interest rate on the "Superbond" increased from 4.25 to 6 percent in February 2010, and is scheduled to increase again to 8.5 percent in February 2012. In addition, the "Superbond" notes have a 10 year amortizing structure starting in August 2019. The February 2010 increase alone implied an increase of US$12 million per year of additional interest payments. As shown in Table 1 above, if the proposed debt transaction were to be realized under current market conditions, the total debt relief (in nominal terms) could range from $59 to $126 million depending on the discount rate achieved. The debt relief generated from the proposed transaction, combined with continued fiscal prudence, would contribute to the Government's goal of placing its fiscal and debt situation on a more sustainable path, which should improve Belize's credit ratings.

[31] The discount rate of Belize debt is market driven and therefore unpredictable. For example, throughout the development of this program, it has gone from 50% (mid 2009) to 10% (in November 2010).

Table 2: Baseline Scenario
Simulation of Resulting Cash Flows after Debt Transaction Assuming a 15% Market Discount Rate
All figures in USD millions unless otherwise noted

Main Assumptions:

Total funds raised from donors	100.0
Market discount obtained (%):	15%
Endowment fund returns over US inflation (%)	3%
Project expenses during the first 5 years	21.0

Endogenous Variables:

Total Debt Purchased after discount	117.6
Upfront Debt Relief	17.6

Year >	2012	2013	2014	2015	2016	2019	2020	2021	2024	2025	2026	2027	2028	2029	Total
1) Debt service generated by bonds held by MCCAT trust:	**7.3**	**8.5**	**8.5**	**8.5**	**8.5**	**13.5**	**18.1**	**17.2**	**14.7**	**13.8**	**13.0**	**12.1**	**11.3**	**5.2**	**209.0**
of which, Principal Amortizations	0.0	0.0	0.0	0.0	0.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0	**100.0**
of which, Interest	7.3	8.5	8.5	8.5	8.5	8.5	8.1	7.2	4.7	3.8	3.0	2.1	1.3	0.2	**109.0**
2) Financing requiered to cover program expenses*	**4.2**	**4.2**	**4.2**	**4.2**	**4.2**	**4.6**	**4.7**	**4.8**	**5.2**	**5.4**	**5.5**	**5.7**	**5.9**	**6.0**	**87.6**
a) from Adaptation Fund	2.0	1.6	1.6	1.6	1.1	-	-	-	-	-	-	-	-	-	**7.8**
b) from MCCAT Investment Returns	0.0	0.2	0.4	0.7	0.9	1.6	2.1	2.8	5.1	5.4	5.5	5.7	5.9	6.0	**52.7**
c) from Debt Service of bonds held by MCCAT	2.2	2.5	2.2	2.0	2.2	3.0	2.6	2.0	0.1	0.0	0.0	0.0	0.0	0.0	**27.1**
3) Debt Service Relief to Belize:	**20.9**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.4**	**3.3**	**2.8**	**2.7**	**2.5**	**2.4**	**2.2**	**2.1**	**72.9**
a) savings from upfront relief (due to 15% discount):	18.9	1.5	1.5	1.5	1.5	1.5	1.4	1.3	0.8	0.7	0.5	0.4	0.2	0.1	**36.9**
b) additional cash returned to government	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	**36.0**
4) Cash Flow used to build endowment fund	**3.1**	**4.0**	**4.3**	**4.5**	**4.3**	**8.5**	**13.4**	**13.2**	**12.5**	**12.3**	**12.0**	**11.7**	**11.3**	**5.8**	**153.5**
a) from Returns Available for Reinvestment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	1.5	2.1	2.6	**7.6**
b) from Det Service held by trust (1 - 2c- 3b)	3.1	4.0	4.3	4.5	4.3	8.5	13.4	13.2	12.5	11.8	11.0	10.1	9.3	3.2	**145.9**
Endowment Fund Balance at end of period	**3.1**	**7.1**	**11.3**	**15.9**	**20.2**	**35.5**	**48.9**	**62.1**	**100.5**	**112.8**	**124.7**	**136.4**	**147.8**	**153.5**	

C. Policy and Legislation

Objectives to foster an enabling environment of stronger policy, laws, and regulations that will be critical to the success of this initiative.

