

United Nations Development Programme

Country: Haiti

PROJECT DOCUMENT



Project Title: Increasing resilience of ecosystems and vulnerable communities to CC and anthropic threats through a ridge to reef approach to BD conservation and watershed management

ISF Outcome: 2.2: environmental vulnerability reduced and ecological potential developed for the sustainable management of natural and energy resources based on a decentralised territorial approach

UNDP Strategic Plan Environment and Sustainable Development Primary Outcome: 3: mechanisms for climate change adaptation are in place

Expected CP Outcomes:

See ISF outcome

Expected CPAP Output (s)

1. Priority watersheds have increased forest cover
2. National policies and plans for environmental and natural resource management integrating a budgeted action plan are validated
3. Climate change adaptation mechanisms are put in place.

Executing Entity/Implementing Partner: Ministry of Environment

Implementing Entity/Responsible Partners: United Nations Development Programme

Brief Description

This project will deliver help to reduce the vulnerability of poor people in Haiti to the effects of climate change, while at the same time conserving threatened coastal and marine biodiversity. Investments in climate-proofed and socially-sustainable BD conservation strategies, within the context of the National Protected Areas System (NPAS), will enable coastal and marine ecosystems to continue to generate Ecosystem-Based Adaptation (EBA) services; while additional investment of adaptation funds in the watersheds which drain into these ecosystems will serve to maximize BD benefits and ecosystem functions, as well as generating EBA benefits for the populations living in the watersheds themselves.

Building on the achievements of GEF projects 3616 in relation to PAs and 3733 in relation to CCA, the project will ensure sustainability by strengthening the technical and logistical capacities of the Ministry of Environment at central and local levels, and will also partner with a number of major co-financed rural development projects of the Ministry of Agriculture in order to ensure efficient delivery of CCA benefits. This will be complemented at local level by involvement and strengthening of community-based organisations in relation to PA and watershed management, and partnership with private development organisations with access to technical and financial resources to complement those of the Government.

<table> <tr> <td>Programme Period:</td> <td>2013-2016</td> </tr> <tr> <td>Atlas Award ID:</td> <td>00081100</td> </tr> <tr> <td>Project ID:</td> <td>00090545</td> </tr> <tr> <td>PIMS #</td> <td>4648</td> </tr> <tr> <td>Start date:</td> <td>March 2015</td> </tr> <tr> <td>End Date</td> <td>March 2020</td> </tr> <tr> <td>Management Arrangements</td> <td>NIM</td> </tr> <tr> <td>PAC Meeting Date</td> <td>_____</td> </tr> </table>	Programme Period:	2013-2016	Atlas Award ID:	00081100	Project ID:	00090545	PIMS #	4648	Start date:	March 2015	End Date	March 2020	Management Arrangements	NIM	PAC Meeting Date	_____	<table> <tr> <td>Total Resources Required:</td> <td>51,635,068</td> </tr> <tr> <td>Total Allocated Resources (cash):</td> <td>50,435,068</td> </tr> <tr> <td>LDCF</td> <td>5,381,970</td> </tr> <tr> <td>GEFT</td> <td>3,753,098</td> </tr> <tr> <td>Ministry of Environment</td> <td>1,000,000</td> </tr> <tr> <td>IDB</td> <td>16,900,000</td> </tr> <tr> <td>MARNDR (IFAD)</td> <td>3,000,000</td> </tr> <tr> <td>MARNDR (World Bank)</td> <td>9,000,000</td> </tr> <tr> <td>MARNDR (USAID)</td> <td>11,000,000</td> </tr> <tr> <td>UNDP</td> <td>400,000</td> </tr> <tr> <td>In-kind Contributions:</td> <td>1,200,000</td> </tr> <tr> <td>Ministry of Environment</td> <td>200,000</td> </tr> <tr> <td>UNDP</td> <td>1,000,000</td> </tr> </table>	Total Resources Required:	51,635,068	Total Allocated Resources (cash):	50,435,068	LDCF	5,381,970	GEFT	3,753,098	Ministry of Environment	1,000,000	IDB	16,900,000	MARNDR (IFAD)	3,000,000	MARNDR (World Bank)	9,000,000	MARNDR (USAID)	11,000,000	UNDP	400,000	In-kind Contributions:	1,200,000	Ministry of Environment	200,000	UNDP	1,000,000
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List of abbreviations

Abbreviation	English meaning
ANAP	National Protected Area Agency
APCCC	Building Climate Change Adaptive Capacity
ATV	All-Terrain Vehicle
BAC	Commune Agricultural Office
BCA	Boucle Centre-Artibonite
BD	Biodiversity
CARICOM	Caribbean Community
CBC	Caribbean Biological Corridor
CBO	Community-Based Organisation
CC	Climate Change
CEPF	Critical Ecosystem Partnership Fund
CIP	Caracol Industrial Park
CMBA	Caribbean Marine Biodiversity Activity
CNIGS	National Center of Geographic and Spatial Information
COSOP	Country Strategic Opportunity
CSI	South Coast Initiative
CSO	Civil Society Organisations
DDC	Directorate of Development Cooperation
DR	Dominican Republic
DRR	Disaster Risk Reduction
EBA	Ecosystem-Based Adaptation
EIA	Environmental Impact Assessment
EU	European Union
FAD	Fish Aggregation Device
FAO	Food and Agriculture Organisation
FFTP	Food for the Poor
FOPROBIM	Foundation for Marine Biodiversity
FTFN	Feed the Future North
GDP	Gross Domestic Product
GEF	Global Environment Facility
GEFTF	GEF Trust Fund
GHG	Greenhouse Gases
GOH	Government of Haiti
GRDN	Grande Riviere du Nord
HTG	Haitian Gourdes
ICCAT	International Commission for the Conservation of Atlantic Tunas
IDB	Interamerican Development Bank
IFAD	International Fund for Agricultural Development
IGA	Impact Generating Areas
IMCAWA	Integrated Management of Watersheds and Coastal Areas
IPCC	International Panel on Climate Change
IRA	Impact Receiving Areas
ISSCAAP	International Standard Statistical Classification of Aquatic Animals and Plants
ITA	Impact Transmission Areas
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area

