Document of
The World Bank

Report No: PAD272

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED GRANT

FROM THE ADAPTATION FUND

IN THE AMOUNT OF US$5.53 MILLION

TO

BELIZE

FOR A

MARINE CONSERVATION AND CLIMATE ADAPTATION PROJECT

February 10, 2015

Environment and Natural Resources Global Practice
Caribbean Country Management Unit
Latin America and the Caribbean Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective November 25, 2014)

Currency Unit	=	Belize Dollar
US$ 1.00	=	BZ$ 1.98
BZ$ 1.00	=	US$ 0.51

FISCAL YEAR

April 1 – March 31

ABBREVIATIONS AND ACRONYMS

AF	Adaptation Fund
AOP	Annual Operating Plan
CAC	Coastal Advisory Committee
CARICOM	Caribbean Community
CBD	Convention of Biological Diversity
CBWS	Corozal Bay Wildlife Sanctuary
CCAD	Central American Commission on Environment and Development
CPS	Country Partnership Strategy
CQS	Selection Based on Consultant's Qualifications
CZM	Coastal Zone Management
CZMAI	Coastal Zone Management Authority and Institute
DOE	Department of the Environment
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
FM	Financial Management
GAC	Governance and Anti-Corruption
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoB	Government of Belize
ICB	International Competitive Bidding
IUCN	International Union for Conservation of Nature
KAP	Knowledge, Attitude and behavioral Practice
LCS	Least-Cost Selection
M&E	Monitoring and Evaluation
MFED	Ministry of Finance and Economic Development
MFFSD	Ministry of Forestry, Fisheries, and Sustainable Development
MPA	Marine Protected Areas
NCB	National Competitive Bidding
NAPSP	National Protected Areas Policy and System Plan
NBSAP	National Biodiversity Strategy and Action Plan
NGOs	Non Governmental Organizations
NPASP	National Protected Areas System Plan

NPESP	National Poverty Elimination Strategy and Action Plan
PA	Protected Area
PACT	Protected Areas Conservation Trust
PDO	Project Development Objective
PIAG	Project Implementing Agency Group
POM	Project Operational Manual
PP	Procurement Plan
QCBS	Quality- and Cost-based Selection
SBD	Standard Bidding Document
SST	Sea Surface Temperature
SLR	Sea-level Rise
SWCMR	South Water Caye Marine Reserve
TAMR	Turneffe Atoll Marine Reserve
TAC	Technical Advisory Committee
TAT	Turneffe Atoll Trust
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WRI	World Resources Institute

Regional Vice President:	Jorge Familiar
Country Director:	Sophie Sirtaine
Senior Director:	Paula Caballero
Practice Manager (Acting):	Emilia Battaglini
Task Team Leader:	Enos E. Esikuri

BELIZE
Marine Conservation and Climate Adaptation Project

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PAD DATA SHEET

Belize

Marine Conservation and Climate Adaptation Project (P131408)

PROJECT APPRAISAL DOCUMENT

LATIN AMERICAN AND THE CARIBBEAN

Environment and Natural Resources Global Practice

Report No.: PAD272

Basic Information			
Project ID P131408	EA Category B - Partial Assessment	Team Leader Enos E. Esikuri	
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [ ]		
Project Implementation Start Date 01-May -2015	Project Implementation End Date 31-Oct-2019		
Expected Effectiveness Date 01-May-2015	Expected Closing Date 31-Mar-2020		
Joint IFC No			
Practice Manager Emilia Battaglini	Senior Global Practice Director Paula Caballero	Country Director Sophie Sirtaine	Regional Vice President Jorge Familiar

Borrower: Belize			
Responsible Agency: Ministry of Forestry, Fisheries and Sustainable Development			
Contact:	Adele Catzim-Sanchez	Title:	Chief Executive Officer
Telephone No.:	(501) 822-0401	Email:	ceo@ffsd.gov.bz
Responsible Agency: Protected Areas Conservation Trust			
Contact:	Dennisia Francisco	Title:	Executive Director
Telephone No.:	501-822-3637	Email:	dennisia@pactbelize.org

Project Financing Data(US$M)							
[ ]	Loan	[ ]	IDA Grant	[ ]	Guarantee		
[ ]	Credit	[X]	Grant	[ ]	Other		
Total Project Cost :		7.31		Total Bank Financing :		0	
Financing Gap :		0					

Financing Source	Amount(US$M)
BORROWER/RECIPIENT	1.78
ADAPTATION FUND	5.53
Total	7.31

Expected Disbursements (in US$ Million)

Fiscal Year	2015	2016	2017	2018	2019	2020	0000	0000
Annual	0.6	1.0	1.0	1.2	1.2	0.53	0.00	0.00
Cumulative	0.6	1.6	2.6	3.8	5.0	5.53	0.00	0.00

Project Development Objective(s)

The objective of the proposed Project is to implement priority ecosystem-based marine conservation and climate adaptation measures to strengthen the climate resilience of the Belize Barrier Reef System.

Components

Component Name	Cost (US$ Millions)
Component 1: Improving the Protection Regime of Marine and Coastal Ecosystems	2.00
Component 2: Promotion of Viable Alternative Livelihoods	2.45
Component 3: Raising Awareness and Building Local Capacity	0.56
Component 4: Project Management, Monitoring and Assessment	0.52

Institutional Data

Practice Area / Cross Cutting Solution Area

Environment & Natural Resources

Cross Cutting Areas

[X] Climate Change

[ ] Fragile, Conflict & Violence

[ ] Gender

[ ] Jobs

[ ] Public Private Partnership

Sectors / Climate Change

Sector (Maximum 5 and total % must equal 100)

Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Agriculture, fishing, and forestry	General agriculture, fishing and forestry sector	77	100	5
Public Administration, Law, and Justice	Public administration-Agriculture, fishing and forestry	23	100	63
Total		100		

☐ I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this Project.

Themes

Theme (Maximum 5 and total % must equal 100)

Major theme	Theme	%
Environment and natural resources management	Climate change	40
Environment and natural resources management	Biodiversity	30
Environment and natural resources management	Environmental policies and institutions	20
Social protection and risk management	Natural disaster management	5
Environment and natural resources management	Other environment and natural resources management	5
Total		100

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes [ ]	No [X]
Does the project require any waivers of Bank policies?	Yes [ ]	No [X]
Have these been approved by Bank management?	Yes [ ]	No [ ]
Is approval for any policy waiver sought from the Board?	Yes [ ]	No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No [ ]

Safeguard Policies Triggered by the Project	**Yes**	**No**
Environmental Assessment OP/BP 4.01	X	
Natural Habitats OP/BP 4.04	X	
Forests OP/BP 4.36	X	
Pest Management OP 4.09	X	
Physical Cultural Resources OP/BP 4.11	X	
Indigenous Peoples OP/BP 4.10	X	
Involuntary Resettlement OP/BP 4.12	X	
Safety of Dams OP/BP 4.37		X
Projects on International Waterways OP/BP 7.50		X
Projects in Disputed Areas OP/BP 7.60	X	

Legal Covenants

Name	**Recurrent**	**Due Date**	**Frequency**

Subsidiary Agreement	**X**	31-Oct-2019	CONTINUOUS

Description of Covenant

As set forth in Schedule 2, Section I.A of the Grant Agreement, the Recipient shall make the proceeds of the Grant available to PACT under the Subsidiary Agreement, under terms and conditions approved by the World Bank.

Name	**Recurrent**	**Due Date**	**Frequency**
Implementation Arrangements	**X**	31-Oct-2019	CONTINUOUS

Description of Covenant

As set forth in Schedule 2, Section I.B of the Grant Agreement, the Recipient shall operate and maintain the Project Steering Committee, the Technical Advisory Committee, and the Project Implementing Agency Group (PIAG) within MFFSD throughout the duration of the Project.

Name	**Recurrent**	**Due Date**	**Frequency**
Sub-Projects	**X**	31-Oct-2019	CONTINUOUS

Description of Covenant

Detailed covenants describing sub-project award, screening, responsibilities and required terms of sub-project implementation agreements, as set forth in Section I.C. of Schedule 2 to the GA.

Name	**Recurrent**	**Due Date**	**Frequency**
Environmental and Social Safeguards	**X**	31-Oct-2019	CONTINUOUS

Description of Covenant

Detailed covenants setting forth safeguard requirements for the Project as set forth in Section I.D of Schedule 2 to the GA.

Conditions

Source Of Fund	**Name**	**Type**
Adaptation Fund	Subsidiary Agreement	Effectiveness

As set forth in Article V, 5.01 (b) of the Grant Agreement, the Subsidiary Agreement has been executed on behalf of the Recipient and PACT.

Source Of Fund	**Name**	**Type**
Adaptation Fund	Project Operational Manual	Effectiveness

Description of Condition

Adoption of the Project Operational Manual by the Recipient and PACT, satisfactory to the World Bank as set forth in Section I.B of Schedule 2 to the GA.

Team Composition

Bank Staff

Name	**Title**	**Specialization**	**Unit**
Enos E. Esikuri	Sr. Environmental Specialist	Team Leader	GENDR
Keiko Ashida Tao	Environmental Specialist	Climate Change Adaptation	GENDR
Michele Diez	Operations Officer	Marine Biology	GENDR
Tuuli Bernardini	Environmental Specialist	Environmental	GENDR

Kimberly Vilar	Social Development Specialist	Social Development	GURDR
Yingwei Wu	Sr. Procurement Specialist	Procurement	GGODR
David I	Sr. Financial Management Specialist	Financial Management	GGODR
Victor Manuel Ordonez Conde	Sr. Finance Officer	Finance	CTRLN
Tatiana Cristina de Abreu	Finance Analyst	Finance	CTRLN
Sofia De Abreu Ferreira	Counsel	Legal	LEGEN
Victor Bundi Mosoti	Sr. Counsel	Legal	LEGEN

Non Bank Staff

Name	Title	Office Phone	City

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
Belize	Corozal	Corozal District	x		
Belize	Cayo	Cayo District	x		
Belize	Belize	Belize District	x		
Belize	Toledo	Toledo District	x		

I. STRATEGIC CONTEXT

A. Country Context

1. Belize is a small, upper-middle income country with a population of 331,900 and a GDP per capita of US$4,834 (2013)[1]. The country is endowed with the largest barrier reef in the Americas and pristine tropical forests. Although the economy has traditionally been oriented towards agriculture, it has undergone a significant transformation over the last decade resulting from the first commercial oil discovery in 2005 and emergence of the tourism industry[2]. The service sector has become the largest contributor to GDP accounting for 54%, while the agricultural sector accounts for 13% of GDP with exports primarily dominated by the sugar and citrus industries[3].

2. Since gaining independence in 1981, Belize has experienced a peaceful and democratic transition. The governing party, United Democratic Party (UDP), came to power in 2008 and was re-elected in 2012 for a subsequent five-year term, which ensured political stability and continuity for policy priorities. The Government has worked to establish a transparent and accountable government and has taken concrete steps to address governance issues including the passage of the Freedom of Information Act, term limits for elected officials (including the Prime Minister), and empowering the Senate's oversight abilities. After suspending its program for several years due to deteriorating fiscal conditions and fiduciary concerns, the World Bank reengaged in 2009, through the preparation of the Interim Strategy Note (ISN) 2009-20114. Under this ISN, the Belize Municipal Development Project (BMDP) was approved by the Executive Directors on September 16, 2010. Since the approval of the BMDP and the successful implementation of the ISN, the relationship between the Bank and the Government of Belize (GoB) has improved and there is a clear commitment from the GoB to the lending and technical assistance programs outlined in the World Bank Group Country Partnership Strategy (CPS) FY2012-2015 (Report No. 63504-BZ, discussed by the Executive Directors on September 8, 2011).

3. Fiscal space remains limited in Belize and the public debt trajectory vulnerable to various shocks. The Belizean economy is estimated to have grown by only 0.7% in 2013 mainly because of continued decline in oil production and weak agricultural output, especially sugarcane and citrus. In March 2013, the GoB completed the restructuring of the US$550 million superbond[5] which was issued in the international market in 2007. Over the medium term, real GDP growth is expected to hover around 2.5% a year as declining oil production would be offset by higher output of other commodity exports, tourism and construction. The authorities' medium term policy plans would maintain the primary surplus around 1% of GDP, as in 2013, which could lead to significant increases in public debt as a share of GDP, especially when a court decision

[1] World Bank Development Indicators 2013.
[2] Total tourist arrivals reached 881,867 in 2013 compared to 216,932 in 2001. Source: Central Bank of Belize, Key Tourism Indicators 2001-2013.
[3] Central Bank of Belize, Economic Indicators 2001-2012.
[4] World Bank, "Interim Strategy Note for Belize", Report No. 47282-BZ, February 4, 2009.
[5] Superbond is the amalgamation of a series of bonds and loans that the government of Belize took out between 2002 and 2003.

calls for the payment of compensation to the former owners of the recently nationalized companies. There are risks of economic downturn as additional external vulnerabilities could arise from a protracted period of weak growth in advanced economies or complications with PetroCaribe financing[6]. The authorities have, however, been proactive in developing programs to manage the potential impact of these risks.

4. Poverty in Belize substantially increased in recent years, in part due to the stagnating economic situation and impact of natural disasters**.** GDP per capita remained virtually flat after 2003 because the economy grew close to –and at times even below– the annual rate of growth of the population, estimated around 2.5 percent. After a gradual decline in unemployment levels during the past decade, these figures increased drastically from 8% to 16% between 2008 and 2012. During the 2002-2009 period, the overall poverty rate increased from 34% to 42%, and extreme poverty[7] increased from 11% to 16%. Rising poverty has affected all districts; for example, poverty rates have more than doubled in the Corozal District, from 26% to 56%, and extreme poverty tripled from 6% to 21%. Corozal was also repeatedly impacted by hurricane and flooding, highlighting the population's vulnerability to disasters. As of 2009, income inequality also remains high with a Gini coefficient of 0.42, and the highest rate of economic inequality is concentrated among indigenous Mayan communities[8]. There is also clear evidence of a rural-urban divide driven by low education, low female labor participation and prevalence of ethnic minorities.

B. Sectoral and Institutional Context

5. According to the first National Inventory of Sources and Sinks of Greenhouse Gases required by the United Nations Framework Convention on Climate Change (UNFCCC), Belize is a net sink for greenhouse gases, i.e., it absorbs more than it emits. Yet, Belize is extremely vulnerable to the adverse impacts of climate change. Therefore, Belize's national objective is focused on identifying feasible adaptation options to address climate change impacts. Climate change related events have already begun to profoundly impact the country's geophysical, biological and socio-economic systems, which results in depleting national budgets. Belize is a country with extensive, low-lying, coastal areas vulnerable to climate related disasters such as tropical cyclones and flooding. Furthermore, the economy is small and concentrated with most centers of population located in the most vulnerable areas. The UNFCCC recognizes Belize as one of the most vulnerable countries to adverse impacts of climate change due to it: (i) possessing a long, low-lying coastline, (ii) consisting of 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 (iv) maintaining 17,276 km^2 of forest cover, each of which supports fragile ecosystems. Thus, the vulnerability of the country to the foreseeable adverse physical, environmental, and economic impacts of climate change indicates that priority attention must be

[6] *Petrocaribe* is an oil alliance of many Caribbean states with Venezuela to purchase oil on conditions of preferential payment.

[7] Extreme (or Indigent) poverty is defined as $ 2.74 per day ($1,000 per year) and moderate poverty by $ 4.65 per day ($1,700 per year). Source: Government of Belize and Caribbean Development Bank 2009 Country Poverty Assessment Final Report, August 2010.

[8] The extreme poverty rate in Toledo where Mayan communities are concentrated is 38% while the national average is 10% (2009).

directed towards the implementation of viable adaptation measures targeting the most vulnerable sectors and ecosystems of Belize.

6. Belize derives significant benefits from the ecosystem services generated by the coral reefs and mangroves. 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% of GDP in Belize (in the range of US$395–559 million per year) (WRI, 2008). 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 US$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. The Belize Barrier Reef not only supports vibrant tourism, fishing industries, and livelihoods for communities, but also shelters Belize's extensive coast from high velocity winds that cause erosion and coastal damage. According to the World Resources Institute's assessment in 2008, approximately two-thirds of the mainland coast is protected by coral reefs. The degree of protection varies with reef type, depth and distance from the 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 since waves have less chance to regenerate. (See Annex 2.) A study estimates that the economic losses associated with a 90% coral collapse in the Caribbean can be at between 9 and 12 billion dollars per year (Vergara et al., 2009).

7. While most nations and natural capital assets in the Latin America and Caribbean region are likely to be heavily impacted by climate change, Belize presents an early case of negative ecosystem-wide impacts on its coral reef induced by climate change related damages that are exacerbated by local stressors (e.g., sedimentation, nutrient pollution from agrochemicals, and unsustainable uses of reef resources). Of the ecosystems in Belize, the barrier reef ecosystem is assessed as being highly vulnerable and is identified as a "Critical Area for Conservation: [with] high species richness and potentially severe climate-induced destabilization.[9]" Several indicators support this: increasingly frequent and wide-scale bleaching events[10] throughout the Caribbean Region induced by gradual and consistent increases in sea surface temperatures; increasing ocean acidification; reduction of coral cover as a consequence; and reduction in fisheries annual catch. High sea surface temperature anomalies have significant impacts on coral reefs in the Caribbean, especially if no significant large-scale adaptation measures are undertaken. Optimal water temperatures for Caribbean corals range from 25°C to 29°C. There is some evidence that corals have the ability to adapt to higher temperatures if given enough time to adapt without other chronic stressors (e.g., overfishing, pollution, rapid coastal development, etc.).

8. The anticipated intensification and increase in the frequency of hurricanes threatens the survival of coral reefs. The frequency of occurrence of major hurricanes is indicative of a broader increase in average tropical cyclone wind speeds as sea surface temperatures rise, as well as a shift in the intensity distribution towards more Category 4 and 5 hurricanes. An analysis of the global tropical cyclone intensity data beginning in 1970 indicates an average increase in intensity of 6% for a 0.6°C SST increase. High-resolution climate models indicate a 2% intensity

[9] CATHALAC/USAID study of regional biodiversity and climate change, 2008.

[10] When corals are stressed by changes in conditions such as temperature, light, or nutrients, they expel the symbiotic algae living in their tissues, causing them to turn completely white.

increase when scaled for a 0.6°C SST increase, and potential intensity theory yields an increase between 2.7% and 5.3%. Hurricane events lead to disturbance and mortality of coral recruits through 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. Hurricanes cause a devastating reduction in live coral cover when they coincide with a bleaching event. It has been reported that a mass-bleaching event coinciding with hurricane Mitch in 1998 resulted in a 48% reduction in live coral cover across the Belize reef system (Handwerk et al., 2003).

9. Given Belize's location and vulnerability to climate change, one effective way of adapting to climate change is through the promotion of ecosystem-based adaptation measures that strengthen the resilience of the reef and associated habitats. An effective approach to protect corals is to strengthen and improve the overall health of the ecosystems associated with the coral reef. A recent study demonstrated that bleached corals recover to normal growth rates more quickly when they have clean water and plentiful sea life at their side (Carilli et al., 2009). Researchers found that following a major bleaching event, 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 waters and reef were relatively healthy. In comparison, those corals living with excessive local stresses, such as pollution, were not able to fully recover after eight years. Similarly, a study (Mumby, 2006) found that reefs in Belize with healthy populations of grazers (e.g., parrotfish and surgeonfish) were far more likely to recover from hurricane damage and achieve prior levels of live coral cover than reefs whose grazers had been overfished, the latter being far more likely to undergo a phase shift to an algal dominated reef. In a related study, Mumby et al, (2009) also found that reefs contiguous to healthy mangrove habitats were more likely to recover from environmental stress, demonstrating the importance of habitat connectivity in maintaining the health of the coral reef ecosystem. Therefore, adaptation measures for coral reefs must include broader management measures, such as controlling overfishing and associated ecological imbalances through the establishment of replenishment marine reserves as well as controlling land-based threats to reefs.

C. Higher Level Objectives to which the Project Contributes

10. The Project is highly relevant to the Belizean development context and the World Bank's twin goals to eliminate extreme poverty and boost shared prosperity by offering an innovative and integrated approach to developing adaptation options for addressing the impacts of climate change, with a focus not only on conservation of the natural capital, but also on supporting livelihoods of the affected poor communities who largely depend on natural resources and environmental services offered by marine and coastal ecosystems. The Project embodies the linkage between natural resource conservation and climate change adaptation on one hand and economic growth, jobs and poverty reduction on the other hand. The proposed Project is developed under the Bank's Country Partnership Strategy (CPS) for Belize for the period FY2012-2015 (Report No. 63504-BZ), discussed by the Executive Directors on September 8, 2011, which focuses on supporting the GoB in achieving "Inclusive and Sustainable Natural Resource-Based Growth and Enhanced Climate Resilience." Specifically, the Project would contribute to the CPS' *Results Area 3: Investment to strengthen climate resilience*, and its outcomes "Increased ecosystem resilience to climate change impacts" and "Strengthened legal and administrative framework for Protected Areas (PAs)."