Support the Government of Belize in the revision and enactment of key laws that are currently in draft form, have undergone significant consultation, and would have an immediate impact on reducing harmful practices and activities in the coastal marine zone.

- Revision and enactment of the Fisheries Act and the High Seas Act including a policy governing foreign fishing vessels in Belize waters. Promote the review and enactment of the Fisheries Act in order to keep pace with current global thinking on sustainable fisheries management.
- Promote mangrove conservation and management practices and enforcement of the laws. Mangroves are an extremely valuable ecosystem to Belize, contributing to fisheries, tourism and shoreline protection, and carbon storage, and the current mangrove regulations have to be improved to guarantee the appropriate level of conservation.

- Complete protection on fish spawning aggregations through the complete closure of fishing. Although Belize has been a leader in the region, protecting 11 of its known reef fish spawning aggregation sites, fishing is still being allowed in some of these areas and two known sites remain open to fishing. Enforcement during the closed season for the Nassau grouper will be better served, and easier to implement with an equal treatment of all fishers at all sites.

- Promote the banishment of harmful techniques such as gill nets, spear gun fishing, fish traps, mangrove clearing and dredging operations within the boundaries of MPAs.

- Protect sharks and develop and adopt a National Plan of Action for sharks.

- Develop comprehensive guidelines to inform offshore oil and gas exploration and production in the offshore and near shore marine environment bearing in mind the potential impacts to the Barrier Reef and its protected areas.

- Evaluation of the EIA process and appropriate review of the EIA Act and Regulations, with the purpose of strengthening of compliance monitoring plans and ensuring transparency in the EIA approval processes. This program aims to support in developing new tools for more holistic methods for evaluating cumulative environmental impacts by operationally non-related development activities.

D. PROPOSED SCIENTIFIC COMMITTEE

Objective: Provide external feedback, advice and independent peer review to the Belize Coral Adaptation Program.

Commitment: Semi-annual feedback on planning and results of the Project. Possible rare committee meetings in person in Belize.

Ernesto Weil
Leading researcher on reef health and coral disease, reported *Diadema* disease in early 1980's
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Dr. Judith Lang, retired (formerly University of Texas, currently in Maryland)
leading senior Caribbean coral biologist, extensive work on acroporids, co-lead, AGRRA
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The Nova Southeastern University

Annex 4. Local Consultations List of Participants

Consultations between February 21st and 24th, 2011

Non-state Stakeholders:

1. Albert Reimer, BAS Group
2. Alex Martinez, The Nature Conservancy
3. Amanda Burgos Acosta, Belize Audubon Society
4. Dareece Chuc, Belize Audubon Society
5. Dudley Heredia, Belize Audubon Society
6. Andre Cho, Geology and Petroleum Department (GPD)
7. Audrey Matura-Shepherd, Oceana
8. Colin Gillett, Coastal Zone Management Institute (CZMAI)
9. E. Irving, Galen University
10. Ernest N. Raymond, Social Investment Fund (SIF), Belize Municipal Development Project
11. Imani Fairweather Morrison, Oak Foundation
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23. Olivia Rhaburn, National Association of Village Councils of Belize (NAVCO)
24. Orlando Dawson, NAVCO
25. Seleni Matus, Belize Tourism Board
26. Tracey Hutchinson, Belize Social Security Board
27. Yvette Alonzo, Association of Protected Areas Management Organizations (APAMO)
28. Evita Quiroz, APAMO
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Consultations between May 9th and 13th, 2011