Abbreviation	English meaning
KSBK	Caracol Bay Oversight Coordination
LDC	Least Developed Country
LDCF	Least Developed Countries Fund
LMMA	Locally Managed Marine Area
MARNDR	Ministry of Agriculture and Natural Resources
MCZ	Marine and Coastal Zone
MDE	Ministry of Environment
MEIF	Marine Enterprises Investment Fund
METT	Management Effectiveness Tracking Tool
MMA	Managed Marine Area
MOU	Memorandum of Understanding
MPA	Marine Protected Area
NAPA	National Action Plan
NEAP	National Environmental Action Plan
NGO	Non-Governmental Organisation
NP	National Park
NPD	National Project Director
NRM	Natural Resource Management
PA	Protected Area
PDO	Private Development Organisation
PIF	Project Identification Form
PMU	Project Management Unit
PN3B	Three Bays National Park
PNUD	United Nations Development Programme
PPCR	Pilot Programme for Climate Resilience
PPG	Project Preparation Grant
REDD	Reduction of Emissions from Deforestation and Forest Degradation
RESEPA	Relaunching Agriculture and Strengthening Agriculture Public Services
RPF	Resilience Programmatic Framework
RTAG	Regional Technical Advisory Group
SBA	Service Benefitting Areas
SCA	Service Connecting Areas
SEA	Strategic Environmental Assessments
SGP	Small Grants Programme
SIDS	Small Island Developing States
SLR	Sea Level Rise
SNAP	National System of Protected Areas
SONAPI	National Society of Industrial Parks
SPA	Service Providing Areas
STAP	Scientific and Technical Advisory Panel
TG	Turtlegrass
TG-PCR	Technical Group of Political Champions for Resilience in Haiti
TNC	The Nature Conservancy
TRAC	Target for Resource Assignment from the Core
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UTE	Technical Execution Unit

Abbreviation	English meaning
WB	World Bank
WFP	World Food Programme
WUA	Water User Associations

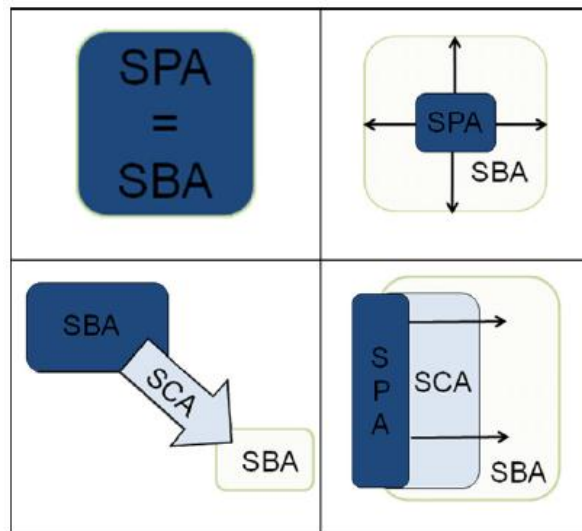
SECTION I: ELABORATION OF THE NARRATIVE

Conceptual and analytical framework

1. The two main distinguishing features of the present project are its “ridge to reef” approach, and its use of both GEF Trust Fund (GEFTF) resources and Least Developed Country Fund (LDCF) resources. The “ridge to reef” scope of the project, while posing logistical challenges, is justified by the understanding that there are flows of impacts/threats and services/benefits that cross the boundaries between mountain watersheds and coastal/marine areas, and which would fail to be addressed by projects working separately on coastal/marine issues and watershed management. The combination of GEFTF and LDCF resources similarly assumes that there are interrelations between the status of global environmental values (in this case biodiversity of global importance) and resilience to climate change. As shown in the Threats section below, these flows and interrelations are complex and involve multiple actors.

2. In order effectively to address flows of impacts and promote flows of benefits, and to optimize the distribution of benefits and the equity of trade-offs, it is essential to identify clearly where and by whom impacts and benefits are being generated and received. To this end, the analytical approach proposed by Fisher et al (2009) and presented in Syrbe and Walz (2012) is used, which involves the identification and spatial localization of Service Providing Areas (SPA), Service Connecting Areas (SCA) and Service Benefiting Areas (SBA). These terms refer to the situation which the project aims to create, wherein the provision, connection and receipt of benefits from environmental services will be optimized. In the threats analysis presented below, the same overall approach is used, but instead threat flows are conceptualized in terms of Impact Generating Areas, Impact Transmission Areas and Impact Receiving Areas.

Figure 1. Possible spatial relationships between service providing area (SPA) and service benefiting area (SBA) (according to Fisher et al., 2009):



Possible spatial relationships between service providing area (SPA) and service benefiting area (SBA) (according to Fisher et al., 2009): upper left: ‘in situ’: SPA and SBA are identical, i.e. the service is provided and benefits realized in the same area. Upper right: ‘omni directional’: SBA extends SPA without any directional bias. Lower left: ‘directional’ – slope dependent: SBA lies downslope (downstream) from SPA, i.e. the service is realized by gravitational processes (cold air, water, avalanche, landslides). Lower right: ‘directional’ – without strong slope dependence: SBA lies ‘behind’ the SPA relating to higher-ranking directional effects.

3. In the context of this project, threats and impacts are understood as human actions that directly or indirectly affect the conservation status of globally important biodiversity, or increase the vulnerability of human populations to the effects of climate change.

PART I. SITUATION ANALYSIS

National Overview

Geography

4. The Republic of Haïti shares with the Dominican Republic the second largest island of the Caribbean, Hispaniola. Haïti occupies one third (27,750 km²) of the territory on the western side of the island. It is located between latitudes 18° and 20°N and longitudes 71°30 and 74°30W. It is surrounded by the Atlantic Ocean to the north, the Caribbean Sea to the west and south, and by the Dominican Republic (DR) to the east. The total length of the Haitian coastline is 1,535km and the total area of its relatively narrow continental shelf is around 5,000km². The country also includes five satellite islands: La Gonave (670km²), La Tortue (180km²), Ile-à-Vache (52km²), Cayémites (45km²) and Navassa island (7km²).