11. The Project is aligned with the strategy of the National Poverty Elimination Strategy and Action Plan 2009-13 (NPESAP), specifically in (a) effective mitigation against the effects of climate change and natural disasters and (b) reduction in citizens' vulnerabilities to catastrophic disasters. In addition, a long-term development plan, Horizon 2030, describes the main Government priorities and challenges and highlights the central role of sustainable environment and natural resource management in the Belizean economy.

12. Belize is a signatory of the UNFCCC, ratified on October 31, 1994. The First National Communication to the UNFCCC (July 2002) states that Belize has been identified as one of the most vulnerable countries to the adverse impacts of climate change. Through its membership in the Caribbean Community (CARICOM), Belize is a partner in the Alliance of Small Island States (AOSIS). Belize is also a member of the Central American Commission on Environment and Development (CCAD). Belize ratified the Kyoto Protocol on September 26, 2003, making it eligible to access resources from the Adaptation Fund (AF). The AF was established to finance concrete adaptation projects and programs in developing countries that are Parties to the Kyoto Protocol and that are particularly vulnerable to the adverse effects of climate change.

13. Belize is also a signatory of the Convention of Biological Diversity (CBD), ratified on December 30, 1993. The proposed Project is fully aligned with Belize's National Biodiversity Strategy and Action Plan (NBSAP) submitted to the CBD, which promotes comprehensive use and management of Belize's biological resources. It is also aligned with the 2005 National Protected Areas System Plan (NPASP), which targets the enhanced management of PAs in accordance with recommendations from this plan and fulfils Belize's commitments to the CBD Program of Work on Protected Areas. Belize's sector-specific policies and legislation are generally comprehensive and robust, such as the 2009 Water Resources Management Act, the 1992 National Lands Act, and the 1999 Coastal Zone Management Act.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

14. The objective of the proposed Project is **to implement priority ecosystem-based marine conservation and climate adaptation measures to strengthen the climate resilience of the Belize Barrier Reef System**. Specifically, the Project will support: (i) improvement of the coral reef protection regime including an expansion and enforcement of the Marine Protected Areas (MPAs) and replenishment (no-take) zones in strategic locations to build climate resilience, (ii) promotion of sustainable alternative livelihoods and income diversification for affected users of the reef, and (iii) building local capacity and raising awareness regarding the importance of the overall health of the reef ecosystem to its climate resilience and, consequently to community welfare as well as the growth prospect of the country's economy.

B. Project Beneficiaries

15. The proposed adaptation, conservation, and restoration activities of the Belize Barrier Reef System have 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. The Project will build capacity for local communities, which are directly affected by the climate impacts, to act as champions of the marine managed areas and of the resources upon which they depend.

16. The main communities affected by the primary geographic focus of the Project are Corozal Town, Belize City, Dangriga, Consejo, Copper Bank, Chunox, Sarteneja, Hopkins, Sittee River, Riversdale, Seine Bight and Placencia. Of the twelve communities with direct connection to those targets, nine are considered rural, and four are inhabited primarily by the indigenous Garinagu people. There are varying degrees of dependence on the target MPAs by these communities' residents. The fishermen, from the village of Copper Bank, Chunox and Sarteneja, are likely to experience a greater degree of impact from the Project given their connection to all three target protected areas and marine reserves. These fishermen are from the Northern region of the country and have similarities in ethnic composition (Mestizos). The three indigenous communities, Dandriga Hopkins and Seine Bight, are connected mainly to the Southwater Caye Marine Reserve.

17. Poverty in fishing communities follows the national trend. The Country Poverty Assessment of 2010 shows that 55.3% of the rural population and 27.9% of the urban population are living below the poverty line. The fishing villages generally fit this characteristic. According to CARICOM regional study, about 45% of fishing households in Belize are poor or vulnerable to poverty. Of all the fishing villages that make up the study area, Sarteneja is relatively the most developed while also being the most dependent on fishing given their dominance of Belize commercial fishery. On the other hand, Hopkins and Placencia are more diversified from fishing. The urban areas of Corozal Town and Dangriga are fairly well developed compared to the villages, though there is a certain degree of poverty present.

18. At the household level, the Project will focus on the entire household unit. The Project's social assessment, conducted by the GoB, corroborated the women's central productive and socially reproductive roles in fishing households. In addition, given women's important role in sustainable resource use and conservation of biodiversity in Belize, CBD's guidance on gender would be followed, specifically: (i) Conference of the Parties (COP) Decision 1X/24 on the approval and endorsement of the CBD Gender Plan of Action; and (ii) COP Decision X/19, which amongst other matters invited Parties to consider gender as a core cross-cutting issue in the implementation of biodiversity-related activities.

C. PDO Level Results Indicators

- Marine areas brought under biodiversity protection (ha)
- Coastline brought under biodiversity protection (km)
- Direct Project beneficiaries who adopted alternative livelihoods (and diversified household income) (# of people), of which female (%)
- Change of attitude and/or behavior of targeted beneficiaries (%)

III. PROJECT DESCRIPTION

A. Project Components

19. **Component 1 – Improving the Protection Regime of Marine and Coastal Ecosystems (US$2 million):** This component is aimed at supporting the conservation of marine and coastal ecosystems in the territory of the Recipient by:

(1.1) Expanding and consolidating Selected Marine Protected Areas to achieve about 20.2% of area under protection and creating replenishment zones in Selected Marine Protected

Areas through: (i) spatially mapping and analyzing Selected Marine Protected Areas; (ii) field verification of spatial mapping activities under the Project; (iii) preparation of revisions to the zoning of Selected Marine Protected Areas based on Project field verification and consultation activities; (iv) finalizing zoning maps for Selected Marine Protected Areas and incorporating said maps in the respective management plans of the Selected Marine Protected Areas; and (v) re-demarcation of Selected Marine Protected Areas;

(1.2) Promoting effective management of Selected Marine Protected Areas, including its replenishment fishing zones through: (i) strengthening surveillance, monitoring and enforcement; and (ii) supporting biological and water quality monitoring;

(1.3) Supporting pilot investments to re-populate coral reefs within replenishment fishing zones through: (i) the establishment of coral nurseries within Selected Marine Protected Areas; and (ii) supporting coral out-planting; and

(1.4) Strengthening the Belize's legal framework for the management of marine protected areas and coastal zones through support for: (i) the review and reform of the Belize's legal and institutional framework for protected areas; (ii) the review of mangrove regulations; (iii) the review and reform of the Coastal Zone Management (CZM) Act; and (iv) the implementation of an Integrated Coastal Zone Management (ICZM) plan.

20. These are aligned with the key components of successful MPA management repeated in various MPA effectiveness studies (e.g., Alder et al., 1994; Neis, 1995; Sumaila et al., 2000; Christie et al., 2009). These efforts are crucial to reduction in key local stressors to the reef, which is important for enhancing the ecosystem's functionality, resilience and capacity to adapt to climate induced changes. Such stressors include: (a) overfishing and harmful fishing practices (e.g., gill nets, spear gun fishing, unregulated fish traps); (b) 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, (c) uncontrolled tourism expansion (e.g., cruise-ship industry, hotel construction) and associated unsustainable practices, pollution and pressures on the reef.

21. The major undertaking of this component is the expansion of MPAs from 13% to 20.2% (indicative) of territorial waters and Marine Replenishment (No-Take) Zones from approximately 2% to 3.1% (indicative) as identified in the NPASP in a participatory manner. The Project would also support the entire MPA network of Belize to improve its management effectiveness by strengthening the legal framework for the MPA network and implementing monitoring and compliance in the select MPAs. This will significantly enhance the ecosystems' functionality, resilience and capacity to adapt to climate induced changes. The specific emphasis would be on the area surrounding Turneffe Atoll, Southwater Caye Marine Reserve (SWCMR), Corozal Bay Wildlife Sanctuary (CBWS) and estuary lagoon systems. These three sites are critical in terms of the integrity and connectivity of marine ecosystem and climate impacts.

22. The Project would also support effective and participatory management of Belize's MPA network and the coastal zone, including the implementation of the ICZM Plan to increase protection of mangroves, seagrass, and tidal marsh areas. It aims to address the critical recommendations in the CZM Plan for the long-term development of all coastal areas, including development of small, climate vulnerable cayes and of cayes found inside marine reserves. It also entails the enforcement of a 66-foot buffer zone as a reserve for coastal development and prevention of erosion in the buffer zone.

23. **Component 2 – Promotion of Viable Alternative Livelihoods (US$2.45 million):** This component is aimed at promoting economically viable and sustainable alternative livelihoods for communities adversely impacted by climate change and by the expansion and consolidation of Marine Protected Areas and replenishment zones under the Project by, *inter alia*:

(2.1) Supporting community mobilization for the development of Alternative Livelihoods Subprojects through, undertaking community needs assessments and participatory workshops for Alternative Livelihoods Subprojects planning;

(2.2) Carrying out Alternative Livelihoods Subprojects; and

(2.3) Capacity building to transition to economically viable and sustainable alternative livelihoods through, providing business and occupational skills training.

24. This component will be implemented in direct partnership with co-managers of MPAs, local conservation NGOs, and fishing cooperatives and associations. The eligibility, eligible and ineligible expenditures, selection criteria, and process of Sub-projects will be clearly defined in the Project Operational Manual (POM) and made available for the target communities for transparency.

25. The promotion of alternative livelihoods would contribute to reducing the local anthropogenic stressors on the marine resource base and, in turn, to increasing the health of reefs and associated marine and coastal ecosystems, thus enhancing overall resilience of both human and ecological elements of the ecosystem to climate impacts. The preliminary targets for this component are the coastal communities whose livelihoods depend on the marine and coastal resources of Turneffe Atoll, Corozal Bay, and Southwater Caye as a principal source of income. The GoB has placed a very high priority on directly supporting measures for fishers, processors, those who engage in tourism, and indirectly many of the 105,000 people living in the target coastal areas of Belize. Many of these communities depend almost entirely on fishing for their livelihood. Other communities which used to engage in agricultural production have increasingly turned to fishing due to economic downturn in the agricultural sector.

26. **Component 3 – Raising Awareness and Building Local Capacity (US$0.56 million):** This component is aimed at raising awareness of the impacts of climate change and the value of marine conservation and building local capacity for the adoption of climate resilient practices by, among others, carrying out a climate change knowledge, attitude, and behavioral practice (KAP) survey, disseminating information about the Project, designing and implementing a coordinated behavior change communication strategy, and supporting inter-community learning and dialogue.

27. The objectives of this component are (i) to increase the understanding by local stakeholders about impacts of climate change and the value of marine conservation to build support for the National Protected Areas Policy and System Plan (NPAPSP) as a strategy to ensure the long term sustainability of natural resources; (ii) to build local capacity to develop and explore climate resilience strategies, and (iii) to provide regular and accessible public information on climate change effects in the marine ecosystems and coastal zone to promote behavior change designed to minimize climate risks in MPAs and replenishment zones.

28. **Component 4 – Project Management, Monitoring and Assessment (US$0.52 million):** This component is aimed at supporting: (a) Project management and implementation support including technical, administrative and fiduciary support and compliance with

environmental and social safeguards; and (b) monitoring and evaluation, data collection, and stakeholder involvement and coordination.

B. Project Financing

Lending Instrument

29. This Project would be funded by an Adaptation Fund (AF) grant in the amount of US$5.53 million and US$1.78 million in-kind contribution by the GoB. The AF was established to finance concrete adaptation projects and programs in developing countries that are parties to the Kyoto Protocol and are particularly vulnerable to the adverse effects of climate change. The Adaptation Fund covers the financing of full adaptation costs. The lending instrument would be an Investment Project Financing.

30. The Project activities would be supported by parallel financing from complementary investments under the CPS FY2012-2015, including Management and Protection of Key Biodiversity Areas Project (WB/GEF-P130474, US$6.0856 million), Promoting Sustainable Natural Resource-based Livelihoods Project (WB/Japan Social Development Fund-P132098, US$3 million), Climate Resilient Infrastructure Project (IBRD Loan-P127338, US$15 million, US$4 million of which will directly support some of the Project activities).

Table 1. Project Cost and Financing (US$ million)

Project Components	Total Project Cost	AF Financing	% Financing
1. Improving the protection regime of marine and coastal ecosystems	2.41	2.00	83
2. Promotion of viable alternative livelihoods	2.82	2.45	87
3. Raising awareness and building local capacity	0.56	0.56	100
4. Project management, monitoring and assessment	1.52	0.52	34
Total Financing required	**7.31**	**5.53**	**76**

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

31. **The Financial Secretary** of the Ministry of Finance and Economic Development (MFED) is the designated authority who is charged to endorse the proposed Adaptation Fund Project. **The Ministry of Forestry, Fisheries and Sustainable Development (MFFSD)** is responsible for the overall implementation of the Project with the fiduciary assistance of Protected Areas Conservation Trust (PACT). MFFSD houses key units for the implementation of the Project, including Fisheries Department, Coastal Zone Management Authority and Institute (CZMAI), and National Protected Areas Secretariat (NPAS). Particularly, Fisheries Department is responsible for capture fisheries, aquaculture, as well as MPAs, thus assumes the central role in implementing the proposed Project.

32. **The Project Steering Committee (PSC)** will support general Project strategic guidance and implementation oversight. The PSC will be chaired by the Chief Executive Officer (CEO) of the MFFSD, and comprised of representatives of key ministries/organizations including the MFED, CZMAI, NPAS, and PACT. **The Technical Advisory Committee (TAC)** will provide

general technical guidance for Project implementation, as further set forth in the Project Operational Manual (POM). The TAC is comprised of representatives from Fisheries Department, the Department of the Environment (DOE), Climate Change Office, Economic Development under the MFED, NPAS, and PACT.

33. **Project Implementing Agency Group (PIAG)** within MFFSD would carry out the day-to-day management of the Project and Sub-projects, including coordination, supervision, monitoring, quality control, socio-environmental management, and reporting in accordance with the Grant Agreement and the Project Operational Manual (POM). The PIAG will consist of a Project Coordinator, a Senior Technical Officer, staff from Fisheries Department, and fiduciary staff of PACT. PACT will be responsible for ensuring sound fiduciary management of the Project's resources. Funds will be transferred to PACT under a Subsidiary Agreement with the Government. No funds will flow directly to the Sub-project beneficiaries.

B. Results Monitoring and Evaluation

34. The MFFSD will be responsible for the overall monitoring and evaluation (M&E) of the Project through the PIAG. The M&E plan will form a part of the annual work plan of the PIAG. The M&E indicators, targets, data collection methodology, etc. are presented in Annex 1 Results Framework. M&E of Project implementation will be conducted through: (a) activities of the PIAG; (b) semi-annual progress reviews by the PSC and the TAC; (c) progress reviews during World Bank implementation support missions; (d) mid-term review of project implementation; and (e) terminal evaluation to be conducted jointly by the MFFSD/PIAG, the PSC, and the TAC. The Implementation Completion and Results Report (ICR) will be prepared within six months after closing of the Grant based on the terminal evaluation report prepared by the Government. There are gaps in terms of debt acquisition, archiving, and sharing to which the Project will make investments in strengthening the M&E in the sector.

C. Sustainability

35. The Project results are expected to be sustainable as the Project will address the core of the development challenge that Belize is facing. The conservation efforts proposed under Component 1 are based on the country's fisheries management strategy. Also, there is a strong sense of ownership that has been built among multiple governmental and non-governmental entities, including local communities who were involved in the design of the Project activities through culturally appropriate consultations. The Project will promote strong coordination among various departments/agencies through the PSC. The Project was designed taking into account these alliances in order to strengthen the capacity of the GoB while providing support to local communities and community-based organizations. The key implementation partners include: (a) Turneffe Atoll Sustainability Council; (b) Sarteneja Alliance for Conservation and Development; (c) Belize Fishermen's Federation; (d) Belize Fishermen's Cooperative Association; (e) Southern Environmental Association; and (f) Dangriga Fishermen's Association.

36. Financing of the recurrent costs of the expansion of MPAs is likely sustainable. PACT actually acts as the trust fund for PAs/MPAs in Belize and is regarded as a successful model in securing funds and supporting the management of PAs/MPAs. Also the GoB intends to implement relevant recommendations from the "Rationalization of National PAs System" study which include establishing a mechanism to source and manage finances additional to the

government budget. Such potential mechanism includes a Debt-for-Climate Adaptation-Swap scheme[11].

37. All of the measures proposed under the Project are in line with the World Bank/Belize CPS and complementary to various projects under the CPS, thus outcomes from the Project have more sustainability potential. Also, the GoB is committed to improve the macro-fiscal environment, particularly through sound debt management and financial sector reform. In this context, the proposed Project will focus on site-specific, bottom-up measures for long-term sustainability of biodiversity and building resilience against climate change impacts. These Project interventions would be assessed and replicated or scaled up where possible in future projects.

V. KEY RISKS AND MITIGATION MEASURES

A. Risk Ratings Summary Table

Stakeholder Risk	Moderate
Implementing Agency Risk	
1. Capacity	Moderate
2. Governance	Moderate
Project Risk	
3. Design	Moderate
4. Social and Environmental	Moderate
5. Program and Donor	Low
6. Delivery Monitoring and Sustainability	Moderate
Overall Implementation Risk	Moderate

B. Overall Risk Rating Explanation

38. The overall risk is rated as moderate given that the country status is stable and the PACT has extensive experience in grant management, resource mobilization and fiduciary management for the National Protected Areas Secretariat. MFFSD and PACT are also the implementing agency/fiduciary agent for the Belize Management and Protection of Key Biodiversity Areas Project (P130474) supported under the CPS. The key risk is low capacity in the Project implementing entities and community organizations, as well as coordination between these players. The Project is mitigating this risk through training and strengthening the technical capacity. In addition, the Project includes a participatory and consultative process with different stakeholders (including communities and NGOs) and will be implemented in a similar manner across organizations to ensure close coordination.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analyses

39. The economic analysis focuses on Components 1 and 2 given the difficulty in quantifying the effects of increased awareness (see Annex 6). For Component 1, attention is given on the

[11] Mechanism by which debt owed by a debtor, can be renegotiated with the creditor to fund activities agreed by all stakeholders involved (conservation, health, others)-(The Nature Conservancy).

benefits and costs of creating the MPA at Turneffe and improving management effectiveness at SWCMR and CBWS. Quantifying the effects of efforts to improve the management effectiveness of MPAs across Belize is difficult, hence the analysis conservatively assumes that the only benefits afforded by the Project are in Turneffe, SWCMR and CBWS.

40. In sum, the selected benefits exceed costs for different discount rates applied (4%, 10% and 20%). In terms of benefit break-even, if the only benefits realized by Component 1 are those associated with coral reefs on Turneffe, benefits will cover the costs of Component 1. Also, it is concluded that preserving reefs and mangroves is cost effective even if they offer only 1/20th of the shoreline protection offered by levees. Also Component 2 is worth undertaking even if the benefits are slightly lower than the conservative estimates. This is true even in the strictest case of the shorter time horizon and the highest discount rate, where long-run recovery of the fishery has not had much time to take place and fewer fishers and processors have transitioned into higher-valued occupations.

B. Technical

41. The proposed Project embodies a two-track approach which combines ecosystem-based adaptation with improving enabling policy 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, a slight reduction from the current greenhouse gas (GHG) concentration level of 388 ppm (2010) to 350 ppm is necessary, 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 PAs that include different parts of the reef system as well as areas critical for future reef replenishment. Thus, this proposed Project 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.

42. Investing in measures that protect and improve the ecological health of the natural ecosystems (such as mangroves and coral reefs) is indeed a viable and cost-effective adaptation strategy in the face of limited resources and increasing climate change impacts. While globally there has previously been heavy emphasis on engineering approaches (e.g., dikes, storm shelters, building codes, 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 initially thought. Such ecosystem-based adaptation measures have little or no risk of mal-adaptation, provide multiple co-benefits, and may in fact be more cost effective. A very rigorous data-rich analysis by Saudamini Das (2007)[12] established that mangroves were highly effective in reducing human death, livestock loss and house damages during the 1999 Super Cyclone in Orissa, India. Human death toll would have been nearly doubled in the absence of mangroves. 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 strategy to adapt to

[12]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.

climate change. Furthermore, barrier reefs shelter coastal zones from intense tropical storms and high velocity winds that cause erosion and coastal damage as discussed earlier (see Section I. A).

43. Reducing the fishing pressure by enforcing replenishment zones and MPAs would immediately have a positive impact on the reef ecosystem, allowing it to maintain and strengthen its health to become resilient to climate change impacts. One of the key local stressors to the reef is overfishing 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 spiny lobster (*Panulirusargus*) which is also important for the health of corals because it preys on coral predators such as snails and fire-worms. 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 as global temperatures increase. Disease resistance in corals by increasing healthy colonies is an important aspect of climate adaptation. Replenishment areas tend to have fewer of disease-spreading fish such as *Stegastes*, likely because of greater abundance of its predators (e.g., groupers). The proposed Project sites 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.