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2. Mr. Joseph Waight, Financial Secretary, Ministry of Finance, Belize
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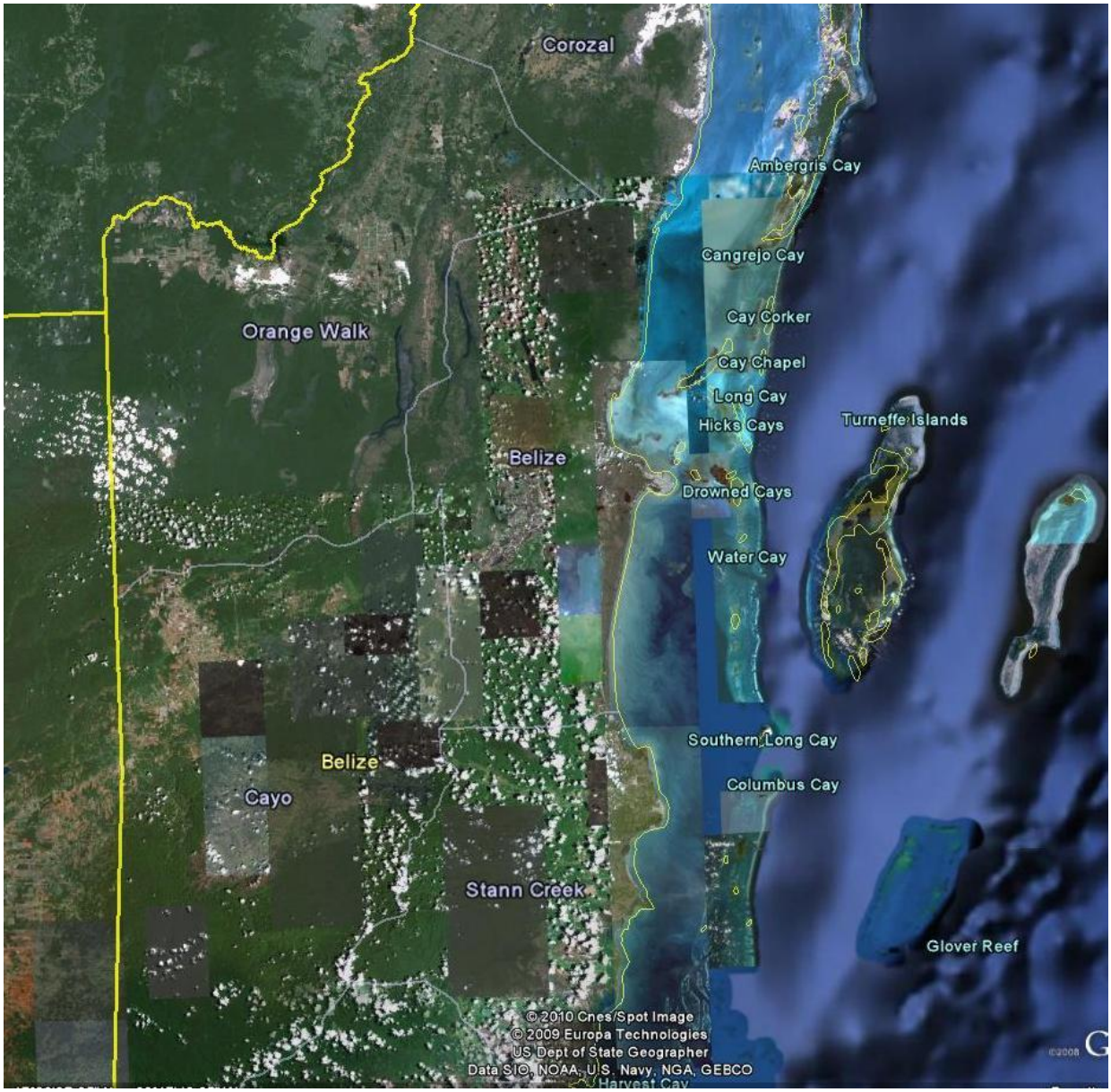
16. Dr. Ulric Trotz, Science Adviser, Caribbean Community Climate Change Centre
17. Mr. Mark Bynoe, Environmental/Resource Economist, Caribbean Community Climate Change Centre
18. Mr. Winston Bennett, Project Manager, Caribbean Community Climate Change Centre

Annex 5. Map of Reef Area in Belize



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