5. Haiti is partly volcanic and partly comprised of uplifted old coral reefs (now limestone karst) several million years old. About 70% of the land area is mountainous with steep slopes and this topography continues underwater. A shallow (10 to 20 m depth) shelf typically follows the coast with a width of a few meters to one kilometer, and then there is a steep drop off. In some areas, there is a secondary shelf at 30 to 40 m, and in other areas the slope descends rapidly to from 200 m to 800 m in depth.

Social conditions

6. Haïti's population is estimated to be 8 million, with a 2.08% annual growth rate. The country is one of the most densely inhabited regions in the Caribbean, with an overall population density of 286 inhabitants/km². The population is heavily skewed toward the younger age groups: 40 % of the population is younger than 15 years of age and the median age is 20 years. Haiti's population is still more than 62.5% rural.

7. Haiti had a Human Development Index of 0.471 in 2013, the lowest in the western hemisphere and number 168 out of 187 worldwide. Between 2005 and 2010, three-quarters of the population lived below the poverty line of US\$2 per person per day, and more than half (56%) lived below the absolute poverty line of US\$1/person/day.

The agricultural sector

8. The primary sector accounts for 25% of the economy, and agriculture contributes over 25% of GDP (BRH, 2012). Agriculture is dominated by small farms, of which there are around 1 million in total, with an average of less than 1.5ha of land typically divided into several plots. The diversity of ecological conditions allows a wide range of cropping systems. The country is mostly mountainous: more than half of the land has slopes greater than 40%, while plains occupy only around 20% of the total area (around 550,000 ha). The area of land that is considered suitable for agricultural exploitation is 7,700 km² (29% of the total), however in fact around 11,900 km² (44%) are actually cultivated, meaning that around 4,200km² of marginal land, considered unsuitable for cultivation, is used for agriculture.

9. Over the last five decades, the average growth rate of agricultural production has been less than 1% (CNSA, 2012). Given that around 60% of the population lives in rural areas and around 50% of the labour force is employed in the agricultural sector, the poor performance of the sector weighs significantly on the standard of living, especially of rural households (RGA-MARNDR/FAO/EU, 2009). The weakness of the

productive system maintains much of the volatility of prices (Index of consumer prices and the exchange rate of the gourd against the US dollar), making Haiti more dependent on imports and vulnerable to price fluctuations on international markets.

10. Livestock is an important part of the production activities of most Haitian farmers, and in addition plays an important role as capital that can easily be liquidized to cover expenses.

11. Because of Haiti's topography more than 90% of the population (over 8 million people) lives in coastal areas or in adjacent watersheds. 150,000 families rely either directly or indirectly on coastal resources for income. More than 80% of the population (over 6 million people) receives at least part of their protein requirement through consumption of seafood. Fish also provide 50 percent of the protein for the country

Climate and climatic change

12. The climate of Haiti is tropical, with some variation depending on altitude. Port-au-Prince ranges in January from an average minimum of 23°C to an average maximum of 31°C; in July, from 25–35°C. The average annual rainfall is 1,400-2,000mm, but it is unevenly distributed. Heavier rainfall occurs in the southern peninsula and in the northern plains and mountains. Rainfall decreases from east to west across the northern peninsula. The eastern central region receives a moderate amount of precipitation, while the western coast from the northern peninsula to Port-au-Prince, the capital, is relatively dry. There are two rainy seasons, April–June and October–November.

13. Global climate change is expected to be manifested in the following ways in Haiti:

- a) **Increases in temperatures:** it is probable that temperatures will increase by 0.8-1°C by the year 2030 and by 1.5-1.7°C by the year 2060, with the highest increases expected in the months of June or July.
- b) **Decreases in precipitation:** precipitation is expected to decrease by 5.9-20% by 2030 and by 10.6-35.8% by 2060, with the greatest decreases also expected in the months of June or July. Agriculture on the hill lands which dominate the watersheds is principally rain-fed, and therefore highly vulnerable to variations in the timing of the rainfall rhythms which determine sowing and harvesting times. The coincidence of increased temperatures and decreased precipitation, especially in June and July, is likely to impose particularly severe stresses on agricultural systems, especially given the highly degraded nature of soils and vegetation in the target watersheds. Climate change predictions for 2050 and beyond suggest that more than 50% of the total area of Haiti will be in danger of desertification due to climate variability and change.
- c) **Sea level rise (SLR):** in neighbouring Cuba, predictions of sea level rise by the year 2100 range from 16 to 62cm, depending on the climate change scenario assumed, and similar magnitudes are likely in Haiti. Areas at most risk from flooding related to SLR are shown in **Error! Reference source not found.** SLR is of particular concern for the five main coastal cities in the country (Port-au-Prince, Cap Haïtien, Port-de Paix, Les Cayes and Les Gonaïves).
- d) **Extreme weather events:** according to the IPCC, the Caribbean region is likely to be exposed in the future to more intense and frequent extreme weather events. As a consequence of its geographic location, Haiti is exposed to many such natural risks: its vulnerability to their impacts is exacerbated by a combination of fragile infrastructure and high levels of poverty (associated with low levels of resilience of livelihood support systems). According to the National Action Plan for Adaptation (NAPA), 63% of the land in the country has slopes of greater than 20%, and 40% of land used for farming in mountainous areas has slopes greater than 50%. In recent years

(between 2001 and 2008), storms and floods have had major human and economic impacts in Haiti, with losses for the period 1997-2006 averaging 0.05% of GDP – 1.8 million people have been affected by storms (5 events) with the cost of damages estimated at US\$101 million, and almost 300,000 people have been affected by floods (4 events) with the cost of damages estimated at US\$1 million. In August and September of 2008, Haiti was hit by four major storms and hurricanes (Fay, Gustav, Hanna and Ike), with total damage and losses estimated at around US\$900 million, or around 15% of GDP.

Biodiversity in Haiti

Marine and coastal ecosystems

14. The most recent December 2011 assessment for CEPF¹ recommended a total of 31 Key Biodiversity Areas (KBAs) for Haiti, of which 14 were justified based on marine or coastal biodiversity. Parts of all three of the Proposed UNDP GEF Project Areas were included as KBAs.