44. The proposed Project's adaptation measures would complement and specifically mainstream climate change adaptation into the on-going activities by the GoB and other funding sources aimed at marine and coastal conservation. 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. The proposed activities would specifically address the key adaptation measures identified in Belize's First and Second National Communications to the UNFCCC, particularly enforcement of conservation and sustainable use of marine and terrestrial ecosystems, establishment and management of protected areas, inclusion of biodiversity conservation into sectoral adaptation strategies, and creation of alternative livelihoods away from coastal systems, which need to be urgently undertaken.

C. Financial Management

45. The financial management (FM) functions for this proposed Project will be solely handled by the Protected Areas Conservation Trust (PACT), acting as the fiduciary agent on behalf of the Recipient. No funds will flow to the sub-project beneficiaries. The FM inherent and control residual risks will bemoderated by PACT, with Bank's support, completing a time-bound action plan to mitigate risks. The Bank assisted in the preparation of an FM Chapter in the Project Operational Manual (POM). Periodic desk reviews and comprehensive risk based on-site FM implementation support will be conducted with a governance and anti-corruption (GAC) approach, being alert on FM red flags, highlighting areas for improvements, and providing support to have all instances expeditiously resolved and closed (see Annex 3).

D. Procurement

46. An assessment under the Bank's Procurement Risk Assessment and Management System (PRAMs) was conducted on PACT as the sole fiduciary agency to implement procurement actions for the proposed Project. Procurement for the proposed Project would be carried out in

accordance with the World Bank's "Guidelines: Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers", dated January 2011, revised July 2014; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers", dated January 2011, revised July 2014; and the provisions stipulated in the Grant Agreement. Various items under different expenditure categories are described generally in Annex 3. For each contract to be financed by the Grant, the different procurement methods or consultant selection methods, the need for prequalification, estimated costs, prior review requirements, and time frame are agreed between the Grant Recipient and the World Bank in the Procurement Plan (PP). The PP will be updated at least annually or as required to reflect the actual Project implementation needs and improvements in institutional capacity. The procurement procedures and standard bidding documents (SBDs) to be used for each procurement method, as well as model contracts are posted on the web site worldbank.org (see Annex 3).

E. Social (including Safeguards)

47. The Project focuses on generating conditions for long-term benefits, however monitoring and MPA compliance activities could also potentially result in involuntary restrictions of sections of MPAs that are currently used by local communities. For that reason, Involuntary Resettlement (OP/BP 4.12) and Indigenous Peoples (OP/BP 4.10) are triggered. Under OP 4.12, a Process Framework has been prepared and disclosed in country and on the World Bank's web site on November 14, 2014. Its purpose is to establish guidelines for the Project's livelihood restoration and diversification strategy under Component 2 to mitigate the impacts of restrictions on livelihood activities in target sites. In order to mitigate a range of social risks and to prevent, manage and resolve potential disputes, a Project-wide grievance redress mechanism has been established and described in the Process Framework.

48. The GoB also prepared and disclosed an Indigenous Peoples Plan (IPP also known as Culturally Appropriate Consultation and Participation Plan) in country and on the World Bank's web site on November 14, 2014 in full compliance with OP 4.10. The Plan includes a summary of the Project's social impact assessment, description of stakeholder consultations, analysis of the Project's potential social impacts and mitigation measures, culturally appropriate consultation protocol, steps for livelihoods restoration and diversification, and the grievance redress mechanism. The Plan establishes the measures through which the GoB will engage with the indigenous Garinagu and Mestizo fishing communities who are affected by the Project in culturally appropriate ways, according to their own governance structures, language preferences and traditions, and ensures that the eligibility criteria used to allocate benefits under Component 2 are culturally appropriate and fully inclusive of the country's culturally diverse communities. A series of consultations were held in country with representatives of all project stakeholders, in various locations, during project preparation.

F. Environment (including Safeguards)

49. The Project is classified as Category B according to OP/BP 4.01 on Environmental Assessment and requires a partial Environmental Assessment (EA). Its main expected environmental impacts are positive as presented along the PAD. The Project also triggers Natural Habitats (OP/BP 4.04), Forests (OP/BP 4.36), Pest Management (OP 4.09), and Physical Cultural Resources (OP/BP 4.11) to secure an integrated socio-environmental approach through the Project activities. The Project aims at improving livelihoods of local communities whose

economic activities are directly impacted by the adverse effects of climate change and expansion of the replenishment zones and MPA network. Socio-environmental management of Project activities is required due to potential small-scale adverse environmental impacts on human populations or environmentally sensitive areas. The same will be readily mitigated as they are likely to be site-specific and reversible. The exact location and nature of small investments to be financed under the Project will only be determined through a demand-driven process during implementation. Hence, the GoB has prepared an Environmental Management Framework (EMF) to conform to the environmental safeguard policies triggered by the Project and the applicable national regulations. The draft EMF was consulted with Project stakeholders on September 26, 2014 in Belize City. The final EMF was disclosed in-country and on the World Bank's web site on November 14, 2014.

G. Others (including Safeguards)

50. Projects under Disputed Areas OP/BP 7.60. This policy is applicable to the proposed Project because of the longstanding territorial dispute between Belize and Guatemala. Some of the six geographical areas that have been identified and prioritized for the proposed activities under the Project fall within the general area known to be in dispute. The proposed Project does not prejudice the position of either the Bank or the two countries involved. It is emphasized that by supporting the Project, the World Bank does not intend to make any judgment on the legal or other status of the territories concerned or to prejudice the final determination of the parties' claims. In line with OP/BP 7.60, the World Bank has ensured compliance with the requirements of the policy. The Bank has determined that given that the Project activities entail capacity building and small-scale community driven sustainable forest management practices and improvements to the management of protected areas, the Project is not harmful to the territorial interests of Guatemala.

Annex 1: RESULTS FRAMEWORK AND MONITORING

Country: Belize

Project Name: Marine Conservation and Climate Adaptation Project

Project Development Objective (PDO): To implement priority ecosystem-based marine conservation and climate adaptation measures to strengthen the climate resilience of the Belize Barrier Reef System.

PDO Level Results Indicators*	Core	Unit of Measure	Baseline	Cumulative Target Values**					Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition, etc.)
				YR 1	YR 2	YR3	YR 4	YR5				
Indicator One: Marine areas brought under biodiversity protection (ha)	☒	Hectares	MPAs: 248,810; Replenishment zones: 38,278	MPAs: 248,810; Replenishment zones: 38,278	MPAs: 248,810; Replenishment zones: 38,278	MPAs: 386,612; Replenishment zones: 59,331	MPAs: 386,612; Replenishment zones: 59,331	MPAs: 386,612; Replenishment zones: 59,331	Annually	GoB Gazette	MFFSD	
Indicator Two: Coastline brought under biodiversity protection (km)	☒	km; ha	0; 74, 480 (2012)	0; 74,480		386; 74,480		386; 74,480	Mid and end of Project	CZMAI report / Satellite date	MFFSD	No net loss of current mangrove forests (ha)
Indicator Three: Direct project beneficiaries who adopted alternative livelihoods (and diversified household income) (# of people), of which female (%)	☒	Number of people; %	Survey conducted in YR1	0; 0	500; 5	1500; 10	2000; 20	2500; 30	Annually	Annual Report / Sub-project reports	MFFSD	Direct beneficiaries are who have adopted alternative livelihoods and reduced dependency on fishing for household income.
Indicator Four: Change of attitude and/or behavior of targeted beneficiaries (%)	☐	%	0	0	0	25	50	75	End of Project	KAP	MFFSD	% of people surveyed
INTERMEDIATE RESULTS												
Intermediate Result (Component 1: Improving the Protection Regime of Marine and Coastal Ecosystems)												
Intermediate Result Indicator 1.1 The target MPAs are effectively managed as recorded by the Management Effectiveness Tracking Tool (METT)	☐	Management effectiveness score as recorded by METT (1-4)	TAMR - nil; CBWS -2.16; SWCMR - 2.65 (2009)	2.65; 2.16; --		3.5; 3.5; 3		3.5; 3.5; 3.5	Mid-term and end of Project	METT	MFFSD	
Intermediate Result Indicator 1.2 At least 3 restored coral sites,		Number of	0	0	3	3	6	6	Annually	Annual report	MFFSD	

with resilient varieties grown in coral nurseries, within TAMR and SWCMR (with each site measuring 300 m^2)		restored coral sites										
Intermediate Result Indicator 1.3 Coastal developments adhering to the development guidelines set by the ICZM Plan		% of develop-ments	0	0	10	50	50	75	Annually	CZMAI's monitoring reports	MFFSD	
Intermediate Result (Component 2: Promotion of viable alternative livelihoods for affected users of the reef)												
Intermediate Result Indicator 2.1 Alternative livelihoods Sub-projects developed	☐	Number of business plans	0	3	10	17	19	20	Annually	Annual report	MFFSD	
Intermediate Result Indicator 2.2 Persons participating in training based on training needs assessment and % of trainees are women;	☐	Number of persons; % of female trainees	0; 0	200; 30	1000; 30	1500; 30	1800; 30	2000; 30	Annually	Annual report	MFFSD	
Intermediate Result (Component 3: Raising awareness and building local capacity)												
Intermediate Result Indicator 3.1 Behavior change communication (BCC) campaigns conducted at all the target fishing communities	☐	Number of target communities	0	0	5	5	12	12	Annually	Annual report	MFFSD	

Annex 2: DETAILED PROJECT DESCRIPTION

BELIZE: Marine Conservation and Climate Adaptation Project

A. Global and Regional Climate Change Impacts

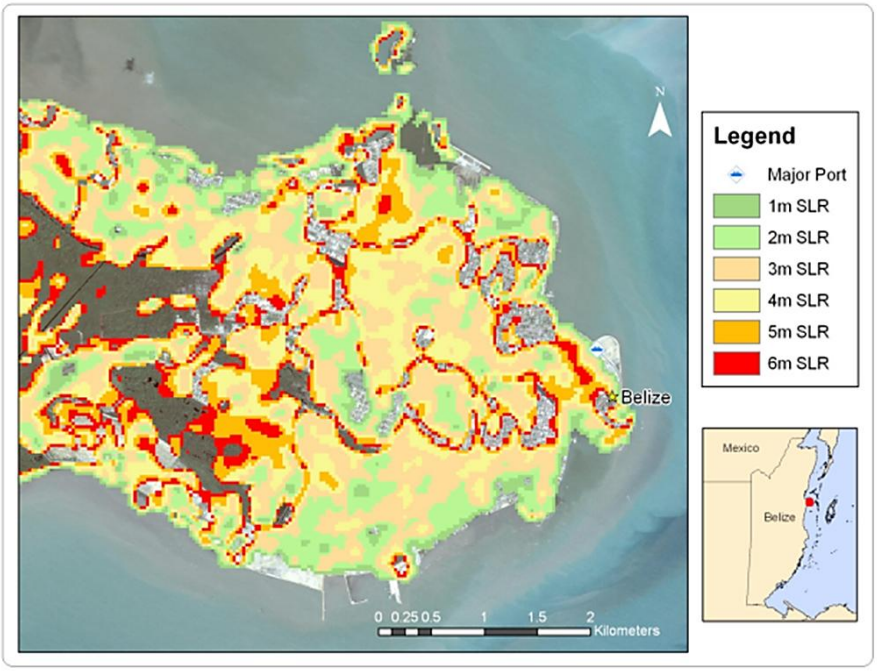
1. Global climate change remains arguably the most serious challenge to the development aspirations of the CARICOM countries. Observational data for the Caribbean already indicates an approximate increase in sea surface temperature of about 0.6°C above the global mean temperature in the 20th century. At the same time, mean sea level rose over the past century between 2 and 6 mm/year. These countries have been affected by increase in extreme precipitation, hurricanes, and flooding. 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. 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 (SLR) 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 Inter-governmental Panel on Climate Change (IPCC) Fifth Assessment Report (2014) projects that these phenomena will likely to continue with high confidence. 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). In all countries a high percentage of the population and much critical infrastructure are located along the coast[13]. These factors will be exacerbated by the projected adverse effects of climate change.

2. Indeed recent climate trends and projections of future climate for Belize indicate that climate change will exert increasing pressure on Belize[14]: (a) **Temperature**: Mean annual temperature has increased by 0.45°C since 1960, with an average rate of 0.10°C per decade. The average rate of increase is most rapid in the wet seasons (May-June-July and August-September-October) at 0.14-0.15°C per decade and slower in the dry seasons (November-December-January and February-March-April) 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°C by the 2090s; (b) **Precipitation**: Mean annual rainfall over

[13] See the First National Communication to the UNFCCC sub mitted by CARICOM countries.
[14] McSweeney, C., M. New & G. Lizcano. 2008. Belize: UNDP Climate Change Country Profile. University of Oxford, UK.

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 0.43 m under SRES B1, 0.21 to 0.53m under SRES A1B, and 0.23 to 0.56m under SRES A2.

Figure 2.1: Vulnerability of Belize City to Combined SLR and Storm Surge[15]



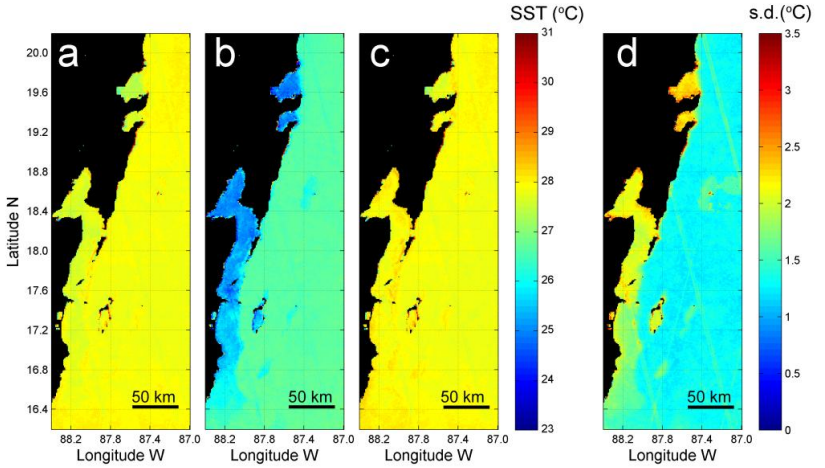
3. Belize's long low-lying coastal areas are especially vulnerable to more intense and frequent tropical storms and hurricanes, flood damage, and rising sea levels. Like the rest of the Caribbean, Belize has experienced frequent natural disasters of catastrophic proportions, and most recently suffered the impact of a Category 1 hurricane (Richard in October 2010) and

[15] Simpson, M.C., 1,2 Scott, D., 2,3 Harrison, M., 4 Silver, N., 5 O'Keeffe, E., 6 Sim, R., 3 Harrison, S., 4 Taylor, M., 7 Lizcano, G., 1 Rutty, M., 3 Stager, H., 2,3 Oldham, J., 3 Wilson, M., 7 New, M., 1 Clarke, J., 2 Day, O.J., 2 Fields, N., 2 Georges, J., 2 Waithe, R., 2 McSharry, P. 1 (2010) Quantification and Magnitude of Losses and Damages Resulting from the Impacts of Climate Change: Modelling the Transformational Impacts and Costs of Sea Level Rise in the Caribbean (Summary Document), United Nations Development Programme (UNDP), Barbados, West Indies.

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.

Figure 2.2: 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)

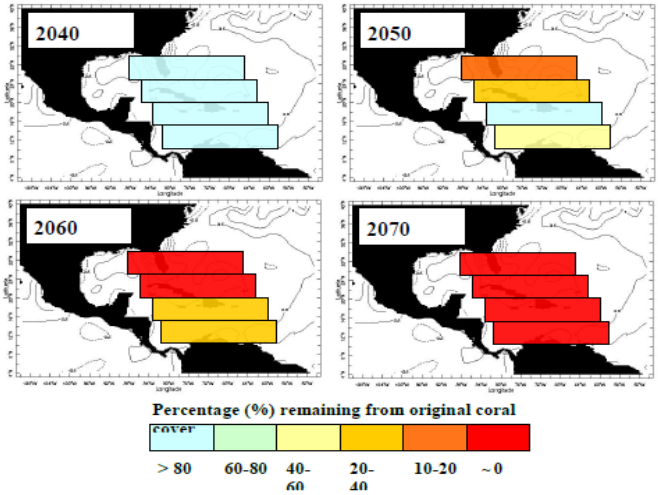
4. Of the ecosystems in Belize, the barrier reef is assessed as being highly vulnerable and identified as a "Critical Area for Conservation: [with] high species richness and potentially severe climate-induced destabilization."[16] Several indicators attest to this: severe coral mortality induced by warmer sea surface temperatures (Figure 2.2) and increasing ocean acidification; reduction of coral cover; and reduction in fisheries annual catch[17]. While some of these indicators respond to local stressors (e.g., sedimentation, nutrient pollution from agrochemicals, overfishing, etc.), they are all exacerbated by the consequences of global warming. 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).

5. 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

[16] From CATHALAC/USAID study of regional biodiversity and climate change, 2008.
[17] It is estimated that between 60 to 70 endemic species of corals in the Caribbean are endangered.

adaptation measures are undertaken[18]. Figure 2.3 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 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 replenishment marine reserves, as well as controlling land-based threats to reefs.

Figure 2.3. 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.

6. 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% intensity increase when scaled for a 0.6°C SST increase, and potential intensity theory yields an increase between 2.7% and 5.3%.[19]

7. 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

[18] 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.
[19] 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.

ephemeral bloom of blue-green and filamentous green algae may also create further stress.[20] 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% 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[21].

8. 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.[22] The economic losses associated to 90% coral collapse in the Caribbean have been estimated at between 9 and 12 billion dollars per year (Vergara et al., 2009).

9. 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.

10. The Belize Barrier Reef and mangrove systems not only supports vibrant tourism and fishing industries, but also shelters Belize's coast from 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% of GDP in Belize. According to the World Resources Institute (WRI 2009), about two-thirds of the mainland coast is protected by coral reefs.

Table 1: Reef or Mangrove Protected Shoreline for Belize

[20]Mumby, P. J., "Bleaching and hurricane disturbances to populations of coral recruits in Belize", *Marine Ecology Progress Series*, Vol. 190, 27-35, December 1999.

21 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

22Hoegh-Guldberg*et al.*, "Coral Reefs under Rapid Climate Change and Ocean Acidification", Science 14 December 2007: 1737-1742.

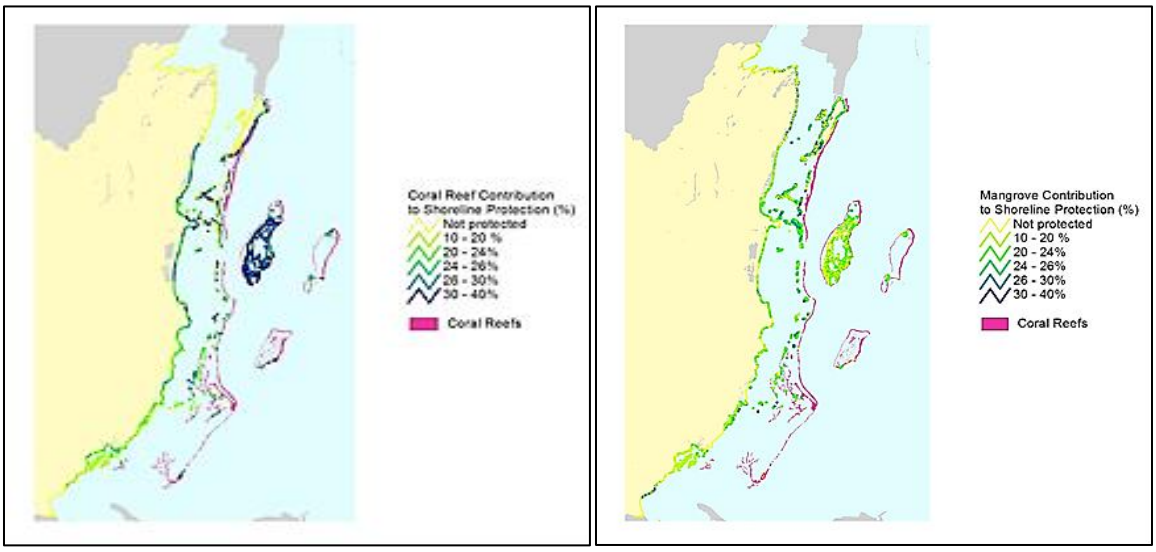
Location	Coastline length (km)	Reef-protected coast (km)	Percent protected	mangrove-protected coast (km)	Percent protected	Reef and mangrove-protected coast (km)	Percent protected
Mainland	**518**	**342**	**66%**	**260**	**50%**	**189**	**37%**
Offshore	1,288	928	72%	972	75%	690	54%
Total	1,805	1,270	70%	1,232	68%	879	49%

Note:Study focused on vulnerable land within 1 km of the coast, and on mangroves within the same 1 km coastal buffer.

Source: Cooper E, Burke L, and Bood N. (2009) "Coastal Capital: Belize. The economic contribution of Belize's coral reefs and mangroves." WRI working Paper. World Resources Institute, Washington, DC. 53p.

11. Where reefs protect the shoreline, they can contribute between 12 and 39% of the shoreline stability. Where mangroves are present, they contribute between 10 and 32% of shoreline stability. 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 reef off Ambergris Caye, for example, contributes about 40% 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% of the mainland's coastline and 75% of the cayes' shoreline.