15. The coast of Haiti features many different habitat types and the marine environment includes a number of different ecosystem types – often mixed. The most common coastal features are sandy beaches or rocky shores (often karst cliffs). Less common are cobble or pebble beaches. In low-lying areas with regular freshwater inflow there are mangrove swamps and lagoons. The two largest enclosed lagoons in Haiti are Baraderes in the south and Fort Liberte in the north. The three most common ecosystems are mangrove forests that extend from the high tide line to the intertidal, seagrass beds which start nearshore and underwater and may extend down to 30 m depth depending on water clarity, and coral reefs which occupy hard seabed from near shore to depths of 60 m in clear water.

16. **Mangrove forests** (covering an estimated 134 km²) occur throughout Haiti, with large stands remaining in Fort Liberte, Caracol, Limonade and Acul Bays, the Artibonite estuary, Les Cayes, Ile à Vache, La Gonave, Gonaives, Baraderes and Marigot. The northern mangals form part of the Critical Endangered Greater Antilles ecoregion. Because of their location on large islands, these support relatively high levels of endemic flora and fauna. There are close interrelations of dependency between coastal mangroves, coral reefs and seagrass beds: together, these form highly diverse and structurally complex ecosystems in which the reefs act as a barrier that shelters seagrass beds and mangroves from high wave energy; these in turn provide foraging and nursery habitats for many larvae and juveniles of reef species of fish and invertebrates including those of commercial value to fisheries.

17. **Seagrass and Algae:** Underwater, the most common shallow water habitats (< 15 m depth) are sandy seabed with or without turtle grass (*Thalassia testudinum*) or turtle grass mixed with manatee grass (*Syringodium filiforme*) and various types of algae. They represent a great source of primary productivity providing oxygen and nutrients to marine species and a means of stabilizing soft substrata. Seagrass meadows provide food for many species of herbivores especially fish and the West Indian manatee (*Trichechus manatus*). The last living manatees in Haiti were observed in the mid-1990s and they were predicted to disappear.² However, there are a few populations of manatees living in the neighboring Dominican Republic on both the south and north coasts. The Monti Cristi population is very close to the Haiti border.

18. **Coral reefs and coral communities** are distributed along important coastal zones in Haiti. They provide food and shelter for resident and migratory species, play a protection role for coastal property from tropical storm damage and offer a storehouse for potential valuable species (pharmaceuticals, commercial species). In many areas where there is hard rock seabed, both gorgonian (sea fan and whips)

¹ Timyan, JC (2011) Key Biodiversity Areas of Haiti. SAH/CEPF. 48 pp.

² GB Rathbun, CA Woods, JA Ottenwalder (1985) The manatee in Haiti. Oryx 19 (4) 234-236
DOI: <http://dx.doi.org/10.1017/S0030605300025680>

and scleractinian (reef building) hard coral communities are found alone or mixed. Most coral reefs in Haiti are in a de-stabilized condition, wherein macroalgae dominate and living hard corals are small and occupy less than 15% of the seabed due to several reasons: disease, nutrification (too much phosphorus and nitrogen) and overfishing.

19. During the 1970s and 80s, a disease killed off two important reef-building coral species throughout the Caribbean, the staghorn (*Acropora cervicornis*) and the elkhorn coral (*Acropora palmata*), that formerly occupied two entire zones of most reefs. At that time, typically 20 to 50% of each reef was comprised of these two species alone. Now, these species are rare in the Caribbean and the long-dead skeletons of the sturdy elkhorn corals can still be seen in many locations including Haiti. These species have been slow to recover in the Caribbean, however, the recovery in Haiti has been relatively faster than in most countries and patches of colonies have been counted throughout the country. In a few areas such as Ft Liberte, large colonies of elkhorn coral are common. A dramatic discovery by Reef Check in September 2014 was a very large area of healthy coral reef with hundreds of square meters of staghorn coral near Jeremie. Both of these species are now on the US Endangered Species List.

20. The conservation of marine and coastal biodiversity in Haiti is of importance from a regional perspective. Most reef corals, other invertebrates and fish reproduce by broadcast (free) spawning, followed by a lengthy pelagic larval period prior to returning to the reef to settle: the larvae may therefore travel long distances. The primary ocean currents affecting Haiti move from the southeast to the northwest: the US, Mexico, Cuba, the Bahamas and Jamaica are all downstream of Haiti and these current streams form biological corridors³ for these larvae. The staghorn coral (*Acropora cervicornis*) and the elkhorn coral (*Acropora palmata*) that were previously common in the Caribbean during the 1970s, making up some 30% to 50% of most reefs, have now almost disappeared due to a disease. Because of their rarity in the Caribbean as a whole, the high numbers and wide distribution of healthy populations of these species in Haiti are regionally significant as a potential source of larvae to help re-populate other areas downstream of the biological corridor on both the north and south coasts of the country.

21. Perhaps because of lack of competition with corals or due to genetic reasons, sponges of many species, colors and sizes are abundant on the reefs of Haiti. The biggest loggerhead sponges in Haiti are some of the largest seen in the world.

22. **Coastal wetlands** (deltas, estuaries, coastal plains and coastal lagoons) provide diverse, renewable natural resources which support mixed traditional economies based on capture fisheries, the use of forest products and gathering. Grasslands and mangrove forests support useful plants. Coastal lagoons are commonly associated with mangroves and act as nursery grounds for many species of aquatic fauna, both benthic and pelagic.

Soil and water management practices

23. As explained above, agriculture in Haiti is dominated by smallscale peasant farmers operating largely on a subsistence basis, typically operating under highly precarious conditions, on steep slopes and poor soils, and with no access to irrigation or mechanisation. Smallholder farming is dominated by the production of staple grains (maize and beans) and rootcrops, typically produced in cyclical slash-and-burn systems.

24. As a consequence of the nature and locality of these practices, problems of soil erosion and landslides are as a consequence severe in many locations (see Threats description below). Barrier methods

³ CM Roberts et al., (1997) Connectivity and Management of Caribbean Coral Reefs. Science 278, 1454.

of soil conservation have been used in Haiti for decades, in order to address the problem of runoff of water and soil particles during rainfall events, and include the following:

- Rock walls or dry walls (*murs secs*), consisting of terraces which are built along a contour and which are effective at checking cross-surface movement of water runoff and soil particles, if properly constructed and maintained. This is a common practice where rocks are easily available on the surface, but requires a significant amount of labor and time. On many mountain slopes rocks are abundant so the practice is common. A variant, known as *cordons de pierre*, is just a line of rocks running along a contour.
- Contour hedgerows: these are sometimes used in areas, such as those dominated by basaltic geology, where rocks are not so easily available. Contour hedgerows are often planted with *Leucaena leucocephala*, which is N-fixing. Hedgerows have been found to be effective at checking runoff if well managed, and bench terraces develop rapidly behind them due to the accumulation of soil particles suspended in the runoff flow. At higher elevations, *Acacia augustissima* has been found to do better than *Leucaena*.
- A variant on the above are *banje manje*, which are contour plantings of semi-perennial and long term food crops such as bananas, plantains, pineapple, and sometimes taro and cassava. There is also a practice of creating barriers with crop residues partially incorporated into the soil. Rows of forage bunch grasses have also worked including vetiver.

25. A survey carried out in the central plateau of Haiti (Virginia Tech, 2013⁴) found that about 40% of households had at least one soil conservation practice on one or more of their plots, consisting (in reverse order of frequency) of living barriers or hedgerows (42% of households), rock walls (23%), dry walls (19%), crop residues placed along the contour (7%), *biyon* (embryonic terraces) (5%), contour canals (2%) and *clayonnage* (interwoven branches) (2%). These practices tend to prioritise the combat of cross-surface water flow and the consequent loss of suspended soil particles; they do not however address the parallel issues of loss of soil water during drought events, plant desiccation due to wind, or the surface crusting and degradation of soils due to rain impact.

26. The same surveys found that:

- Plots are highly intercropped—the most common crops being corn, sorghum, pigeon pea, manioc, banana, squash, peanut and okra;
- About 40% of plots are prepared for planting with an ox-driven plough; 1% of farmers used a tractor, while the remainder used hand tools;
- Households are more likely to establish ‘live’ barriers on plots they perceive as having poorer soil, and they are more likely to establish ‘dead’ conservation practices (e.g. rock walls or barriers) on plots they perceive as having better soil;
- Land tenure status does not appear to be a significant incentive or deterrent to the adoption and use of common soil conservation practices;

⁴ Baseline study conducted by Virginia Tech team under the SANREM project between August and November 2011, before SANREM started trials with conservation agriculture practice in the area. The zone on the central plateau included the mountain regions of Bois Joli and Balandre, the foothills of Boucane Carre and Porc Cabrit, and the lowland areas of Corporant and Grand Savane. A total of 1,500 households were visited and 600 households successfully surveyed. Information was gathered on 3,282 household members, 1,914 fuel wood collection sites, 1,367 agricultural plots and 3,278 plantings

Fisheries in Haiti

27. The situation of fisheries in Haiti must be considered from a regional perspective. In its most recent review, the FAO concluded in 2011 that most pelagic species in the Caribbean are fully or overexploited. According to the FAO, the Caribbean area has a high diversity of species, particularly around southern Florida, eastern Bahamas and northern Cuba. There is also a high level of species endemism within the Caribbean. The Caribbean Sea has the highest level of species diversity in the tropical Atlantic and is considered a global hotspot of marine biodiversity (Roberts et al., 2002; Miloslavich et al., 2010). Species of interest for fisheries include molluscs, crustaceans (lobster, penaeid shrimps, crabs), coastal fishes occupying various substrata (soft bottom or reefs), large migratory fish species and deep-slope fish species. The total landings in this region increased steadily from about 0.5 million tonnes in 1950 to a peak of near 2.5 million tonnes in 1984. This was followed by a rapid decline between 1984 and 1992, and catches stabilized subsequently at about 1.5 million tonnes until 2003. They then declined further to 1.3 million tonnes in 2009. Catches of unidentified groupers show an important decreasing trend since their peak of 29,000 tonnes in 1981, reaching 7,000 tonnes in 2009. Red grouper (*Epinephelus morio*) landings have decreased more or less continuously from the maximum of 9,300 tonnes observed in 1970. The decreasing trend for Nassau grouper (*E. striatus*) has continued, with a minimum of 246 tonnes caught in 2009, most of which was declared by the Bahamas. Nassau groupers have been severely depleted by fishing and the species was listed on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species in 2003. The catches of the ISSCAAP Group 36 (tunas, bonitos and billfishes) fluctuate widely between years. The major species show a clear declining trend, although the starting year of the decline varies among species.

28. Highly migratory species (typically targeted by Fish Aggregation Devices or FADs) such as greater amberjack, blue marlin, white marlin, sailfish, albacore, and bluefin tuna are overfished in the Caribbean, with biomass below the biological threshold specified in the fishery management plan. This appears to be the case for all but dorado or dolphinfish (*Coryphaena hippurus*). Yellowfin tuna (*Thunnus albacores*) in the Atlantic was assessed with data up to 2006 by ICCAT: at that time, ICCAT did not classify the stock as overfished, however, by 2011, IUCN had classified the Yellowfin as “Near Threatened” in its Red List.

29. In Haiti, fishing is an economic activity of primary importance along the entire coast and provides some US\$50 million in annual revenue. The management of fisheries in the country has been reviewed by Caricom and described as deficient.⁵ “The Fishery and Aquaculture Service (SPA) at its central level is extremely weak in manpower and in finances. There is no statistical data collecting system whatsoever, no control and enforcement of existing legislation and no coordination of external aid.”

30. Two socioeconomic studies have been made of fisheries in Haiti but there are no actual scientific stock assessments for any species. The best data available are observations of reef fish during 1500 km of Reef Check surveys (2011 to 2014), fish catch observed in fishing boats, and observations during visits to fish markets throughout the country. In the department of Southeast, nearly 3,300 families depend directly on fishing in an area where jobs are scarce. Moreover, the fishing also supports an estimated 3,000 with indirect employment. Overall, the fishing sector sustains some 30,000 people in the Southeast or about 7% of the population.⁶

31. There are three fisheries and many fishing methods used in Haiti.

- ***Inshore bottom fishery:*** this occurs on shallow reefs and to about 15m depth. Methods include gill nets, Z-traps, hook and line, spearfishing, and hand collection of invertebrates. Boats range

⁵ FC Roest 2003. Strategic Review for Upgrading the Organizational and Institutional Arrangements and Capabilities of the Department of Fisheries in Haiti. CARICOM Fisheries Unit, Belize City, Belize, March 2003 71 pp.