Figure 2.4: Share of Protection Attributed to Reefs or Mangroves for each Segment of Shoreline



Source: Cooper E, Burke L, and Bood N. (2009) "Coastal Capital: Belize. The economic contribution of Belize's coral reefs and mangroves." WRI working Paper. World Resources Institute, Washington, DC. 53p .

12. Given 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 (i.e. ecosystem-based adaptation is the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help communities adapt to the adverse impacts of climate change). For example, 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 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[23].

13. In addition to the adaptation benefits, there are direct co-benefits associated with ecosystem-based adaptation measures with regard to GHG 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 (Crooks *et al.*, 2011). 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 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).

B. Project Development Objective

14. The objective of the Project is to implement priority ecosystem-based marine conservation and climate adaptation measures to strengthen the climate resilience of the Belize Barrier Reef System. Specifically, the Project will support:

1. Improvement of the coral reef protection regime, including an expansion and enforcement of the marine protected areas (MPAs) and replenishment zones in strategic locations to build climate resilience;
2. Promotion of viable and sustainable alternative livelihoods and income diversification for affected users of the reef; and
3. Building local capacity and raising awareness regarding the overall health of the reef ecosystem and the climate resilience welfare.

23Carilli 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.

C. Project Components

Component 1. Improving the Protection Regime of Marine and Coastal Ecosystems (US$2 million):

15. This component is aimed at supporting the conservation of marine and coastal ecosystems in the territory of Belize by, *inter alia*:

(1.1) Expanding and consolidating Selected Marine Protected Areas to achieve about 20.2% of area under protection and creating replenishment zones in Selected Marine Protected Areas through, *inter alia*: (i) spatially mapping and analyzing Selected Marine Protected Areas; (ii) field verification of spatial mapping activities under the Project; (iii) preparation of revisions to the zoning of Selected Marine Protected Areas based on Project field verification and consultation activities; (iv) finalizing zoning maps for Selected Marine Protected Areas and incorporating said maps in the respective management plans of the Selected Marine Protected Areas; and (v) re-demarcation of Selected Marine Protected Areas;

(1.2) Promoting effective management of Selected Marine Protected Areas, including its replenishment fishing zones through, *inter alia*: (i) strengthening surveillance, monitoring and enforcement; and (ii) supporting biological and water quality monitoring;

(1.3) Supporting pilot investments to re-populate coral reefs within replenishment fishing zones; (ii) the establishment of coral nurseries within Selected Marine Protected Areas; and (iii) supporting coral out-planting; and

(1.4) Strengthening the Belize's legal framework for the management of marine protected areas and coastal zones through support for, *inter alia*: (i) the review and reform of the Belize's legal and institutional framework for protected areas; (ii) the review of mangrove regulations; (iii) the review and reform of the CZM Act; and (iv) the implementation of an ICZM plan.

16. These are aligned with the key components of successful Marine Protected Areas (MPA) management repeated in various MPA effectiveness studies (e.g., Alder et al., 1994; Neis, 1995; Sumaila et al., 2000; Christie et al., 2009). These efforts are crucial to reduction in key local stressors to the reef, which is important for enhancing the ecosystem's functionality, resilience and capacity to adapt to climate induced changes. Such stressors include: (a) overfishing and harmful fishing practices (e.g., gill nets, spear gun fishing, unregulated fish traps); (b) 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, (c) uncontrolled tourism expansion (e.g., cruise-ship industry, hotel construction) and associated unsustainable practices, pollution and pressures on the reef.

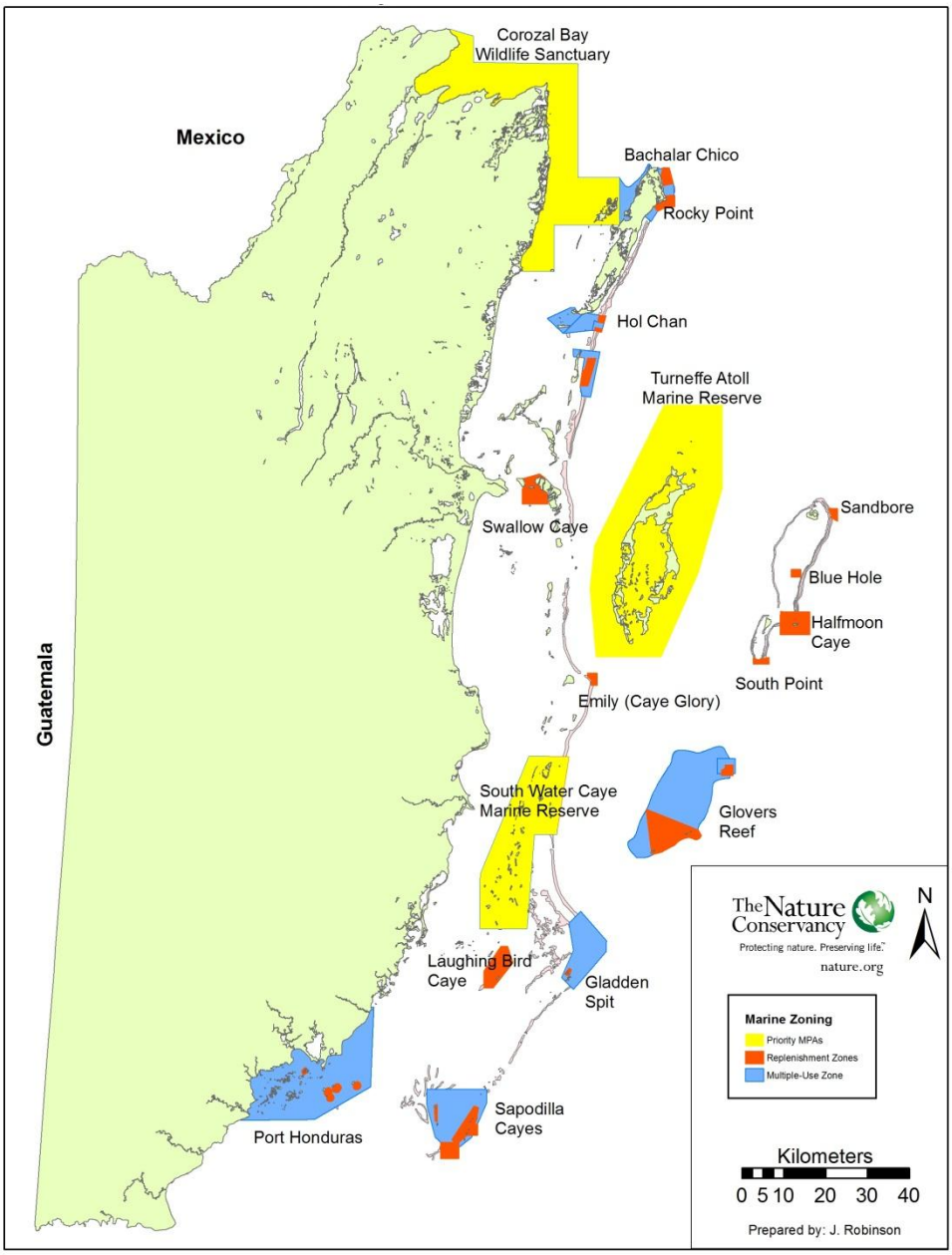
17. The major undertaking is expanding and securing MPA from 13% to 20.2% (indicative) of territorial waters and Marine Replenishment (No-Take) Zones from approximately 2% to 3.1% (indicative)[24] as identified in the NPASP. The Project would also support the entire MPA network of Belize to improve its management effectiveness by strengthening the legal

[24]The percentage represents the proposed areas surrounding Turneffe based on discussions with the local stakeholders. See Map 2.

framework for the MPA network, enhancing the enforcement, and implementing a comprehensive monitoring protocol. This will significantly enhance the ecosystems' functionality, resilience and capacity to adapt to climate induced changes. The specific emphasis would be on the area surrounding Turneffe Atoll, Southwater Caye Marine Reserve, Corozal Bay Wildlife Sanctuary and estuary lagoon systems. (See Map 1) The selection of the three MPAs to be targeted by the Project is based on the Government's protected areas (PA) rationalization exercise, which aims to provide recommendations for "building on the current network of protected areas, improving functionality, connectivity and socio-economic benefit as Belize moves into a future with increasing anthropogenic pressures, overshadowed by the need to adapt to current and predicted climate change impacts[25]." These three MPAs are critical in terms of the integrity and connectivity of marine ecosystem and climate impacts. Relative shoreline stability is high in areas with mangroves and coral reefs close to the shore and in areas well protected by multiple lines of defense, such as in Turneffe Atoll and South Water Caye. By preserving the reefs in these areas would contribute to the stability of at least 200km of the mainland coastline. The reefs in these areas are estimated to contribute to 24 – 40% of the shoreline stability. Mangroves are also vitally important to the stability of the shoreline of mainland and cayes throughout Belize. Figure 2.4 indicates that the coastline of Corozal Bay is highly stabilized by the presence of mangroves (24 – 40%)[26]. Warmer waters and more frequent thermal anomalies have been observed especially in areas of slow flow, as in the South Water Caye area, and in shallow and sheltered regions on the internal side of Corozal Bay and Turneffe lagoons. Also, the Turneffe Atoll area serves as a major source of coral larvae. Transport of coral larvae is driven by the general pattern of currents in the area, with most of the connections between pairs of reefs running parallel to the coastline. The west to southwest area of Turneffe towards Southwater Caye represents the highest number of connections. (P. Mumby et al, 2009). In addition, the benefits of storm protection and damages avoided by safeguarding these areas are substantial. The target areas, especially Turneffe, harbor significant mangroves, littoral forests, and lagoon systems which are underrepresented in the current system. Based on a 25 year major storm event, the annualized value of storm protection and damages avoided by Turneffe Atoll is US$38 million (A. Fedler, 2011). Furthermore, by including the identified fish spawning sites, resilient coral reef sites and climate refugia, climate-resilient stocks are secured within these sites. The Turneffe area includes at least three identified spawning aggregations which would be buffered by the marine reserve and significant reef flats which are key habitats for the valued catch and release species – bone fish, tarpon and permit. 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.

[25]Source: Rationalization Exercise of the Belize National Protected Areas System (Draft) (Wildtracks, August 2012)
[26]Cooper E, Burke L, and Bood N. (2009) "Coastal Capital: Belize. The economic contribution of Belize's coral reefs and mangroves." WRI working Paper. World Resources Institute, Washington, DC. 53p.

Map 1. Priority Marine Protected Areas



18. **Sub-component 1.1. Expansion and consolidating Selected MPAs to achieve about 20.2% of area under protection and creating replenishment zones in Selected MPAs.** The Project will target Turneffe Atoll Marine Reserve (TAMR), Corozal Bay Wildlife Sanctuary, and the South Water Caye Marine Reserve, as these sites are critical in terms of the integrity and connectivity of marine ecosystem and climate impacts. Turneffe Atoll was legally declared a marine reserve (November 2012) during the preparation of this Project. By its designation,

Belize's MPAs system has been expanded to about 20% of Belize's territorial sea. The Project will refine and demarcate the newly designated boundary. The Project will also support an expansion of the Corozal Bay Wildlife Sanctuary (CBWS) and realignment of fully-protected (non-extractive) zones for Turneffe Atoll Marine Reserve, South Water Caye Marine Reserve and Corozal Bay Wildlife Sanctuary to obtain a national increase of fully protected replenishment zones from an existing 2% to 3.1% of Belize's territorial sea. The Project will achieve these through:

Activity 1.1.1. Spatially mapping and analyzing Selected Marine Protected Areas. Geographic Information Systems (GIS) and remote sensing tools will be sourced and used to spatially map and analyze the targeted MPAs boundaries' expansion and realignment. Corozal Bay Wildlife Sanctuary (CBWS), in particular, will be re-mapped as recommended in the National Protected Areas Rationalization report to include part of the northern coastal lagoon system and saline savannah. The overall expansion or refinement process for the targeted MPAs will take into strong consideration the inclusion of such ecosystems as rapidly disappearing littoral forest and beach vegetation, some national cayes (particularly national cayes and inundated mangroves on Turneffe) that through research and monitoring have been found to exhibit crucial structural components that allow for quick recovery or resilience to climate disturbances (e.g., increased sea surface temperatures), and refugia-areas that experience less change than others. Protection of functional groups, keystone species, and representative habitats (e.g., coral reefs across depth gradient, mangroves, seagrass beds, lagoon systems, and fish spawning aggregation sites) will be prioritized. Major features will be highlighted that could promote the replenishment of fisheries and restoration of ecosystem balance.

Activity 1.1.2. Field verification of spatial mapping activities under the Project. Once drafted, the newly proposed expansion or realignment maps for the targeted MPAs will be ground-truthed to gather field data to test the accuracy of the maps. The ground-truth will aid verification of the image data (maps and remote sensing data) to real features on the ground.

Activity 1.1.3. Preparation of revisions to the zoning of Selected Marine Protected Areas based on Project field verification and consultation activities. The collection of the ground-truth data for the targeted MPAs will be used to interpret, analyse and calibrate the newly proposed zoning maps for the respective MPAs. These maps will be used during consultations with communities and stakeholders to obtain their feedback. The Project will take a participatory process with stakeholders (in particular fisher households) to share the new zoning scheme for the targeted MPAs and to resolve existing and potential conflicts with respect to the proposed management schemes, according to engagement guidelines detailed in the Process Framework and the IPP. The approach will be strategic, inclusive (e.g., stakeholder involvement in decision-making processes), culturally appropriate, creative, and flexible to allow for addressing traditional uses of the areas, existing threats (inside and outside MPAs), and climate change stresses. In the case of Corozal Bay Wildlife Sanctuary (CBWS) which currently lacks a zoning scheme and has traditionally allowed fishing activities, consultations will be carried out to discuss a review of the CBWS classification to address zoning for extractive and non-extractive activities. Information collected through consultations, literature review and independent assessments will be compiled and utilized to aid finalization of the zoning maps.

Activity 1.1.4. Finalizing zoning maps for Selected Marine Protected Areas and incorporating said maps in the respective management plans of the Selected Marine Protected Areas. The new maps reflecting the expansion or realignment for each of the targeted MPAs will be incorporated into existing management plans for the MPAs and the respective management plans will be adjusted textually to reflect the new zoning scheme. The legislation (Statuary Instruments) for each of the target MPAs will also be revised to adequately reflect the new boundaries.

Activity 1.1.5. Re-demarcation of Selected Marine Protected Areas. The three target MPAs will be appropriately demarcated with buoys and signs to conspicuously depict the new boundaries. Achieving adherence to the new zoning will not happen unless stakeholders can understand the benefits of them and are made part of the process in delineating the expanded or realigned MPA boundaries. The process to involve affected stakeholders will be further addressed in Component 2 and 3 of the Project.

Map 2. Preliminary Map of the Proposed Turneffe Atoll Marine Reserve

Note: This is a preliminary map outlining the intended expansion of MPA and replenishment zones in Turneffe Atoll. The Project would support the culturally appropriate consultations and demarcation process to define the final boundary of the Marine Reserve (multiple use). The outer white line (polygon) represents the outer limits of the targeted Marine Reserve, estimated at 128,000 hectares. The yellow polygons represent what could become the replenishment areas (est. 19,218 hectares).

19. **Sub-Component 1.2. Promoting effective management of Selected MPAs, including its replenishment zones.** The Project will support improving management of the targeted MPAs particularly in the following areas:

Activity 1.2.1. Strengthening surveillance, monitoring and enforcement. The Project will build and strengthen co-management partnerships and local participation, where appropriate, for effective management of the target MPAs and ensure that they are adequately equipped with the skilled staff, resources and tools necessary for effective management. The Project will support strengthening surveillance, and biological monitoring, including construction of a ranger station, new pier, and watchtower/base station at SWCMR, procurement of field equipment such as boats for patrolling, equipment and supplies for biological and socioeconomic field monitoring, and data analysis (e.g., laptop computers to store and analyze data, patrol register system, among others). Enforcement is a crucial component of the MPA's management system and as such clearly defined enforcement guidelines and procedures (as guided by MPA management and operational plans) will be developed and implemented in order to: (i) help improve monitoring, surveillance and compliance of the MPA thus benefiting the MPA management; (ii) allow enforcement staff to act according to the guidelines and procedures; and (iii) reduce activities that do not comply with the laws and management plans. The Project will support a revision of existing enforcement guidelines and procedures for the three MPAs to ensure that they are implemented in a fair and equitable manner, and provide training for enforcement staff where needed. An independent management effectiveness assessment, focusing on analysis of biophysical, socioeconomic and governance indicators, will be carried out bi-annually (in Year 2 and Year 4) with scores recorded within a management effectiveness tracking tool. Findings will be fed back to the MPAs' management procedures to make improvements and adjustments where needed so that conservation goals can be met.

Activity 1.2.2. Supporting biological and water quality monitoring. Monitoring and enforcement information for the three targeted MPAs will be routinely collected, compiled, verified and stored within an appropriate database system for regular analysis. Participation of local communities in this activity is encouraged where appropriate. A comprehensive operational and monitoring plan for each of the MPAs will be developed based on best practices and implemented to guide systematic collection of management information and data (e.g., climate, biophysical, socioeconomic, and governance). Routine and robust biological and water quality monitoring of strategic and control sites (representing coral reefs, coral restoration sites, mangroves, and seagrass beds) within MPAs will be conducted to determine how each target ecosystem is being affected and how to improve the management strategy to maintain their ecological health and climate resilience. Monitoring of commercial fishing resources will also be carried out to evaluate the impact of the implementation of sustainable management practices (such as managed access) at the MPAs. Data collection and field work will be coordinated with the CZMAI in relation to the implementation of the ICZM Plan (see Activity 1.2.4 below).

20. **Sub-component 1.3. Supporting pilot investments to re-populate coral reefs within replenishment fishing zones.** Pilot investments will be made into repopulating reefs within replenishment zones of targeted MPAs with temperature resilient coral varieties. This will be achieved through:

Activity 1.3.1. Establishment of coral nurseries within Selected Marine Protected Areas. Two of the three target MPAs – Turneffe Atoll Marine Reserve (TAMR) and South Water Caye Marine Reserve (SWCMR) will be thoroughly groundtruthed in order to identify suitable areas for construction of coral nursery tables for propagating corals. At least six coral nursery tables will be constructed per MPA. At least four fishermen will be hired and trained to support construction and installation of nursery tables in the sea. MPA staff biologists and rangers will be trained to enable their routine monitoring of corals within nurseries.

Activity 1.3.2. Supporting coral out-planting. Coral colonies propagated within nurseries will be outplanted to locales identified in the ground-truthing. An external consultant will be hired as the Principal Investigator to help lead this effort with active participation by MPA staff.The process will be led by a Principal Investigator (external consultant) and 20-30 fishermen will be hired to participate in the outplanting efforts. Fishermen will be trained in coral outplanting techniques prior to their participation in the outplanting efforts. MPA biologist and rangers will be trained in monitoring techniques to track the health and status of outplanted corals as well as progress towards the building of reef resilience. The monitoring of coral reef resiliency will also be linked to climate stations that are being established by the Caribbean Community Climate Change Centre (CCCCC) at TAMR and SWCMR.

21. **Sub-Component 1.4. Strengthening the Belize's legal framework for the management of marine protected areas and coastal zones.** The Project would increase protection of coastal mangroves, seagrass and tidal marsh areas through supporting the implementation of an Integrated Coastal Zone Management (ICZM) Plan. The Coastal Zone Management Act, which took effect on May 8, 1998, mandated the creation of the Coastal Zone Management Authority and Institute (CZMAI) to coordinate all the different sectors active in the coastal zone, and the various interests using and managing the valuable coastal marine zones of Belize. The Authority's main purpose is to ensure effective inter-sectoral coordination and facilitate mainstreaming of biodiversity conservation issues into productive sector activities and policy development. The CZMAI also carry out scientific research and monitoring programs of marine resources, which informs CZMAI's assessments related to potential benefits or impacts to the coastal zone from investments and economic activities, design of programmes and projects to mitigate negative environmental impacts to the coastal zone, and the integration of conservation principles into sectoral planning activity.

22. The CZMAI is in the process of finalizing the national ICZM Plan for Belize. The draft ICZM Plan was completed in December 2012. The final draft is currently pending approval by the Cabinet. The plan takes into strong consideration inputs from nine established Coastal Advisory Committees (CACs) and feedback received through broader public consultations. The ICZM Plan lays out proactive and adaptive strategies to facilitate the improved management of coastal and marine resources within a specified timeframe across sectors. The Plan contains prescriptive, area-specific guidance and recommended zoning schemes guided by the strategies. The implementation of the ICZM Plan supported under the proposed Project will promote the coordination and integration of existing legislation, policies and management efforts of all organizations with mandates directly or indirectly related to the coastal and marine environment. Specific proposed activities to achieve this outcome include:

Activity 1.4.1. Review and reform of Belize's legal and institutional framework for protected areas (through co-financing by the GoB). The Project will strengthen the MPA

legal framework by supporting the sensitization process of the legal framework for PAs. The Project will also strengthen the MPA institutional framework by supporting the establishment of a national institutional framework for the management of PAs. A draft comprehensive legislation for Belize's PAs system has been prepared, as well as a proposed administrative structure for the PAs system. This is supported by Belize's current effort to upgrade legal, financial and institutional framework for the PA system including MPAs to ensure sustainability of the existing national PAs system through a GEF-funded project entitled "Strengthening National Capacities for the Operationalization, Consolidation, and Sustainability of Belize's PAs System (the SNC Project).

Activity 1.4.2. Review of mangrove regulations. The Project will support efforts to finalize the draft revised mangrove regulations to enable added protection for mangroves. Efforts toward this were carried out in 2009 but the process was not completed. The activity includes key culturally appropriate consultations, data gathering and literature review toward revising and finalizing the mangrove regulations. This will be done under the mandate of the Forest Department and in close collaboration with the CZMAI, the Department of Environment, NGOs and independent research entities to obtain the information and guidance to carry out the necessary revision and finalization of the mangrove regulations.

Activity 1.4.3. Review and reform of the CZM Act. The Project will support the review of the CZM Act to set out the geographical (e.g., the nine planning regions), legal and policy framework within which the ICZM Plan will be implemented. A CZM Act was adopted in 1998 to aid the smooth implementation of an ICZM Strategy. However, this Act is now considered outdated and in need of a comprehensive revision to be able to add legal strength for the implementation of the ICZM Plan. Under this activity, the Project will support the revision process, production of the revised CZM Act, and consultations to obtain feedback to guide revision efforts.

Activity 1.4.4. Implementation of an ICZM plan. The ICZM Plan presents critical recommendations for the long-term development of all coastal areas, including development of small, climate vulnerable cayes and of cayes found inside marine reserves. The Project will support equipping the CZMAI with the necessary personnel (in-house staff as well as from among Coastal Advisory Committees) and tools to enable monitoring of adherence to recommendations in the ICZM Plan, water quality monitoring and field data collection, compilation and analysis to track health of the coastal systems, and the strengthening of coastal outreach. This will include the procurement of water quality testing and enforcement equipment and supplies, including support to the Coastal Advisory Committees (CACs) which play an integral role in the implementation of the ICZM Plan. The CACs are responsible for monitoring the state of the natural environment and wildlife of the coastal zone in each region and activities that may impact them. The CACs will also oversee the drafting and implementation of development guidelines for their particular region. The CACs are intended as partnerships between stakeholders and the CZMAI in the coastal management process. The CACs will explore a participatory form of coastal monitoring and resource management planning that aims to reflect the needs and concerns of both local and national interests. Under the National Environmental Appraisal Committee (NEAC) umbrella, CZMAI will work proactively with the varied permitting management agencies within Belize to ensure that development plans that could affect the health of the coastal ecosystem through pollution run-off, dredging and mining and aquaculture initiatives meet the standards set within the ICZM Plan. CZMAI is a member of the NEAC which reviews, advises and

provides clearance for development projects within country (including mangrove clearance, dredging and mining, hotel resorts and aquaculture developments, etc.). CZMAI is strategically positioned within the MFFSD, which enhances alliance with the MFFSD and the NEAC to strengthen existing coastal developing licensing and permitting procedures to ensure that they are streamlined and in sync with the recommendations of the ICZM Plan. The active participation of the CACs within the varied planning regions will lend support to this process through proactive evaluation of project impacts on the ground, and the adherence to the ICZM Plan's guidelines. Support will be given to relevant governmental departments in charge of licensing and permits, and to the CACs to ensure efficient licensing procedures, cross-referencing and monitoring of pertinent license and permit. Alliances will be built with research entities and local NGOs to ensure that biological and socio-economic datasets are appropriately gathered and used to help guide permitting and mitigation actions on the ground. A steering group will be formulated to help spearhead this effort. A wider dissemination of the development guidelines of the ICZM Plan will be carried out. A user friendly and condense version (i.e. booklet and video) of the development guidelines of the ICZM Plan will be developed, published and disseminated within the key coastal planning regions and relevant governmental agencies. The booklet will provide quick and easy access to potential coastal developers on main requirements for carrying out development, including licensing and permitting requirements along Belize's coasts. They will also be made available to various media, including the CZMAI websites and social media sites. CZMAI will also carry out training for CACs personnel to ensure that they are fully verse with ICZM Plan and their role in its implementation, monitoring and evaluation, as well as developers and local business owners.

Component 2. Promotion of Viable Alternative Livelihoods (US$2.45 million)

23. This component is aimed at promoting economically viable and sustainable alternative livelihoods for communities adversely impacted by climate change and by the expansion and consolidation of Marine Protected Areas and replenishment fishing zones under the Project by, *inter alia*:

(2.1) Supporting community mobilization for the development of Alternative Livelihoods Subprojects through, *inter alia*, undertaking community needs assessments and participatory workshops for Alternative Livelihoods Subprojects planning;

(2.2) Carrying out Alternative Livelihoods Subprojects; and

(2.3) Capacity building to transition to economically viable and sustainable alternative livelihoods through, *inter alia*, providing business and occupational skills training.

24. Promotion of sustainable alternative livelihoods would also contribute to reducing the anthropogenic stressors on the marine resources which in turn increases the health of reefs and associated marine and coastal ecosystems and their resilience to climate impacts. The primary targets are the twelve (12) coastal communities that utilize the marine and coastal resources of Corozal Bay Wildlife Sanctuary, Turneffe Atoll Marine Reserve, and South Water Caye Marine Reserve as a principal source of income.

25. The Government of Belize (GoB) has placed very high priority on directly supporting measures for those communities that are heavily reliant on reef areas that would be targeted for enhanced protection. The GoB has prepared a Process Framework, complying with Operational Policy 4.12, that describes the potentially affected fishers and establishes the participatory

process by which these fishers and the Project's PIAG will jointly recommend resource-use restrictions as well as the livelihood diversification measures to mitigate the adverse impacts of these restrictions.

26. Many of the target communities depend almost entirely on fishing for their livelihood. The number of those directly affected includes at least 2,500 fishers, processors, and those who engage in tourism, and indirectly many of the 105,000 people living in the target coastal areas of Belize. Other communities which used to engage in agricultural production have increasingly turned to fishing due to economic downturn in the agricultural sector. Also a majority of these fishermen is not well organized to collectively cope with the declining fish population and competitions from increasing number of poor fishermen. If this situation continues, damage on the marine resources and ecosystems from increasing and unorganized fishing activities will be irreversible and too severe to build resilience of the marine ecosystem to climate change impacts.

27. The fishing industry in Belize is small scale, commercially artisanal, organized by fishermen cooperatives and associations. Since 2004, there has been a steady increase in the number of fishers who were issued with fishing licenses. In 2011, there were 2,582 licensed fishermen with approximately 1,377 registered fishing vessels involved in the fishing industry. The Project is expected to benefit approximately 1,600 fishers who depend on the resources from the three target areas. Fishing also contributes to the local economy by impacting indirectly on the commodity/supply chain. Additionally, fishing contributes to food security through consumption of the household's catch. Even though fishing is a significant sector in Belize's economy, 45% of fishing households are poor or are vulnerable to poverty. Poor households in Belize are on average made up of 6.7 members. The poor households in the target communities do not have enough earnings to reach the US$ 1,500 per year to cover the necessities of each household member. With such high dependence on marine resources, combined with poverty, poor social services, poor infrastructure and weak institutions governing fishing communities, the negative effects of climate change on their livelihoods and income are likely to be severe. The effects that are likely to be felt at the household level are loss of income, loss of food security, increase in poverty and at the community level, and a diminished local economy. This could lead to migration to cities and urban centres further exacerbating existing problems in the urban areas.

28. Some of the target fishing communities currently have no means to setting up alternative livelihood ventures. This situation is compounded by the fact that the fishermen from these communities are not organized into a cooperative or an association. Chunox Village, for example, whose economy is agriculture-based (primarily sugar cane), has been experiencing a significant downturn. Cane farmers have consequently been resorting to fishing as an alternative livelihood, thereby significantly adding to the number of fishermen that originate from this community. The fishermen from the other villages (with the exception of Hopkins and Placencia) depend almost entirely on fishing for their livelihood. There is great potential to set up fisheries-based ventures as well as viable tourism ventures and other alternative livelihoods in these communities, but this requires significant initial capital investments that are not currently available to these communities.

29. Recent evidence suggests that fisheries and the fishing industry have been in decline since the mid 1990s. A study estimates lobster sales in Turneffe Atoll to cooperatives declined by about 70% from 2004 to 2009, while conch sales declined 56.7% over the same period. (Fedler, 2011) Finfish production was consistently equal to 500,000 pounds until 1992, but since

2003 it has declined to less than 10,000 pounds per year. Therefore, declines in fishing incomes are assumed if no effective measures are to be taken. (See Annex 7.) With decline in fisheries stocks largely due to decline of coral cover induced by higher sea-surface temperatures and more severe and more frequent coral bleaching, it appears inevitable that coastal communities heavily engaged in "catch fishing" will continue to face key livelihood challenges. Nonetheless, the emergence of new technologies for both traditional fisheries and aquaculture indicate the sector will continue to be an important contributor to local and national production and employment for a long time. There is, however, a need for eco-friendly strategies to help the sector through its transformation to ensure its sustainability.

30. This component would specifically support: (2.1) community mobilization for the participatory and culturally-appropriate identification and planning of viable and sustainable business ventures for alternative livelihoods and employment opportunities, (2.2) provision of financial and technical support for sustainable business ventures, including training and development of marketable skills essential for the transition to alternative livelihoods. The business ventures will be developed through a guided process including the preparation of a business plan to support the development of products and services all the way through to distribution and service delivery. This component will be implemented in direct partnership with co-managers of marine PAs, local conservation NGOs, and fishing cooperatives and associations. Affected users from the following communities eligible to participate in this component are: (a) Corozal Town, (b) Belize City, (c) Dangriga, (d) Consejo, (e) Copper Bank, (f) Chunox, (g) Sarteneja, (h) Hopkins, (i) Sittee River, (j) Riversdale, (k) Seine Bight, and (l) Placencia. Other coastal communities that do not currently appear as affected communities in current MPA management plans are also eligible to participate if it is established during Project implementation that they are indeed affected by the MPA and replenishment zones expansion and enforcement activities of Component 1.

31. **Sub-component 2.1. Supporting community mobilization for the development of Alternative Livelihoods Subprojects:** The Project will support the participatory development of community-based business ventures that can leverage the opportunity cost of fishing. The process of developing these ventures and alternative livelihood strategies will be underlined by a culturally appropriate, participatory decision-making process described in detail in the Project's IPP. Community members will be supported to mobilize themselves in order to identify viable sustainable livelihoods Sub-projects in a participatory manner. The approach will help to ensure that there is equity in the process and that all affected users including women and indigenous peoples, have the opportunity to become involved in and benefit from alternative livelihoods activities funded by the Project. Taking this approach will acknowledge culturally appropriate decision-making practices while supporting small fishing communities to develop their capacity to assess their own needs, and design community level actions and solutions in the future. This process will be facilitated by a community development expert. The Project will assist community members to mobilize themselves through:

Activity 2.1.1. Community Needs Assessments: Initial meetings will be held to create an awareness of the goals of the Project in terms of climate change adaptation and to discuss the opportunities for the development of alternative livelihoods for affected users. This will be followed by needs assessment workshops to facilitate the direct engagement of community members, including women, in devising and developing ideas for potential alternative livelihoods activities. This process will assist community members to map out their own resources and assets, identify and diagnose constraints to local social and economic

development from household to community level, and identify required management and technical skills. The main outputs of this process will be the: (a) establishment of a common vision on how to pursue alternative livelihood strategies, (b) active engagement of community members to ensure buy-in for alternative livelihoods, (c) gender empowerment by ensuring a process that seeks the input of both men and women and (d) the identification of potential business ventures and investment opportunities. These will then be prioritized based on viability and other collectively established criteria.

Activity 2.1.2. Participatory workshops for Alternative Livelihoods Subprojects planning. Development of Sub-projects is driven by demands from the communities. The second step in the participatory planning process will be the further development of the prioritized Sub-project ideas and potential opportunities. This process will establish Sub-project goals and objectives, identify the main activities and the target beneficiaries, and develop a budget. The Sub-project program including eligibility, eligible and ineligible expenditures, selection criteria, and process will be developed and detailed in the POM. Eligible applicants include all users of the target MPAs who are affected by the Project interventions. The applications will be made through their representative organizations such as fishing associations or cooperatives. Size of each Sub-project would vary depending on the type of investment proposed. Potential businesses activities that will be considered for funding by the Project include: (a) fisheries diversification initiatives that capitalize on eco-friendly fishing activities; (b) value-adding to final fishery products through processing, introduction of standards, eco-labeling, utilizing fish parts that are currently discarded as waste; (c) poly-culture of marine products; and (d) community-based sustainable aquaculture, agriculture and tourism-related activities. In-kind contribution will be required from Sub-project beneficiaries to ensure commitment. The completed Sub-project application will then be submitted for review and approval in accordance to the process established in the Operation Manual.

32. **Sub-component 2.2. Carrying out Alternative Livelihoods Subprojects.** This involves technical assistance to Sub-project proponents to develop a business plan for the approved Sub-project proposal. Included in this process will be information on resources and raw materials to be used as inputs, organizational plan, operating plan, financial plan, and marketing plan. The business plan is essential in various aspects: (a) to commercialize the production; (b) to rationalize the management structure; (c) to develop an efficient operation; (d) to understand the risks and have a plan to deal with them; (e) to identify their niche and explore new markets; and (f) to inform investors and attract investment into the production. Developed business plans then will be reviewed through a process established in the POM.

33. The Project will provide financial and technical support for viable and sustainable community-based business ventures with approved business plans. Regular monitoring field visits will be carried out for all approved Sub-projects. The Project will also provide assistance in marketing for the approved business plans. The marketing expert will assist in the identification and development of the potential niche markets, development of marketing materials, advising on packing and product and service quality, and identification of potential business partners and distributors where possible. The marketing expert will also ensure that each business venture is registered with the Small Business Development Center at the Belize Trade and Investment

Development Service (BELTRAIDE)[27] in order to ensure continuous business support over the long term. Market opportunities that directly encourages sustainably managed fishery through eco-labeling and certification will be actively sought and developed as this is now a viable business reality in the industry both locally and globally. Locally, this activity will be tied to the tourism industry where possible and collaboration will be pursued with the Belize Tourism Board on their certification initiatives under their Quality Assurance Programme.

34. **Sub-component 2.3. Capacity building to transition to economically viable and sustainable alternative livelihoods.** In addition to the specific technical training proposed and financed under the approved Sub-projects, the Project will provide training necessary to build the skills of the coastal communities to transition to alternative livelihoods, based on training needs identified during the community mobilization phase. This will be done by focusing on skill sets that supports small business development and individual marketable skills.

Activity 2.3.1. Business skills training for alternative livelihoods. A comprehensive training program will be established for beneficiaries under this component. This is to ensure that beneficiaries develop the skills necessary to sustain and maintain the transition to alternative livelihoods. This includes training in financial literacy, business management, production and relevant socio-environmental management, marketing, quality control and financial management.

Activity 2.3.2. Occupational skills Training. Training support for the attainment of marketable and employable skills for individuals will also be done in order to support those who wish to transition to full time employment in other sectors or self-employment. Training in marketable individual skill sets will be mainly in the areas of: (a) mari-culture; (b) eco-tourism, (c) agriculture and (d) vocational education. These four areas were selected based on the current social, human and physical assets of the local communities. Many are already engaged in livelihood strategies in these areas as they attempt to diversify their own livelihoods and as such the Project will be building on existing knowledge and experience and will not necessarily have to recreate existing social capital that supports longstanding fishing activities. A diagnostic study of fishing communities in CARICOM concluded that almost half of the income of fishing families in Belize is derived from activities other than fishing[28]. Additionally, the areas selected are all tied to the largest and fastest growing sector of the Belizean economy—tourism. The training under this section is aimed at supporting: (a) independently-operated profitable enterprises, and (b) employment or self-employment for individuals. For training in mari-culture, the Project will collaborate directly with the Fisheries Department. Some of the training under eco-tourism in areas such as tour guiding, will be carried out in collaboration with the Belize Tourism Board's Training Unit. The Institute for Technical and Vocational Education (ITVET) will assist in providing training for vocational activities and will assist in job placements for trainees.

35. One alternative livelihood strategy is to provide the affected fishers with preferential access to the buffer around the replenishment zones, so that they can fish the spill-over and have some exclusive rights to this benefit from the conservation. To this end, this component supports

[27] http://belizeinvest.net/about/

[28] Diagnostic Study to Determine Poverty Levels in CARICOM Fishing Communities, Caribbean Regional Fisheries Mechanism (CRFM), 2012.

the Fisheries Department's national roll out of its Managed Access Program which is aimed at regulating the fisheries and employing the rights-based approach to fisheries management. Under the Program, fishers in the Southwater Caye and Turneffe Atoll Marine Reserves will be granted with fishing access based on their traditional fishing in these areas. This will ensure that communities who have depended on these areas for their livelihoods are not marginalized by the regulation of access to the national fisheries and to promote co-management of the resources and voluntary compliance of the Fisheries Regulations by the fishers.

36. Consultations with local fishers and NGOs involved in sustainable natural resources management have yielded a list of potential alternative livelihoods opportunities that can be pursued commercially. These include, supporting economically viable and sustainable wild harvesting of the Florida Stone Crab (*Menippe mercenaria*) using locally available and environmental friendly materials. Only the large claw of the crab would be removed and the crab would be released to the ocean to allow for natural regeneration. Another alternative activity highlighted is the cultivation and processing of seaweed (*Graciliaria spp.*). Large scale production could be done in the shallow coastal areas which provide adequate environmental and marine conditions for extensive farming systems. Seaweed cultivation and processing is already being undertaken on a pilot basis by the Placencia Fishermen's Cooperative Society Limited in the southern region and it has shown very positive results. Another viable alternative activity is community-based farming of the Red Hybrid Tilapia (*Oreochromis spp*.), 'River Lobster' or Malaysian Prawn (*Macrobrachium spp.*), Sea Cucumber (*Holothuria spp.*) and the Australian Freshwater Lobster (*Cherax quadricarinatus*). Tilapia farms would be located on the mainland in plastic tanks and vegetable greenhouses can use the waste water for irrigation. These aquaculture initiatives would decrease the vulnerability of small-scale fishers by providing additional income to fishers and their families. The farming of tilapia is currently being done on a small scale by the Sarteneja Tilapia Growers and Development Association in northern Belize. Also, marine tourism-based activities such as tour-guide training, whale shark tourism, dive master, and sailing, would be selectively supported based on their economic viability and sustainability.

37. Specific emphasis will be placed upon gender equity through household-centered livelihood diversification support, the participation of indigenous peoples (namely Garifuna fishers in Stann Creek) and civil-society organizations through the design and implementation of the alternative livelihood activities. During the preparation of the Project, local communities were consulted to determine specific activities and target communities to be supported. Women were found to play an integral role in harvesting marine resources both through their direct productive involvement and social reproductive roles. Women are involved in extraction as well as in the marketing of fish products. They are also involved in a supporting role where they prepare materials and supplies for fishing expeditions and manage household income from fishing. Consequently, the Project will ensure that women have an opportunity to participate and express their aspirations during the identification and development of Sub-projects for funding. Gender-related issues that affect the wellbeing of fishing families and inhibit the participation of women will be addressed. Further recognizing the role of women, the Project will encourage spouses and youth from fishing families to develop Sub-projects and submit for financing. Women will also be given the opportunity to participate in all training activities carried out under the Project. Beyond being gender sensitive, the Project will ensure that women have a role in decision-making in order to benefit directly from the Project and strengthen the position of women structurally.

38. Affected indigenous Garifuna communities will also be fully engaged in promoting their involvement in managing marine resources and in the development of alternative livelihoods that are culturally appropriate. Sub-projects that promote or preserve Garifuna culture will be considered for funding once the viability of the proposed activities has been assessed. Some examples include manufacturing and marketing of Garifuna drums, traditional dress, or the creation of cultural entertainment groups that support the strengthening of cultural tourism.

39. The role and engagement of civil society organizations including fishers associations and natural resource management NGOs will be a key feature of this Project especially in the promotion and development of alternative livelihoods strategies. Local conservation organizations, cooperatives and fishing associations have continuously engaged the targeted communities, therefore the Project will build on those existing relationships and will avoid creating any new organizational structures within the communities.

40. This component will work in tandem with the ongoing *Sustainable Natural Resource-based Livelihoods Project* funded by the Japanese Social Development Fund and the *Small Island Developing States Community-based Adaptation Program* funded by AusAid to ensure synergy in economic diversification and climate change adaptation of livelihood activities for local communities.