⁶ Favreliere, P. (2011) Diagnostic du secteur de la pêche dans le département du Sud-Est (Haïti). CROSE. 101 pp.

from dug-out canoes to 20 m long sailboats. It is very rare to see fishermen using motorboats because of the relatively low price of fish and high cost of gasoline. Also rare is the use of motorized hookah equipment for diving. Net mesh is typically about 1 to 2cm wide and the nets are often 100m long and 3 to 5m high.

- **Deepwater bottom fishery:** this targets bottom fish and shellfish below about 15 m depth and down to 100 m. Because of the depth, this fishery uses all of the above methods except for gill nets, spearfishing and hand collection of shellfish.
- **Deepwater FADS and other:** The third fishery targets fish in deeper water using large Fish Attraction Devices (DCPs in French) in about 100 to 1000 m depth from 5 to 15 km offshore or small homemade versions in shallower waters closer to shore. The local versions use some sort of small float with a hook and bait attached below that may be tethered to the bottom or free floating.

32. The reef fish targeted by the bottom fisheries are resident on the reefs, hence fishing boats are seen clustered around reefs. This is because these fish live on the reef and make use of the reef structure to hide and feed. Semi-pelagic fish such as dorado, jacks, small wahoo and small tuna will often visit reefs to feed, but are not resident there. Truly pelagic fish such as sailfish, marlin and large tuna are not normally seen swimming near coral reefs. In his 1926 study of Haiti's fisheries, Beebe reported large sharks, dorado, jacks, barracuda, wahoo, tarpon, eagle rays were common. The fact that by 2011, not a single individual of any of semi-pelagic or pelagic species has been seen during 1500 km of underwater surveys by Reef Check of the coast of Haiti is one indication that their populations are very low on the shelf of Haiti. In his socioeconomic analysis, Favreliere noted increasing conflicts among fishermen, increasing length of nets and decreasing size of net mesh.

33. Historically, Haiti was a major supplier of live aquarium fish and invertebrates to the US and Japan. In 1982, Haitian exports of live fish and shellfish to the U.S. earned almost \$753,000, while in comparison shrimp earned only \$100,000 (NMFS, 1982). Many more fish are taken than sold. Fish mortality is high as a result of careless trapping, collecting with poisons, and subsequent handling of fish. Due to overfishing of reef fish leaving few fish and invertebrates, the primary exporter has shut down, but smaller companies apparently still collect and export animals such as sea anemones because these are advertised for sale online.

Protected areas in Haiti

34. The Environment Law of 2006 provides for the creation of a National System of Protected Areas (SNAP) and the National Protected Area Agency (ANAP). The law recognizes different categories of protected areas (PA): National Parks (NP), Forest Reserves (forêts réservées), Protected Zones (aires réservées), areas under protection with no discriminate criteria, National Monuments, and other classified sites. Haiti has 10 Natural National Parks encompassing a total of 12,854ha - equivalent to 0.5% of the country - which include approximately 15% of the remaining forest cover (estimated at 88,000ha). Haiti has 16 other PAs, which legal status will be clarified by the National Center of Geographic and Spatial Information (CNIGS) in the near future.

35. There are currently six newly declared coastal and marine PAs in Haiti – five in the south between La Cahouane and Ile a Vache, and one in the north at Trois Baies. The five parks in the south were declared under one “Arrete” (Protected Area for Natural Resource Management Port-Salut/Aquin). At this time the general objectives have been laid out in the “Arrete” publications however no detailed management plans have been completed for any park in Haiti.

Table 1. Proposed marine and coastal protected areas in Haiti

Protected Area	Area (ha)
Terrestrial protected areas	
Historical Park Citadelle	2,500
Macaya Park	8,166
La Visite Park	11,426
Foret des Pins (Unit I) Park	14,000
Foret des Pins (Unit II) Park	4,780
Marie Jeanne Cave	31
Sub-total	40,903
Coastal marine protected areas	
3 bays Park	75,618
Ile-à-Vache National Natural Park	11,235
Olivier/Zanglais Protected area management Habitat / Species	7,553
Fonds des Cayes Protected area management Habitat / Species	2,365
Pointe Abacou Protected area (Habitat / Species management)	1,840
Port-Salut Protected Natural Landscape (Marine and Terrestrial)	1,840
Plaine Cahouane Protected area (Habitat/Species management) and associated watershed	5,940
Sub-total	117,365
Total	158,268

36. Over the past 15 years, a number of prioritisation exercises have been carried out for the designation of MPAs in Haiti, but these have been based on limited quantitative data. Recent surveys⁷ have generated data allowing quantitative comparisons to be made of each area of Haiti's coast for parameters such as percentage living and recently killed coral, macro algae, numbers and sizes of key indicator fish and invertebrates. They have identified additional areas of high importance (including two of the three highest priority sites) that were not identified as potential KBAs or MPAs in previous assessments, and in fact were found in areas previously believed not to have substantial reefs. Several of the other sites had been identified previously as deserving of protection.

Because of the high diversity associated with coral reefs compared with other ecosystems, the highest priority sites are those with coral reefs in relatively good condition. In most cases, these sites also include associated seagrass and mangrove areas (Table 2).