Component 3. Raising Awareness and Building Local Capacity (US$0.56 million)

41. The objectives of this component are to: (a) increase the understanding by local stakeholders about impacts of climate change and the value of marine conservation to build support for the National Protected Areas Policy and System Plan (NPAPSP) as a strategy to ensure the long term sustainability of natural resources, (b) build local capacity to develop and explore climate resilience strategies, and (c) provide regular and accessible public information on climate change effects in the marine ecosystems and coastal zone to promote behavior change designed to minimize climate risks in MPAs and replenishment zones (for example, through respecting the relevant laws, reduction of overfishing and reporting of infractions, etc.).

Activity 3.1. Carrying out a climate change knowledge, attitude and behavioral practice (KAP) survey. A survey to identify needs and understand gaps in the knowledge, attitudes and behavioral practices of Belizeans, especially in coastal communities, with respect to climate change will be conducted. The results of the KAP survey will be used in the design of targeted PAs and climate change knowledge and awareness raising programs. KAP survey results will also be used in the design of a communications strategy to improve the knowledge, attitudes, and practices of targeted coastal communities, thereby increasing capacity for climate change resilient communities, ecosystems and relevant economic sectors. The target audiences are: (a) fishermen, (b) eco-tourism operators, (c) coastal communities, (d) private sector, and (e) youth and students. The Project will ensure that women and indigenous groups (i.e., the Garifuna) are given special attention. The KAP surveys will follow a six-step process: (i) define the survey objectives, (ii) develop the survey protocol, (iii) design the survey questionnaire, (iv) implement the survey, (v) analyze the data, and (vi) use the data which includes translating the survey findings into action and disseminating the survey findings. Data from the initial KAP survey will be used to orient resource allocation for behaviour change communication campaigns, and to establish a baseline for comparison with subsequent KAP surveys at mid-term and end of the Project.

Activity 3.2. Disseminating information about Project. This activity will promote learning and cooperation between the Project and the marine conservation and climate adaptation community. Specifically, the Project would disseminate periodically: (a) updates of Project activities (via quarterly electronic and print newsletters), (b) comments and blogs from Project participants on a web-based platform designed for the Project, and (c) lessons learnt and best practices developed from Project activities, among Project participants. The latter will be shared via a best practices forum in Year 2 and Year 4 of the Project implementation. Project beneficiaries and other Project stakeholders will gather for one-day symposium that will include exhibits and poster presentations, seminars, and workshops. The symposium will allow the PIAG to share Project-related information in an atmosphere of learning and information exchange. One of the forums will be convened in the northern region and the second forum in the southern region.

Activity 3.3. Designing and implementing a coordinated behavior change communication (BCC) strategy. This activity is aimed at changing public attitudes and behaviour. The strategy will provide a framework for delivering targeted key messages on climate change issues to the following target audiences: (a) fishermen, (b) eco-tourism operators, (c) coastal communities, (d) private sector, and (e) youth and school students. The Project will ensure that women and indigenous groups (i.e., the Garifuna) are given special attention. The strategy will recommend actions to raise awareness of climate change and its impacts, and the appropriate medium and method for communicating said actions. The strategy will focus on the adaptation element, which is concerned with impacts of a changing climate on society, the economy and the environment, and promotes activities to reduce vulnerability of marine and coastal ecosystems (and livelihoods) to extreme weather events and other longer term changes in our climate. The communication strategy will aim to: (a) raise the awareness level of coastal communities on the opportunities and threats brought about by climate change, and the roles they can play in adapting to its impacts; and (b) provide guidance and best practice tools on how to communicate adaptation to climate change. The goal will be to create a community that is well informed about climate change and thus make locally to globally responsible choices.

Activity 3.4. Supporting inter-community learning and dialogue. While the individual fishermen associations would be able to design and implement Sub-projects on their own, they would not be able to effectively participate in and contribute to climate change initiatives at national level and advocate for improvements in their livelihoods in isolation from each other. The Project will therefore support inter-community dialogues and learning events among the participating fishing communities who face similar challenges to adapt to climate impacts. The communities will learn from each other's climate adaptation Sub-projects. Leadership development training sessions will focus on inclusive climate resilience through collaboration among different communities and dialogue and mediation skills, mentoring of community leaders, as well as training in advocacy at the institutional level. The trainees will play a key role in supporting the implementation of the BCC strategy and action plan in Year 2 and 4 of the Project implementation. Institutional strengthening will include the development of a medium-term strategic plan for inclusive climate resilience for the resulting network of fishermen/women, which would be integrated into the strategic plans of the various fishermen/women associations. A committee comprised of leaders of the various fishermen/women groups will serve as the planning team.

Component 4. Project Management, Monitoring and Assessment (US$0.52 million)

42. This component will support the Project Implementing Agency Group (PIAG) to undertake (a) Project management and implementation support including technical, administrative and fiduciary support and compliance with environmental and social safeguards; and (b) monitoring and evaluation, data collection, and stakeholder involvement and coordination.

Annex 3: IMPLEMENTATION ARRANGEMENTS

BELIZE: Marine Conservation and Climate Adaptation Project

I. Institutional Arrangements

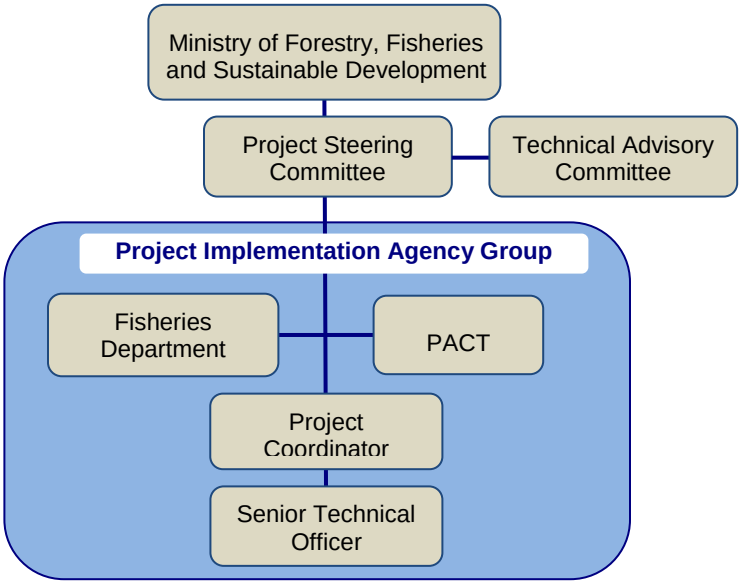
1. **The Ministry of Forestry, Fisheries and Sustainable Development (MFFSD)** is responsible for the overall implementation of the Project with the fiduciary assistance of Protected Areas Conservation Trust (PACT). MFFSD houses key units for the implementation of the Project, including Fisheries Department, National Protected Areas Secretariat (NPAS), Forest Department, and Department of the Environment (DOE) (Figure 3.1).

2. **The Project Steering Committee (PSC)** will support Project implementation by providing guidance on national policy and on strategic approaches for successful Project implementation. The PSC will be chaired by the Chief Executive Officer (CEO) of the MFFSD, and comprised of representatives of key ministries/organizations including the Ministry of Finance and Economic Development (MFED), Coastal Zone Management Authority & Institute (CZMAI), the Ministry of Natural Resources and Agriculture, Ministry of Labor, Local Government, Rural Development and National Emergency Management, Ministry of Tourism and Culture. Fisheries Department and PACT would be *ex-officio* members of the PSC. The Committee will advocate on behalf of the Project and when needed to obtain support for the legal and other system wide changes such as operationalization of revised administrative structures for PAs and the management and administration of environmental impact assessment processes. Fisheries Administrator, along with the Project Manager, will provide administrative support to the PCS and coordinate the logistics for the operations and activities of the Committee. The PSC will meet quarterly and convene special meetings on an as needed basis.

3. **The Technical Advisory Committee (TAC)** will provide general technical guidance for Project implementation, including with regard to screening and evaluation of technical aspects of Sub-project proposals, as further set forth in the Project Operational Manual (POM). The TAC is comprised of representatives from Fisheries Department, the Department of the Environment, Climate Change Office, Economic Development under the MFED, NPAS, and PACT. TAC will be chaired by Fisheries Administrator and empowered to invite other technical advisors as needed. TAC will meet once every two months and will convene special meetings to address particular Project issues that may arise. During those meetings, the TAC will focus on actionable items related to Project implementation.

4. **Project Implementing Agency Group (PIAG)** within MFFSD would carry out the day-to-day management of the Project, and Sub-projects, including coordination, supervision, monitoring, quality control, socio-environmental management, and reporting in accordance with the Grant Agreement and the POM. The PIAG will consist of a Project Coordinator, a Senior Technical Officer, staff from Fisheries Department, and fiduciary staff of PACT. PACT will be responsible for ensuring sound fiduciary management of the Project's resources. Funds will be transferred to PACT under a Subsidiary Agreement with the Government. No funds will flow directly to the Sub-project beneficiaries.

Figure 3.1: Project Implementation Organizational Chart



II. Project Management Instruments

5. **Project's Operational Manual (POM)** defines the institutional arrangements, procedures, requirements, and guidelines for the management and implementation of the Project. It is also intended to help in ensuring that the Project is implemented in a transparent manner. The POM is a working document and its contents will be subject to periodic review and updating as necessary over the life of the Project given the flexibility required by the diversity of Sub-project conditions that could be encountered during implementation. Such changes are subject to approval of the World Bank.

6. **Annual Operating Plan (AOP) and Procurement Plan (PP)**. The PIAG is responsible for preparing AOP and PP in consultation with key stakeholders. The AOP should provide a plan for the Project implementation of each year including the overall goal, planned activities, timeframe and budget. The PP reflects procurement activities required to implement the planned activities. The PIAG sends the AOP and PP to the TAC for comments and the PSC for approval. Once approved by the PSC, the AOP and PP are then sent to the World Bank for no objection.

III. Monitoring and Evaluation of Project Results

7. The MFFSD will be responsible for the overall monitoring and evaluation (M&E) of the Project through the PIAG in accordance with the POM and the Grant Agreement. The M&E plan will form a part of the annual work plan of the PIAG. The outcome indicators are presented in Annex 1. M&E of Project implementation status and results will be conducted through: (a) day-to-day activities of the PIAG; (b) quarterly progress reviews by the PSC and once every two months by the TAC; (c) semester progress reviews during World Bank implementation support missions; and (d) a mid-term review to be conducted jointly by the MFFSD/PIAG, PSC, TAC, and the World Bank.

8. The PIAG will transmit to the World Bank semester progress reports on Project implementation and outcomes not later than one month after the end of the period covered by

such report. An Implementation Completion Report will be prepared within six months after closing of the Grant.

IV. Financial Management Arrangements

9. *Financial Management Inherent and Control Risks*. The financial management (FM) functions for this Project will be solely handled by the Protected Areas Conservation Trust (PACT), acting as the fiduciary agent on behalf of the Recipient. No funds will flow to the Sub-project beneficiaries. A time-bound action plan was defined for the Project. Once implemented, with World Bank's support, residual inherent and control risk are rated as Moderate-I (high impact, low likelihood).

10. *Financial Management Arrangements—Flow of Funds.* PACT will be the only entity handling Grant proceeds. The entity will open a bank account denominated in US$ named the Designated Account at the Central Bank of Belize. The threshold for the advance is up to US$500,000, and the minimum value of application is US$200,000. The entity will open another bank account denominated in BZ$ named the Operating Account (OA) in a commercial Bank, the Belize Bank. Bank accounts will be segregated. The entity will process disbursements through Statement of Expenditures (SOEs) as support documentation and record of summary sheets. Disbursement methods would be advance, reimbursement, and direct payment. These and other relevant disbursement matters will be inserted in the Disbursement Letter.

11. *Grant Agreement and Project Operational Manual.* The periodicity of financial reports submission is set as quarterly during project inception only for the first audited period and semiannual for following fiscal years. Annual audits for the entity are to be performed by an independent audit firm to be submitted four months after the end of the audited period. Periodic Interim Unaudited Financial Reports (IFRs), Annual Financial Statements, and External Audit reports, will be distributed and discussed among the members of the PSC, and posted in the internet portal of the Entity for public access. Other FM aspects, including internal control and risk management features, will be defined in the Operational Manual.

12. *FM Supervision Plan.* The scope is defined as a comprehensive implementation support mission, including full on-site supervision covering all areas specified in the FM supervision checklist, with a governance and anticorruption (GAC), with special attention to FM red flags. The frequency of FM supervision by the World Bank will be annual. The intervals and scope will be revised with the supervision results as indicated in the FM risk rating.

13. In summary, the FM inherent and control residual risks are Medium-I (high impact, low probability) once PACT, with Bank's support, completes a time-bound action plan to mitigate risks. The World Bank will assist in the drafting of an FM Chapter in the Project Operational Manual. Periodic desk reviews and comprehensive risk based on-site FM implementation support will be conducted with a GAC approach, being alert on FM red flags, highlighting areas for improvements, and providing support to have all instances expeditiously resolved and closed.

V. Disbursements

14. PACT will be responsible for processing all payments for works, goods and services. Payments will be made directly from the OA. Such arrangements are considered appropriate. This arrangement has the necessary segregation and level of approvals and can speed up implementation.

15. The community-based business ventures (Sub-project program) will be disbursed by PACT subsequent to the approval and verification process stipulated in the POM. The relevant documentation issued will serve as the supporting documentation for disbursement and accounting. Bank's disbursement would be made against the predetermined amount in accordance with the approved activity.

16. The following disbursement methods will be used: Advance, Reimbursement and Direct Payment. The Minimum Application Size with respect to Direct Payments and Reimbursements (not Advances) will be in US$ 200,000 equivalent. Applications documenting expenditure paid from the Designated Account should be submitted by PACT ideally once a month but not later than once every three months, and must include reconciled bank statements as well as other appropriate supporting documents. Retroactive Financing will be allowed for payments made prior to the date of the grant agreement but after September 1, 2014, up to an aggregate amount of US$ 140,000 equivalent under disbursement categories 1, 2 and 3. The Project will also have a four month Grace Period.

Table 3.1. Eligible Expenditure Categories

Category	Amount of the AF Grant Allocated (expressed in USD)	Percentage of Expenditures to be Financed (inclusive of Taxes)
(1) Goods, works, non-consulting services, consultants' services, Training, and Monitoring and Compliance Activities, except for Part 2 of the Project	2,560,000	100%
(2) Goods, works, non-consulting services, consultants' services, and Training for Part 2 of the Project	2,450,000	100%
(3) Operating Costs	520,000	100%
TOTAL AMOUNT	5,530,000	

17. The Project Operational Manual includes a list of excluded expenditures which are not eligible for financing under the Grant.

VI. Procurement Arrangements

18. *Procurement of works.* (No major works under the Project is foreseen.) For the small works for establishing nurseries, etc. under Sub-projects, shopping procedures for small value contracts (<US$150,000 equivalent) as agreed with the World Bank will be followed.

19. *Procurement of Goods and non-consulting services (NCS).* Goods procured under this Project include, but not limited to: buoys and signage for new boundaries, supplies and equipment for nurseries & out-planting of coral reefs and other technical equipment (Boats, outboard engine, boat trailer, mounted & hand held radios, binoculars, GIS software etc.). NCS procured under this Project include mainly the logistics for workshops. The procurement would be carried t using the World Bank's SBD for ICB processes and Shopping (Request for Quotations) documents (<US$50,000 equivalent) agreed with or satisfactory to the World Bank.

20. *Selection of Consultants.* Consulting services would be required under this Project for management planning, zoning map consultancy, need assessment etc. Individual consultants would be selected following the procedures set forth in Section V of the Guidelines, whereas

consulting firms would be selected following Quality and Cost Based Selection (QCBS), Least-Cost Selection (LCS), Selection Based on Consultant's Qualifications (CQS) etc. Short lists of consultants for services estimated to cost less than $200,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

21. *Sub-project procurement.* PACT, in line of the approved business plan under Activities 2.2.2, will make the necessary arrangement for procurement of required goods, consulting and non-consulting services following the procedures specified above.

22. *Operating Costs.* These mean the following reasonable incremental operational costs (which would not have been incurred absent the Project) related to Project implementation, management and supervision and incurred by the Recipient and PACT: (i) costs for utilities, maintenance and consumable office supplies, printing services, and communication services; and (ii) transportation costs, travel and per diem cost for supervisors and technical staff which will carry out supervisory activities under the Project.

23. *Procurement Assessment.* An assessment of the capacity of PACT as the fiduciary agency to implement procurement actions was carried out in March 2014 for the Project by a World Bank's procurement accredited staff during preparation in line with the Procurement Risk Assessment and Management System (PRAMs) by the World Bank. Questionnaire for PRAMs was shared with PACT and the officials in MFFSD and PACT's team were interviewed on the assessment of the Procurement. The following are the summarized findings (with details entered in the PRAMs):

24. The procurement financed by donors and international financing institute including the World Bank shall follow their respective procurement procedures respectively.

25. An assessment of the capacity of the Implementing Agency to implement procurement actions under the Project was conducted. The assessment reviewed the organizational structure for implementing the Project and the interaction between the procurement staff in PACT and the PIAG in MFFSD with a Project Manager for project implementation. The overall Project risk for procurement is rated as moderate based on the proposed mitigation arrangement for procurement implementation below:

Action Plan in Strengthening the Capacity to Implement Procurement Actions:

a. A procurement specialist selected for the position in PACT under the Management and Protection of Key Biodiversity Areas Project (WB/GEF, P130474) will implement the procurement activities under the proposed AF Project.

b. The procurement specialist and the PIAG/PACT Project team shall attend training for procurement in the regional Fiduciary Workshop in 2015.

c. Tender/selection documents for the first year's procurement under ICB and QCBS prepared by PIAG/PACT should be submitted to the World Bank for review by the effectiveness of the Project.

26. *Procurement Plan.* The procurement plan for implementation of the Project for the first 18 months was agreed between the Recipient and the Project Team on January 6, 2015. The plan shall be made available at web address http://www.worldbank.org/procure within 30 days of the signature of the Grant Agreement. It would be updated annually and the updated procurement plan shall be disclosed at this site after clearance by the World Bank.

27. The recommended thresholds for the use of the procurement methods specified in the Grant Agreement are identified in Table 3.2 as the basis for the agreed procurement plan.

28. *A General Procurement Notice (GPN)* would be published in the UN "Development Business" on-line around the period of Loan Negotiation. For ICB goods and works contracts and large-value consultants contracts (more than US$200,000), Specific Procurement Notice would be advertised in the Development Business on-line and national press.

29. *Frequency of Procurement Supervision.* Supervision of procurement would be carried out through prior review supplemented by supervision missions with post review at least once a year.

Table 3.2: Thresholds for Procurement Methods and Prior Review

Expenditure Category	**Contract Value (Threshold) US $ thousands**	**Procurement Method**	**Contracts Subject to Prior Review**
1. Works	>1500	ICB	All
	<1500	NCB	First
	<150	Shopping	None
2. Goods and Non Consulting Services	>150	ICB	All
	<150	NCB	First
	<50	Shopping	None
	Regardless of value	Direct Contracting	All
3.Consulting Services			
-3.A Firms	≥100	QCBS,QBS,FBS, LCS	All
	<100	QCBS,QBS,FBS,LCS, and CQS	First contract
	Regardless of value	Single Source	All
-3.B Individuals	Regardless of value	Comparison of 3 CVs in accordance with Chapter V of the Guidelines	None
	Regardless of value	Sole Source	All

Note: ICB = International Competitive Bidding; NCB = National Competitive Bidding
QCBS = Quality- and Cost-Based Selection; QBS = Quality-Based Selection
FBS = Fixed Budget Selection; LCS = Least-Cost Selection
CQS = Selection Based on Consultants' Qualifications

VII. Environmental and Social (including safeguards)

30. *Environmental Assessment OP/BP 4.01*. The Project is classified as Category B as per OP/BP 4.01 on Environmental Assessment and requires a partial Environmental Assessment (EA). Its main expected environmental impacts are positive as presented along the PAD and particularly in Annex 6. Component 2 supports economically viable and sustainable alternative livelihoods for local populations whose economic activities are directly impacted by the adverse effects of climate change and the planned expansion of the replenishment zones and MPA network. Potential alternative livelihoods activities include poly-culture of marine products such as seaweed farming combined with cultivation of other marine products (e.g. conch, lobsters, sea

cucumber, and crab) in integrated cultivation systems. Training for other marine tourism-based activities such as tour-guiding, whale shark tourism, diving, and sailing will also be selectively supported by the Project, based on their economic viability and environmental sustainability.

31. Environmental management of Project activities is required due to potential adverse impacts of the referred livelihood activities on human populations or environmentally sensitive areas. However, the same are expected to be readily mitigated as they are likely to be site-specific and reversible. Since the exact location and/or nature of potential small investments to be financed under the Project have not yet been determined, the GoB has prepared an Environmental Management Framework (EMF) to conform to the environmental safeguard policies triggered by the Project and the applicable national regulations. The EMF provides (i) a basic environmental characterization of the Project intervention areas; (ii) a diagnosis of the legal framework related to the environment theme in the different sectors that the Project will support, and the institutional framework that will be involved; (iii) assessment of potential adverse environmental issues or impacts commonly associated with the potential types of alternative livelihood projects and the ways to avoid, minimize or mitigate them; (iv) establishment of clear procedures and methodologies for environmental planning, review, approval and implementation of sub-projects to be financed under the Project; and (v) specification of roles and responsibilities and the necessary reporting procedures for managing and monitoring environmental concerns arising from the sub-projects. The EMF provides basic guidance on best practices for aquaculture/mariculture and tourism activities. A final draft of the EMF was consulted with Project stakeholders on September 26, 2014 in Belize City. The proceedings of this meeting are documented in Annex 1 of the EMF. The EMF was disclosed in-country and at the World Bank's InfoShop on November 14, 2014.