Table 2. MPA priorities suggested by 2014 Reefcheck survey data

Name of Proposed MMA	Priority	Rationale based on Reef Check Data
Baraderes/Grand Boucan/Petite Trou de Nippes MMA	High	Highest combination of coral cover and fish numbers and diversity in Haiti. Blue Lagoon. Excellent mangrove and seagrass.
Anse Azur MMA (W of Jeremie)	High	Highest coral cover, most endangered coral species in Haiti, high numbers of fish.
Baie D'Abricots	High	Largest (oldest) coral colonies in Haiti, reef structure, larger fish, mangrove and seagrass.
Baie d'Acoul	High	Endangered coral species, islands, bays, mangrove sea grass, tourism area
Rochelois Banks	High	Sperm whales

⁷ Reef Check, 2014

Name of Proposed MMA	Priority	Rationale based on Reef Check Data
SW Corner Ile Tortug	Medium	Good coral reef, beaches
Moustique	Medium	Good coral reef, beaches
Mol/Cap San Nicolas	Medium	Coral reef, seagrass, mangroves and beaches
Petite Paradise Lagoon	Medium	Mangrove river, coral reef, seagrass, beaches
Arcadines/TrouFoBan	Medium	Coral reef, islands, beaches, seagrass
Sand cayes east of La Gonave	Medium	Coral reefs, islands, seagrass
Grand Lagoon, N La Gonave	Medium	Coral reef, mangroves, seagrass, beaches
Deheaune, S La Gonave	Medium	Patch reefs and dropoff, sea grass, beaches
Jacmel	Medium	Spur and Groove deep reefs, cliffs, beaches
Belle Anse/Anse Pitre	Medium	Cliffs, spur and groove reefs, beaches, border
Grand Goave island	Medium	Fringing reefs and beaches, seagrass
Port a Piment	Medium	Fringing reefs, seagrass, mangroves
Baies de la Croix/Spagnoles	Medium	Points, beaches, reefs, seagrass

Institutional framework

37. The two most important institutional stakeholders of the project, at central level, are the **Ministry of the Environment (MdE)**, and in particular its **National Office for Protected Area Management (ONAGAP)**; and the **Ministry of Agriculture and Natural Resources (MARNDR)**. The MdE will be the executing agency for the project. It also presides over the **National Environment Council (CONAE)**, in which different coordination and participation structures are represented. The **Inter-ministerial Commission on the Environment (CIME)** is presided by the Prime Minister and involves the Ministers of Environment, of Public Works, Transport and Communication, and of Public Health and Population. The **Ministry of Planning and External Cooperation (MPCE)** is the lead entity in relation to territorial land use planning, which is however coordinated through an **Inter-Ministerial Committee on Territorial Land Use Planning (CIAT)**.

Legal, planning, policy and incentive framework

Regional frameworks:

38. Haiti is participating in the following regional policy and strategic initiatives of relevance to CC resilience:

- 1) ***Regional Strategy for a Developing Caribbean Resilient to Climate Change (2009-2015)***. The objectives of this regional strategy are to pave the ways to countries members to build an ongoing resilience to the impacts of climate change and to emphasize on : (i) mainstreaming adaptation strategies to climate change in the sustainable agendas of CARICOM States ; (ii) promoting actions to reduce greenhouse gas emissions through energy conservation and efficiency and vulnerability of human and natural systems of CARICOM States; (iii) impulse actions to draw net social, economic and environmental benefits through a prudent management of remaining forests.
- 2) ***The Saint Marc/Haïti Action Plan of the Association of the Caribbean States***: this plan puts into action the political commitments related to the resolutions of the Hyogo Action Framework regarding the prioritization of risk considerations in national policies. As a guide to the work programme of the Association of Caribbean States (ACS) on the reduction of disaster risks, this plan aims to i) provide assistance as required at regional, national and local levels to the development and strengthening of community-based programmes for disaster risk management; ii) promote synergies between the Hyogo Action Framework and international mechanisms related to SIDS, as well as instruments to allow the strengthening of national capacities for the reduction of the effects of disasters, the development and improvement of early warning systems, technology transfer and vulnerability assessments.

- 3) **Mauritius Island Strategy for the sustainable development of Small Island Development States:** this includes a series of measures related issues including climate change and sea level rise, natural and environmental disasters, waste management, the management and protection of coastal and marine resources, and biodiversity.

National Policies, Plans and Programmes

1) Haïti Strategic Development Plan (HSDP)

39. The HSDP is structured around 4 main axes of action:

1. **Territorial refoundation**, including the identification, planning and management of new poles of development, within a framework of territorial land use planning. The *environment programme* of this axis refers to i) the securing of the environment through a network of environmental surveillance and norms, the establishment of a network of protected areas, the restoration of the natural environment, and the management and use of forests. The *watershed management programme* stresses the protection of watersheds through reforestation plans based on agroecological zoning, the construction of flood regulation structures, the dredging of rivers and drainage channels and the reduction of vulnerability to storms.
2. **Economic refoundation**. The programme on the *modernization of the agriculture and livestock sector* stresses the use of practices that protect natural resources, the construction and rehabilitation of irrigation systems and the incorporation of considerations of integrated management of watersheds. The programme on the modernization of the fisheries sector proposes basing fishing practices on studies on resource availability, as well as the promotion of aquaculture to supply national markets and promote food security.
3. **Social refoundation**: this prioritises the creation of modern social and educational networks, the protection of cultural resources, the development of civic action and a programme for gender equality.
4. **Institutional refoundation**: this proposes the deconcentration and decentralization, the review of legal frameworks, the strengthening of legislative and judicial administrations and independent institutions, and the strengthening of territorial collectivities and of civil society.

2) National Environmental Action Plan (EAP) and the Triennial Interventions Plan in the sector

40. The objectives of the EAP are to i) strengthen and rationalise the management of the environment, ii) restore the ecological equilibrium of watersheds through the implementation of norms for exploitation and best practice; iii) improve quality of life through improved management of urban and rural zones, as well as the valuation of the conservation of natural and cultural heritage; iv) provide a framework for improving coherence between plans and programmes in the environment sector. The 10 programmes of the EAP for the period 2000-2015 are:

1. Strengthening of institutional capacities for the management of the environment at different levels of governance;
2. Energy and sustainable development;
3. Information, education and training on the environment;
4. Conservation and sustainable use of biodiversity;
5. Management of strategic watersheds;
6. Integrated management of coastal and marine zones;
7. Management of risks of natural disasters;

8. Environmental health;
9. Rational management of mines and quarries;
10. Support to activities related to sustainable development.

41. The Three-Year Plan (2012-2015) of MDE identifies four areas of action, three of which are related to adaptation: 1) risk reduction, through reforestation, and the integrated management of watersheds and coastal and marine zones; 2) strengthening of environmental governance; 3) sustainable management of terrestrial protected areas and natural spaces. Its specific objectives are to i) increase forest cover from 1.5% to 5%; ii) reduction pressures on forest resources by 10%; reduce the environmental vulnerability of the populations of watersheds through the integrated management of floods and risks; iv) increase the resilience of coastal communities through actions aimed at the sustainable increase of goods and services related to coastal and marine resources; v) change Haiti from a country affected by risk to one that can live with risk.