32. *Natural Habitats OP/BP 4.04.* This policy is triggered as the Project directly targets positive impacts in critical marine habitats helping to rehabilitate, restore, and protect degraded critical marine ecosystems (such as coral reefs) that are important to preserve marine and coastal biodiversity and the quality of water resources. The EMF explicitly forbids any support for livelihoods activities in areas supporting critical natural habitats or inducing conversion or degradation of critical natural habitats. The EMF includes guidance on avoiding negative impacts of cultivation of exotic species such as Red Hybrid Tilapia. Impact monitoring and evaluation will be defined for any harvesting activities during sub-project preparation.

33. *Forests OP/BP 4.36.* The Project will not lead to the destruction of forests and forest ecosystems, but will in fact support rehabilitation/restoration of critical marine forest areas, such as mangrove and littoral forests through community-based activities. Similar to the natural habitats, the EMF explicitly forbids any Project activities possibly supporting destruction or conversion of forests and forest ecosystems. However, due to the presence of forest ecosystems at potential sites, this policy is triggered as a precaution.

34. *Pest Management OP/BP 4.09.* Pest management may be necessary for livelihoods Sub-projects to be financed under the Project. In those cases, the Project will promote use of Integrated Pest Management (IPM) as defined and instructed in the OP/BP 4.09. The Project will not finance chemical pesticides or lead to increased use of other agricultural chemicals unless an Integrated Pest Management Plan (IPMP) is developed and applied. The EMF includes guidelines for rational and efficient pesticides management, and a need for developing a specific IPMP will be identified during the Sub-project categorization. When needed, an IPMP will be developed before Sub-project approval and implementation.

35. *Physical Cultural Resources OP/BP 4.11.* The Project could involve small structural works and since Belize has thousands of Mayan Antiquities buried under the forests, chance finds might occur within the Project's intervention areas. Further, potential tourism-related livelihood activities could involve a known cultural site. Belize has a well-developed program for management of Mayan Antiquities in situ and ex situ. If antiquities are encountered during Project implementation, the Institute of Archaeology will be notified immediately, and as the competent authority, it will make the decisions on how any chance find would be managed. Additionally, the EMF explicitly forbids activities that would negatively impact any known cultural site, and refers to detailed guidance on how to manage any cultural site that would be developed for tourism purposes in a sustainable manner, aimed at causing a positive impact on the same. The EMF also mandates that in case of any difference/gap between the national legislation and the World Bank safeguard policy, the stricter approach will prevail.

36. *Indigenous Peoples OP/BP 4.10.* The GoB prepared and disclosed a Culturally Appropriate Consultation and Participation Plan (Indigenous Peoples Plan). It has been disclosed in country and the World Bank's web site on November 14, 2014, in full compliance with OP 4.10. The Plan includes a summary of the project's social impact assessment, description of stakeholder consultations, analysis of the project's potential social impacts and mitigation measures, culturally appropriate consultation protocol, steps for livelihoods restoration and diversification, and grievance redress mechanism. In sum, the Plan establishes the measures through which the GoB will engage with the indigenous Garinagu and Mestizo fishing communities who are adversely affected by the project in culturally appropriate ways, according to their own governance structures, language preferences and traditions, and ensure that the eligibility criteria used to allocate benefits under Component 2 are culturally appropriate and fully inclusive of the country's culturally diverse communities. A final draft of the IPP was consulted with Project stakeholders on September 26, 2014 in Belize City.

37. *Involuntary Resettlement OP/BP 4.12.* Project activities will likely result in involuntary restrictions of sections of MPAs that are currently used by local communities. For that reason, Involuntary Resettlement (OP/BP 4.12) is triggered. Under OP 4.12, a Process Framework has been prepared and disclosed in country and on the World Bank's web site on November 14, 2014. Its purpose is to establish guidelines for livelihood restoration and diversification strategy under Component 2 to mitigate the impacts of restrictions on livelihood activities in target sites. In order to mitigate a range of social risks and to prevent, manage and resolve potential disputes, a Project-wide grievance redress mechanism has been established and described in the Process Framework. A final draft of the Process Framework was consulted with Project stakeholders on September 26, 2014 in Belize City.

38. *Projects under Disputed Areas OP/BP 7.60.* This policy is applicable to the proposed Project because of the longstanding territorial dispute between Belize and Guatemala. Some of the six geographical areas that have been identified and prioritized for the proposed activities under the Project fall within the general area known to be in dispute. The proposed Project does not prejudice the position of either the Bank or the two countries involved. It is emphasized that by supporting the Project, the World Bank does not intend to make any judgment on the legal or other status of the territories concerned or to prejudice the final determination of the parties' claims. In line with OP/BP 7.60, the World Bank has ensured compliance with the requirements of the policy. The Bank has determined that given that the Project activities entail capacity building and small-scale community driven sustainable forest management practices and

improvements to the management of PAs, the Project is not harmful to the territorial interests of Guatemala.

Annex 4: OPERATIONAL RISK ASSESSMENT FRAMEWORK (ORAF)

BELIZE: Marine Conservation and Climate Adaptation Project

Project Stakeholder Risks						
Stakeholder Risk	**Rating**	**Moderate**				
Risk Description:	**Risk Management:**					
Some stakeholders (local communities, land owners, and/or NGOs) may not support the proposed activities (e.g., the proposed expansion of MPAs).	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 Project. A robust consultation process with local communities and organizations has been undertaken during project preparation which confirmed the level of commitment towards the proposed activities including the expansion of MPAs.					
	Resp:	**Status:**	**Stage:**	**Recurrent:**	**Due Date:**	**Frequency:**
	Client	Not Yet Due	Implementation	☐	31-Mar-2020	
Implementing Agency (IA) Risks (including Fiduciary Risks)						
Capacity	**Rating**	**Moderate**				
Risk Description:	**Risk Management:**					
MFFSD and PACT do not have much experience in implementing Bank projects.	PACT has staff specifically trained to administer and monitor donor-funded projects and systems to accurately track and manage grant funds. MFFSD and PACT have increased the project management capacity through the preparation of another Bank project and the fiduciary training course. The Bank will continue assessing this risk and mitigating it with frequent supervision as needed and training efforts integrated in the operations.					
	Resp:	**Status:**	**Stage:**	**Recurrent:**	**Due Date:**	**Frequency:**
	Bank	Not Yet Due	Both	☐	31-Mar-2020	
Governance	**Rating**	**Moderate**				
Risk Description:	**Risk Management:**					
Corruption in the Government is reportedly high. While it is not foreseen, the governance structure, operational guidelines and other institutional policies of MFFSD and/or the implementation arrangements of the Project could be altered over time and, if so, these might not conform to the adequate	MFFSD and PACT both have a robust management and fiduciary system. The Project implementation will be governed by the Operational Manual satisfactory to the Bank and overseen by the multi-sectoral Steering Committee. External audits, FM and ex-post procurement reviews by the Bank will be conducted annually.					
	Resp:	**Status:**	**Stage:**	**Recurrent:**	**Due Date:**	**Frequency:**
	Client	Not Yet Due	Implementation	☐	31-Mar-2020	

standards.						
Design	**Rating**	**Moderate**				
Risk Description:	**Risk Management:**					
Community-based activities may take time to actually start implementation on the ground due to low capacity.	The proposed activities will coordinate and share experience with other on-going community-based efforts led by the Government of Belize. The Project will particularly focus on strengthening institutions and capacity building so as to carry out the activities within the proposed timeframe.					
	Resp:	**Status:**	**Stage:**	**Recurrent:**	**Due Date:**	**Frequency:**
	Client	Not Yet Due	Implementation	☐	31-Mar-2020	
Social and Environmental	**Rating**	**Moderate**				
Risk Description:	**Risk Management:**					
Project activities may not be able to successfully restore livelihoods of local stakeholders (communities, tourism business owners, and NGOs) affected by MPA restrictions. Women and vulnerable groups may not perceive inclusive benefits from the Project activities. In case of insufficient technical guidance and supervision, alternative livelihood activities may cause different types of negative environmental impacts.	As part of Project preparation activities, the GoB has prepared a social assessment based on field research with target communities to describe their cultural background, livelihood activities, socioeconomic situation and potential adverse impacts from project interventions and related mitigation measures. Furthermore, the GoB prepared a Process Framework to ensure that livelihood diversification efforts under Component 2 achieve the restoration of livelihoods affected by project-supported restrictions in compliance with OP4.12, and an IPP has been prepared in compliance with OP4.10. Additionally, the Operational Manual mandates that the Project will support only activities that comply with sound socio-environmental management. The EMF developed for the Project will guide prevention and mitigation of negative environmental impacts, as well as use of good practices to facilitate positive impacts, describing the applicable responsibilities and procedures. Both the Project and Bank staff will engage in Sub-project supervision and continuous guidance for implementation.					
	Resp:	**Status:**	**Stage:**	**Recurrent:**	**Due Date:**	**Frequency:**
	Client	Not Yet Due	Implementation	☐	31-Mar-2020	
Program and Donor	**Rating**	**Low**				
Risk Description:	**Risk Management:**					
Associated projects that complement the proposed Project may not materialize.	The Project activities are not dependent on co-financing from the associated projects. Major complementary activities come from the projects anticipated under the CPS which has been agreed by the Government. Some of these projects have already been under implementation.					
	Resp:	**Status:**	**Stage:**	**Recurrent:**	**Due Date:**	**Frequency:**
	Bank	Not Yet Due	Both	☐	31-Mar-2020	
Delivery Monitoring and Sustainability	**Rating**	**Moderate**				
Risk Description:	**Risk Management:**					

<table>
<tr><td rowspan="3">Belize's vulnerability to natural hazards, capacity and resource limitations could constrain sustainability of the project achievements.
Even if the Project succeeds in removing the local stressors, it may not be enough for the reef’s survival in the face of climate change.</td><td colspan="6">The Project is mitigating this risk through training and strengthening the technical capacity. In addition, the Project includes a participatory and consultative process with different stakeholders (including communities and NGOs) and will be implemented in a similar manner across organizations to ensure close coordination.
Moreover, the Bank continues to assess the resource issue and mitigate it with efforts to support the Government seeking additional resources for continued activities.</td></tr>
<tr><td>Resp:</td><td>Status:</td><td>Stage:</td><td>Recurrent:</td><td>Due Date:</td><td>Frequency:</td></tr>
<tr><td>Both</td><td>Not Yet Due</td><td>Both</td><td>☐</td><td>31-Mar-2020</td><td></td></tr>
<tr><td colspan="7">Overall Risk</td></tr>
<tr><td>Overall Implementation Risk:</td><td>Rating</td><td colspan="5">Moderate</td></tr>
<tr><td colspan="7">Risk Description:</td></tr>
<tr><td colspan="7">The overall implementation risk is moderate, as no substantial risks are identified.</td></tr>
</table>

Annex 5: IMPLEMENTATION SUPPORT PLAN

BELIZE: Marine Conservation and Climate Adaptation Project

1. The Implementation Support Plan (ISP) describes how the World Bank and other development partners will support the implementation of the risk mitigation measures (identified in the ORAF) and provide the technical advice necessary to facilitate achieving the PDO (linked to results/outcomes identified in the result framework). The ISP also identifies the minimum requirements to meet the World Bank's fiduciary obligations.

2. *Technical Support Needed:* The Project's intervention covers wide-ranging areas such as marine and coastal biodiversity, ecosystem services, marine protected area management, environmental policy, community-based development, small business development, marketing, environmental management, social development, climate change mitigation and adaptation, disaster risk management, and communications. The World Bank Task Team will involve specialists in these areas within the institution and may add external experts in the areas where necessary.

3. *Risk Mitigation Measures:* The proposed Project is focused on strengthening resilience to climate change impacts and natural disasters through investment activities, improved legal framework, and capacity building. In parallel, the Project will coordinate with the Management and Projection of Key Biodiversity Areas Project (a GEF grant) under preparation which also includes activities to strengthen resilience in forested areas and provide opportunities for alternative livelihoods for affected stakeholders.

4. *Capacity:* The World Bank continues to assess this risk and mitigate it with close supervision and training efforts integrated in the operations. An emphasis will be placed on developing an effective implementation structure and monitoring program. Before the Project effectiveness, the World Bank will retroactively finance the capacity enhancements for the PIAG with qualified technical and administrative staff. The World Bank will work closely with the PIAG to (a) provide necessary inputs early in the process of preparing technical and procurement documents according to the Annual Operating Plan and Procurement Plan, (b) support and follow up the review process of approving such documents on the client's side, and (c) review and provide no objections or comments efficiently.

5. *Delivery Monitoring:* The World Bank will assist in the Project's monitoring and evaluation program by (a) providing adequate information and data management practices, (b) sharing good examples and lessons learned from other operations including reporting templates and information systems, and (c) conducting field trips to the target MPAs and local communities during every supervision missions, (d) exchanging information with other donor agencies with similar projects, and (e) conducting a thorough mid-term review with external experts specialized in the subject in Belize. In addition, as per the Corporate Agreement between the AF Board and the Bank, dated 26 August 2014, an inception report and a final evaluation report will be prepared.

6. *Fiduciary Aspects:* The World Bank will check the implementation status quarterly in the first year and determine the specific training needs for the client. The first procurement and financial management training has already been provided prior to the appraisal. Training will be repeated or customized as necessary during the project implementation. Ex-post reviews and FM reviews by the World Bank's specialists will be conducted once a year.

7. *Safeguards:* The Project will not invest in any large infrastructure or other activities that require a full Environmental Impact Assessment. Therefore, the World Bank's environmental specialist will participate in supervision missions and field visits at least once a year and otherwise support the environmental aspects of the investments remotely on an as-needed-basis. The anticipated level of environmental supervision is 2 staff weeks per year. Social aspects of the Project investments will be supported by a social development specialist on the team who is expected to make one field visit every year. It is proposed that these safeguards specialists combine missions for different projects in Belize that they supervise, and, if possible, combine training for the clients and stakeholders of the same.

8. *Thematic:* The Project has been developed under the current Country Partnership Strategy (FY12-15). Also there are several projects which are closely linked to the Project (e.g., Promoting Sustainable Natural Resource-based Livelihoods Project, Climate Resilient Infrastructure Project, and Management and Protection of Key Biodiversity Areas Project). Therefore, Project supervision may be integrated to broader thematic or implementation support missions (i.e. fiduciary or sectoral) as adequate. This will be done in consultation with the country team.

The main focus in terms of support to implementation

Time	Focus	Skills Needed	Resource Estimate	Partner Role
First twelve months	Establishing the project management structure and getting the project implementation on track	Project management, Procurement, FM, Disbursement, Technical expertise, Safeguards	17 staff weeks	Project management, technical coordination, fiduciary management
12-48 months	Support and monitoring for achieving intended outcomes	Thematic expertise, Safeguards	72 staff weeks	Project management, technical coordination, fiduciary management

Skills Mix Required

Skills Needed	Number of Staff Weeks per year	Number of Trips per year	Comments
• Marine Biologist	2	2	
• Biodiversity Specialist	4	2	
• Environmental Management	2	1-2	
• Social development	1	1	
• Small business development/marketing	2	Local	
• Climate Change	2	2	
• Communications	1	Local	
• Project management	1	1	
• Procurement	2	1	
• FM	2	1	
• Disbursement	1	N/A	
• Legal	1	N/A	

Partners

Name	Country	Role
Ministry of Forestry, Fisheries, and Sustainable Development (MFFSD)	Belize	Technical Coordination and implementation of activities in the targeted areas
Protected Areas Conservation Trust (PACT)	Belize	Fiduciary management
Local communities/NGOs	Belize	Implementation of on-the-ground activities in the target areas

Annex 6: ECONOMIC, SOCIAL AND ENVIRONMENTAL BENEFITS

BELIZE: Marine Conservation and Climate Adaptation Project

1. **The value of ecosystem services generated by the coral reefs and mangroves contributes between 15 and 22% of GDP in Belize.** The World Resources Institute (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% of GDP, in avoided damages per year by buffering against storm surge and reducing erosion.[29]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% of Belize's 2007 GDP.

A. Environmental benefits

2. 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 replenishment zones would promote the reproduction of commercially important overexploited marine species such as the Nassau Grouper (*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 Project.

3. In addition, 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 are listed as critically endangered by the IUCN Red List, 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.

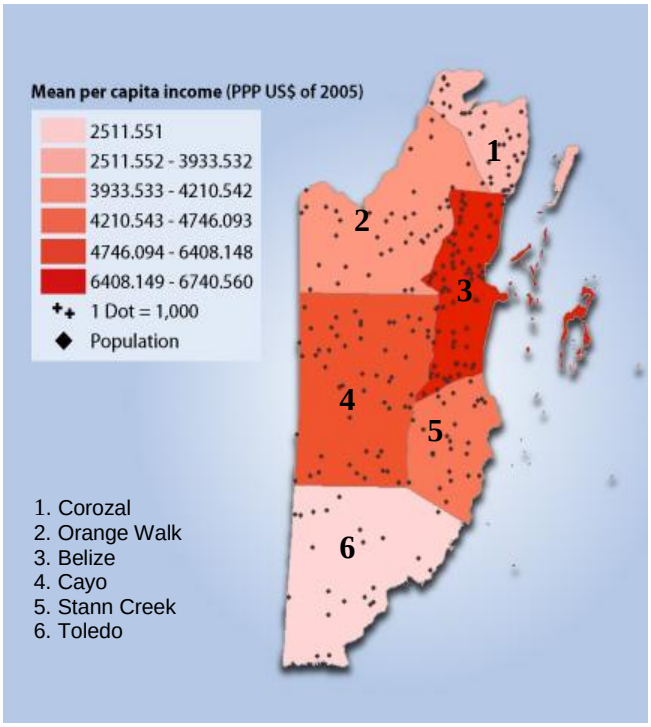
[29]This is an upper bound on the damage estimates that would be incurred in coastal areas in the absence of mangroves and coral reefs, and further analysis of scenarios of gradual degradation of reef and mangrove ecosystems are needed to provide the lower- and mid-range estimates of the value of shoreline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

4. 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 20.2% of marine ecosystem thus significantly increasing the protection and management of this crucial ecosystem.[30]

B. Social Benefits

5. The proposed adaptation, conservation, and restoration activities of the Belize Barrier Reef System are of socio-economic significance, providing an opportunity for maintaining and potentially increasing the income level, food security and marine resources available for an estimated 203,000 people living in the coastal areas of Belize. Many of the 105,000 people living in the target coastal communities will indirectly benefit from the Project intervention. Most of these communities are low-income fishing communities. According to the National Poverty Assessment of 2010, about 41.3% of the population (approximately 114,000 people) remains below the poverty line. Of the total poor population, 55.3% live in rural areas[31]. Extreme poverty is concentrated in the Toledo and Corozal districts (see Figure 6.1 and 6.2).

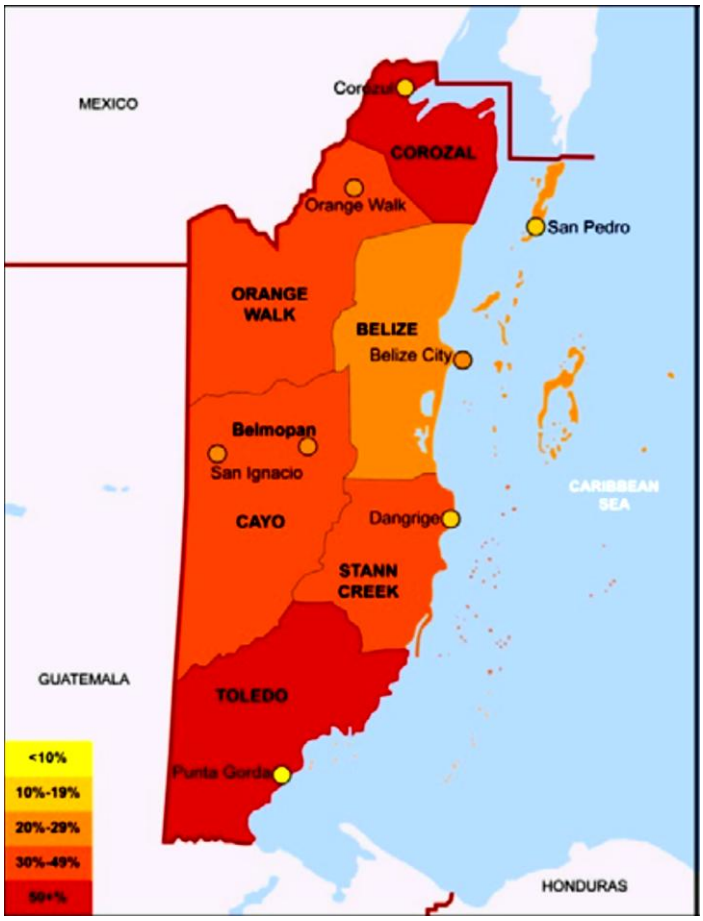
Figure 6.1 Per Capita Income and Population in Belize by District



[30] The national MPA network currently covers approximately 386,612.80 hectares, or 20.2% 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.
[31] Belize Country Poverty Assessment Report, 2010

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

Figure 6.2: Poor Households in Belize by District (percentage)



Source: Belize Country Poverty Assessment Report, 2010.

6. The Project aims to ensure long and medium term social benefits, while mitigating the immediate effects that project-supported restrictions will have on the livelihoods of affected people. In addition to these direct impacts, addressed in detail in the Process Framework, a number of other low, medium and high impact social variables from five areas of social life are identified in the social assessment within the Culturally Appropriate Consultation and Participation Plan: population characteristics, individual and household, lifestyle and wellbeing, acquaintanceship and interpersonal networks, political and institutional resources and community resources. An important point that stands out is that the fisher communities are not homogenous in terms of the income level, class status, capacity or vulnerabilities/opportunities. Therefore, the study signals elite capture as a risk. In other words, it is possible that community members who are more versed in relating to Project activities either through their position or capacity can take full advantage of the resources and opportunities provided by the Project to the detriment of the least capable and least organized. This could skew the distribution of benefits in one direction and further reinforce or widen the gap between the elite and the poorer members of the

fisher communities. More specifically, such a gap could occur between fishermen and those engaged in mainstream tourism or even between different members of fishing communities.

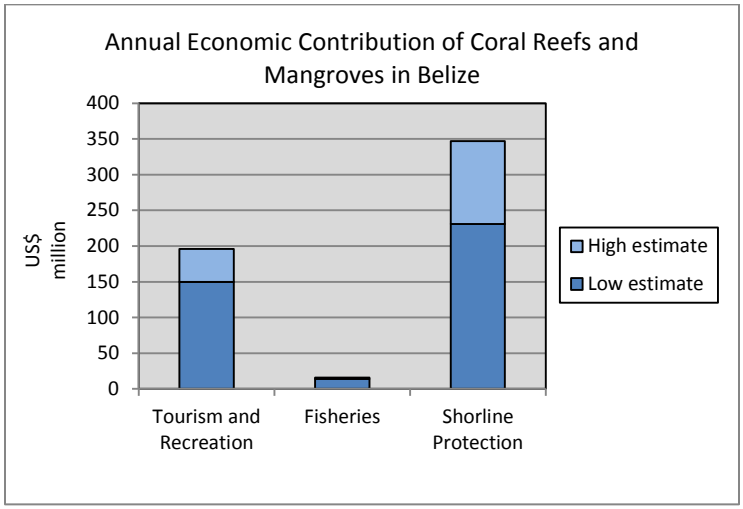
7. Effective exclusion of already marginalized groups such as poorer community members, elderly, youth and women could also occur. At times those who should be the primary beneficiaries can become "invisible" and "voiceless". To ensure that social benefits are equitably distributed, clear criteria for participation and approval of project resources will be clearly established and communicated. Support will be provided for community members to organize, plan and participate in Project activities. This includes assisting them to meet Project requirements where necessary, such as technical languages and procedures, to ensure barrier-free access to Project benefits.

8. Since fishing is generally considered a male dominated activity most of the support given to fishers have been directly to male fishermen with the assumption that such support translates into direct benefits to the household. Women have often been excluded from participating in decision-making and in sharing in the benefits of community development activities related to fishing. The Project will support the direct participation of women in decision making and support the fishing-related economic activities that they already carry out - such as preparation for fishing voyages, processing of fish and commercial management of family-run enterprises and cooperatives - through the alternative livelihood component.

C. Economic Benefits

9. 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 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 resiliency of marine resources, and the promotion of alternative livelihoods.

Figure 6.3: Annual Economic Contribution of Coral Reefs and Mangroves in Belize



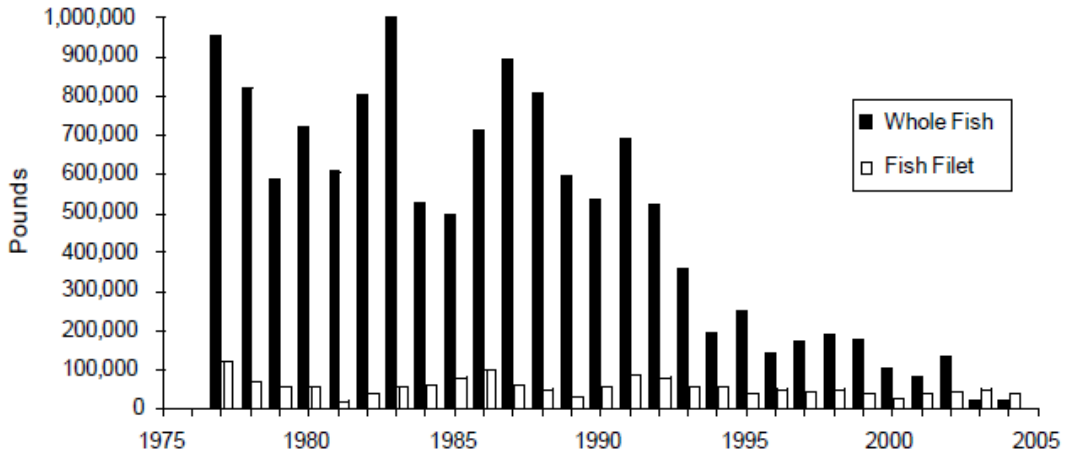
Source: Cooper *et al*., Coastal Capital: Belize, WRI, 2008

10. *Fisheries.* Belize's fisheries are threatened by overfishing and a reduction of coral cover. By expanding 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. Fishing is an important cultural tradition, as well as a safety net and livelihood for many coastal Belizeans. Belize's fishing industry is ranked 5th in the national economy. Total fishery export earnings (capture fishery sector only) increased by 20% from US$10.8 million in 2010 to almost US$13 million in 2011. Fishing contributed 2.2% of GDP in 2010.

11. Spawning aggregations of reef fish in Belize have been heavily depleted from historical levels. Nassau grouper, the most well-studied species has been depleted to the point that localized extinction is possible. In spite of intensive efforts to conserve the species in Belize, including new legislation offering both a nearly complete closure of fishing at the species' aggregation sites and a closed season, stocks have reached dangerously low levels. Following national landings statistics, historical exports of finfish from Belize exceeded 500,000 pounds per annum between 1976-1992, peaking at a million pounds in 1983 (Figure 6.4). A rapid drop in exports started in the mid 1990s and has not rebuilt. Nassau grouper roe was sold largely in-country but was still being exported during the mid 1990s, reaching a peak of 1,000 pounds in 1996. This practice was halted by 1999 but the damage had already been done.

Figure 6.1: Export of Finfish from Belize from 1975 to 2005

Export of finfish from Belize from 1975 to 2005. The majority of that reported is grouper and snapper. Data are from the exports of National and Northern Cooperatives and summarized by the Belize Fisheries Department.



Source: Heyman, W.D. and B. Wade. 2007. Status of reef fish spawning aggregations in Belize. Proceedings for the Gulf and Caribbean Fisheries Institute 58: 301-306.

12. Nationally, lobster and conch rank as number one and two marine exports with a contribution in 2010 of US$7.14 million and US$3.31 million, respectively (Ministry of Agriculture and Fisheries 2010). However, these precious resources are under tremendous pressure and saw a 70% and 50% decline respectively from 2004 to 2009 country-wide (Fisheries Department 2009). Turneffe alone accounted for a reduced 6.2% of lobster and 2% of conch sold nationally and to cooperatives, down from an approximate 20% and 6.2% respectively of national supply (Turneffe Atoll Trust (TAT), 2011). If the Project is able to restore the fisheries to the 2004 level, the value from lobster and conch in Turneffe alone amounts to approximately US$1.62 million.

13. Coastal communities such as Sarteneja, Chunox, Copper Bank, Caye Caulker, Dangriga, Hopkins, Seine Bight, Placencia, Mango Creek, Monkey River and Punta Gorda are highly dependent on fishing. It is estimated that the Project would directly benefit approximately 1,600 fishers and their households. Fishery records show that 90-95% of total lobster and conch landings are exported mainly to the United States of America, earning roughly US$13 million in gross revenue. The fishing industry in Belize provides direct employment for about 2,582 licensed fishers (Capture Fisheries Unit Annual Report 2011. Fisheries Department). More than 50% 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 110 fulltime employees and the aquaculture farms employ 730 employees who are responsible for processing, packaging and administering the daily activities. In recent years, some 'full-time' fishers who have benefitted from various training opportunities have sought employment in the tourism industry as tour guides. Under the Project, viable alternative livelihoods would be supported to promote the exit of additional fishers. Fisheries diversification activities would also be supported to optimize the economic value of marine products. These Project interventions will help to reduce fishing effort/pressure from the coral reef systems.

14. *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% 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–$262 million from coral reef- and mangrove-associated tourism in 2007. For Turneffe alone, tourism generates an estimated gross US$ 23.5 million annually from attractions such as snorkeling, diving, and sport fishing (TAT, 2011). 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[32]. The Healthy Reefs Report Card for the Mesoamerican Reefs 2010 reports 65% of Belize's reefs being in poor to critical condition and of the five Turneffe sites two are in fair, two in critical and one in poor condition.

15. *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.[33] Turneffe is one of the three bio-physical barriers protecting Belize City, Belize's largest urban settlement. From east to west these include Lighthouse Reef, Turneffe Atoll and the Belize Barrier Reef. Underwater, these barriers play an important role in preventing storm surge during extreme weather events. Turneffe Atoll acts as the first line of defense against storms as history has shown that many storms reduce in sustained wind speeds and overall effects as they pass over Turneffe Atoll before approaching the mainland (Wildtracks, 2011)[34]. The annual value of shoreline protection services provided by coral reefs and mangroves of Turneffe is estimated at US$38 million (TAT, 2011).

[32]Cooper E, Burke L, and Bood N. (2009) "Coastal Capital: Belize. The economic contribution of Belize's coral reefs and mangroves. "WRI working Paper. World Resources Institute, Washington, DC. 53p .

[33] 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.

[34] The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating, in order of increasing intensity, based on a hurricane's sustained wind speed.

Annex 7: COST-BENEFIT ANALYSIS

BELIZE: Marine Conservation and Climate Adaptation Project

1. The economic analysis focuses on Components 1 and 2 given the difficulty in quantifying the effects of increased awareness. For Component 1, attention is given on the benefits and costs of creating the new MPA at Turneffe and improving management effectiveness at SWCMR and CBWS. Quantifying the effects of efforts to improve the management effectiveness of MPAs across Belize is difficult; hence the analysis conservatively assumes that the only benefits afforded by the Project are in the three aforementioned areas.

2. In sum, the selected benefits exceed costs for different discount rates applied (4%, 10% and 20%). In terms of benefit break-even, if the only benefits realized by Component 1 are those associated with coral reefs on Turneffe, benefits will cover the costs of Component 1. Also, it is concluded that preserving reefs and mangroves is cost effective even if they offer only 1/20th of the shoreline protection offered by levees. Also Component 2 is worth undertaking even if the benefits are slightly lower than the conservative estimates. This is true even in the strictest case of the shorter time horizon and the highest discount rate, where long-run recovery of the fishery has not had much time to take place and fewer fishers and processors have transitioned into higher-valued occupations.

Component 1 Analysis

3. Existing efforts to estimate the benefits of MPAs and the coral reefs and mangroves they contain have focused on three of the use benefits: (i) tourism/recreation, (ii) fisheries, and (iii) shoreline protection (e.g., Alban et al. 2006, Cesar et al. 2003, Conservation International 2008, Cooper et al. 2009, Das and Vincent 2009, Vergara et al. 2009, Fedler 2011, Pascal 2011). These three benefits are arguably among the most important benefits in quantitative terms for the ecosystems being valued in this analysis, but they are not the only benefits that are likely to be quantitatively important. Thus, the benefits estimates derived here should be viewed as lower bounds.

4. *Economic Valuation of Coral Reefs and Mangroves.* A recent study by Fedler (2011), estimates the annual value of the tourism, fisheries and shoreline protection benefits provided by coral reefs and mangroves on Turneffe. The tourism (and fisheries) estimates are based on data collected specifically for his study. The estimates for shoreline protection are derived from the Belize-wide study conducted by the World Resources Institute (Cooper et al. 2009). The Turneffe estimates are obtained by taking the Belize-wide estimates, expressing them in per-acre terms, and then multiplying by the number of acres of mangrove and coral reef, respectively, on Turneffe. More recent data on mangrove and coral acreage was used to re-derive the estimates of shoreline protection benefits provided by Turneffe's mangroves and reefs.

5. For SWCMR and CBWS there is little or no data on tourism. Accordingly, per-acre benefits for coral reefs and mangroves derived from Cooper et al.'s Belize-wide study are applied to data on coral reef and mangrove acreage for each of the two areas. The per-acre benefits were derived from Cooper et al, and the per-acre (revised) benefits for Turneffe. These per-acre benefits are the key values used in our analysis of benefits with and without the Project.

Table 7.1 shows the total benefits for each of the three areas, derived using the per-acre values and the acreage data. These estimates are referred as the base annual benefits.

Table 7.1: Base Annual Benefits (US$)

Category	Corozal Bay Wildlife Sanctuary	South Water Caye Marine Reserve	Turneffe Atoll
Tourism			
Coral Reef	$16,800	$5,271,000	$25,597,846
Mangrove	$1,545,462	$640,202	$11,376,820
Shoreline Protection			
Coral Reef	$18,360	$5,760,450	$16,820,820
Mangrove	$4,265,475	$1,766,958	$17,743,367

Note: Belize-wide per-acre estimates are derived from Cooper et al. (2009) for CBWS and SWCMR. Turneffe tourism estimates are from Fedler (2011). Acreage data are from Belize Coastal Zone Management Authority and Institute (Canto 2013) for coral reef and the Water Center for the Humid Tropics of Latin America and the Caribbean, and Cherrington et al. 2010 for mangrove.

6. *Estimated Benefits and Costs of Component 1***.** Table 7.2 presents estimates of the present value of the costs of Component 1 and the benefits quantified assuming a 10-year time horizon (2013-2022) and three different discount rates. Coral reef benefits are largest for Turneffe because of its large reef acreage and the larger difference between with- and without- Project coral cover due to the creation of a new protected area, as opposed to increased management effectiveness of an existing protected area. Mangrove benefits are largest for SWCMR because it has the highest without-project acreage loss rate and a large area of mangrove cover. Note that the costs cannot be separated by ecosystem type (coral reef versus mangrove), nor can they be separated by area because the implementation costs of Component 1 are joint.

7. The last row of Table 7.2 indicates the selected benefits exceed costs for all three discount rates. In terms of benefit break-even, if the only benefits realized by Component 1 are those associated with coral reefs on Turneffe, benefits will cover the costs of Component 1. This is true even at the highest, 12%, discount rate. Recall that the Turneffe coral benefits are based on the very conservative assumption that the Project results in a reduction in annual coral cover loss on the order of 1 percentage point compared to the without-project scenario. To put this number in context, recall that over the past three years, available data indicates that annual coral cover loss on Turneffe has been on the order of 10%.

8. Analogous estimate assuming a 20-year time horizon (2013-2032) markedly increases the desirability of Component 1. This is a result, in large part, of the growing divergence between with- and without-project coral cover over time. The estimated benefits now exceed costs by a wide margin for all three discount rates. In terms of benefit break-even, if the only benefits realized by Component 1 are 55% of those estimated for coral reefs on Turneffe, benefits will cover the costs of Component 1: at the 12% discount rate, 55% of estimated Turneffe coral benefits equal $9,373,808, while costs are $9,317,656.

Table 7.2: Present Value of Costs, Selected Benefits, Net Selected Benefits (USD) - 10-year Horizon

	Discount Rate		
Selected Benefits	10%	12%	4%
Corozal Bay			
Coral Reef	$3,804	$3,367	$5,620
Mangrove	$46,527	$41,168	$68,861
South Water Caye			
Coral Reef	$1,193,404	$1,056,512	$1,763,325
Mangrove	$307,067	$271,767	$454,103
Turneffe Atoll			
Coral Reef	$9,052,239	$8,015,749	$13,365,837
Mangrove	$46,527	$37,519	$62,761
Combined			
Coral Reef	$10,249,447	$9,075,629	$15,134,782
Mangrove	$395,998	$350,453	$585,726
Total Selected Benefits	$10,645,445	$9,426,082	$15,720,508
Total Costs	$8,203,097	$7,660,983	$10,310,531
Net Selected Benefits	$2,442,348	$1,765,099	$5,409,977

9. For the cost-effectiveness analysis, it is considered an alternative to protecting coral reef and mangrove ecosystems. Given limited data availability, focus is on the shoreline protection services provided by the Turneffe Atoll to Belize City. The atoll's location directly east of Belize City results in the atoll being especially important to moderating storm damages (Fedler 2011).

10. A recent study prepared for UNDP (Simpson et al. 2010) provides estimates of the cost of protecting Belize City given projected sea level rise of one to two meters in the 21st century. Approximately 40 km of shoreline are estimated to be in need of protection. The costs of two types of protection are estimated: levees, which would cost $197.4 million (USD) to construct, and a sea wall, which would cost $684.3 million to construct. Annual maintenance costs are estimated to be 10% of construction costs for levees and 2.5% for sea walls.

11. Sea walls offer considerably greater protection than levees (Heberger et al. 2009). The analysis assumes that levees are the alternative likely to render shoreline protection comparable to that offered by preserving and restoring Turneffe's reefs and mangroves. The assumption is that the levees last for 100 years. To render costs comparable to those incurred by Component 1

over our 10-year and 20-year time horizons, the analysis annualizes the levee construction cost of $197.4 million over 100 years and then compute the present value of 10-year and 20-year streams of this annuity. The present values of these streams are added to the present value of the annual maintenance costs, yielding the present value of construction plus maintenance costs. These present values are presented in Table 7.3 for different discount rates, and for the two time horizons.

Table 7.3: Present Value of Levee Construction and Maintenance Costs

Project Horizon	Discount Rate		
	10%	12%	4%
10-Year	$242,596,312	$245,379,488	$225,446,397
20-Year	$336,127,692	$324,385,116	$377,749,905

12. These costs are an order of magnitude larger than the total Component 1 costs in Table 7.2. It is difficult to quantitatively compare the shoreline protection provided by levees and the shoreline protection provided by preserving and restoring reefs and mangroves. However, a comparison of the costs in Table 7.2 and the total costs in Table 7.3 reveals that preserving reefs and mangroves is cost effective even if they offer only 1/20th of the shoreline protection offered by levees.

Component 2 Analysis

13. The economic viability of Component 2 is evaluated by comparing the present value of benefits with the Project and the present value of Component 2 costs. Table 7.4 presents the 10-year time horizon. The top part of the table presents the without-project scenario, which assumes there is no re-employment of fishers and processors in alternative occupations, and that the fishery continues to decline according to assumptions. The lower part of the table presents the with-project scenario, which assumes that fisheries recover and re-employment occurs. The benefits reported in the lower part of each table represents the difference between the present value of all incomes with the Project (fisher/processor incomes plus alternative livelihoods income) and the present value of all incomes without the Project (fisher/processor incomes only).

14. The estimate in the table implies that Component 2 is worth pursuing at each discount rate, and for both short and long time horizons, as the net benefits are positive in every case. The longer time horizon affords the highest net benefits, as there is more time for re-employment of fishers and processors into tourism and seaweed farming to take place, and more time for fish stocks to recover through more effective management of existing protected areas and the designation of new replenishment zones. Referring to the estimates in the table, the benefits with the Project are about 1-4% higher than the benefit break-even point that renders net benefits equal to zero. This implies that Component 2 is worth undertaking even if the benefits are slightly lower than our conservative estimates presented in the "Total Benefits" row of the table. This is true even in the strictest case of the shorter time horizon and the highest discount rate, where long-run recovery of the fishery has not had much time to take place and fewer fishers and processors have transitioned into higher-valued occupations.

Table 7.4: Present Value of Incomes, Benefits, Costs, and Net Benefits (USD) - 10-year Horizon

	Discount Rate		
	10%	12%	4%
Without Project			
Fisher/Processor Income	$287,309,296	$264,939,069	$375,830,730
With Project			
Fisher/Processor Income	$212,568,157	$196,416,199	$276,236,529
Alternative Livelihoods Income	$79,109,627	$70,766,683	$113,488,444
Total Benefits	$4,368,488	$2,243,813	$13,894,244
Total Costs	$1,936,963	$1,854,650	$2,221,799
Net Benefits	$2,431,525	$389,163	$11,672,444

Notes: Alternative livelihoods income is from tourism and seaweed farming. Benefits with project are equal to sum of fisher/ processor and alternative livelihoods income with project minus fisher/processor income without project.

Annex 8: MAP OF REEF AREA IN BELIZE

BELIZE: Marine Conservation and Climate Adaptation Project