42. The general objective of the *environmental governance strengthening* area is to promote a new environmental governance that is better adapted to the main environmental challenges in the country. Its specific objectives are to i) build environmental governance based on performance, leadership, strengthening of a consensus-based framework (the National Environmental Management System) and the legal and institutional framework for environmental management; ii) promotion of environmental management through the effective deconcentration and decentralisation of activities. The general objective of the area of *sustainable management of protected areas* is the strengthening of measures for the protection of natural terrestrial ecosystems, enabling them to play their role in resilience and adaptation, and as providers of other environmental services. The specific objectives are to i) establish the national systems of protected areas and to ensure its effective operation; ii) to promote alternative models of development for the well-being of the populations living the buffer zones of these PAs.

3) National Programme to Combat Desertification

43. The MDE has prepared a draft of the National Action Plan for the Combat of Desertification, but this has not yet been submitted to the Council of Ministers for approval. This draft addresses the cross-cutting nature of desertification and provides for strengthening of the links between the combat of poverty and of desertification. Its priorities are: i) *Strengthening of national capacities for the management of desertification*, including transfer of responsibilities to territorial collectives, the construction of databases and the operationalization of a decentralised monitoring and evaluation system; ii) *Sustainable management of natural resources*, including the protection of ecologically fragile and high biodiversity zones; iii) the *Restoration/rehabilitation of soils and degraded ecosystems* including the promotion of species and varieties adapted to climate change and ecosystem change, agroforestry and fallow management, research and fine-tuning of locally developed practices; iv) *Improvement of income and living conditions and links to local development*, with an emphasis on upstream and downstream employment creation in agricultural value chains, the creation of rural business and the improvement of market access.

4) National Plan for Disaster and Risk Management

44. The Government published its National Plan for Disaster and Risk Management (NPDRM) in 2001, which established a National System for Risk Management (NSRM) consisting of a national network, replicated departmental and municipal levels, involving public and civil society actors. The NSRM is composed of:

- The National Committee for Risk and Disaster Management, including the Ministers of the Interior, TPTC, MSPP, MARNDR, Planning, Environment, Social Affairs and Justice/Police, and the Red Cross.

- Permanent Secretariats for Risk and Disaster Management, made up of technicians from the relevant ministries, the Red Cross and selected NGOs.
- The Consultative Committee of the Civil Society and the International Cooperation Support Group
- The National Centre for Operations and Attention to Emergencies
- Departmental, Communal and Local Committees.

5) Agricultural Development Policy and the Triennial Programme of Agriculture Recovery

45. The draft Agricultural Development Policy (2010-2020), published by MARNDR in 2010, included provision for the sustainable development of agricultural productivity to ensure the protect natural resources (soils, water, forests) through the practice of integrated, conservationist and intensive agriculture that is able to reduce the vulnerability of populations to natural cataclysms. Its priority axis #5 is the preservation and management of natural resources, emphasising the accelerated readjustment of the management of watershed in humid and semi-arid mountains, and the securing of economic activities in the face of risks of natural catastrophes.

6) Fishery and aquaculture policies.

46. In 2009, the Government in Haiti, through the Ministry of Agriculture's, Department of Fisheries and Aquaculture, established the necessary conditions for investment by the private sector in order to increase over the next ten years the production of marine fisheries from 16,000 tonnes to 35,000 tonnes; pond aquaculture from 400 to 5,000 tonnes, and inland water from 600 to 10,000 tonnes. It also intends to create 70,000 jobs during this development phase and to provide its nationals with a much needed guaranteed supply of affordable fish protein. For aquaculture and mainland fishing, in the short term and medium term, the MARNDR's targets include:

Short Term:

1. Analysis of the sector and review of commercial policy
2. Assessment of resources and of aquaculture potential
3. Studies rolled out on fish processing, conservation and marketing
4. Production of fish feed

Medium-Long Term:

5. Stocking of ponds
6. Creation of aquafarms (cage and pond production)
7. Increase in the output of existing hatcheries and creation of new ones
8. Rehabilitation of existing aquafarms with higher potential
9. Provision of training and technical assistance to fishing communities
10. Monitoring and assessment of actions.

7) National Adaptation Programme and Strategy in Response to Climate Change

47. Haiti developed its National Action Plan (NAP) in line with UNFCCC requirements. This included 8 priority actions:

1. Conservation of watersheds and lands;
2. Management of coastal zones;
3. Promotion and preservation of natural resources;
4. Preservation and improvement of food security;
5. Protection and conservation of water;
6. Construction and rehabilitation of infrastructure
7. Waste management
8. Increases in awareness through education and information.

48. There is no National Policy on Climate Change or National Strategy for Response to Climate Change as such in Haiti: the requisite elements do exist that would enable these to be developed, but these have not been organized or systematized, or the required consultative processes carried out.

Target areas

49. The project will focus at field level on three selected “PA/watershed complexes”. The model of “PA/watershed complex” is based on the spatial perspective of “Service Providing Areas (SPA), Service Connecting Areas (SCA) and Service Benefitting Areas (SBA)” posited by Fisher et al (2009) and presented in Syrbe and Walz (2012); and their corollaries Impact Generating Areas (IGA), Impact Transmission Areas (ITA) and Impact Receiving Areas (IRA) (see the explanation of the conceptual and analytical framework in paragraphs 1-3 above).

50. Any given PA/watershed complex is intended to encompass both the IGA and IRA of each of the priority threats that are identified, thereby enabling the threat in question to be attacked “at source”. In the case of upstream-downstream hydrological threats affecting coastal ecosystems, for example, the IGA is the mountain range that drains into the coastal ecosystem (the IRA): here the upper limit of the target area would logically be the watershed boundary, while the lower limit would be the affected coastal ecosystem (the “ridge” and the “reef” respectively in the “ridge-to-reef” approach). However, as shown in Figure 1, there are in reality a range of different possible spatial relationships between service providing/impact generating areas (SPA/IGA) and service benefiting/impact receiving areas (SBA/IRA), so the target areas are not always necessarily defined by watershed boundaries; furthermore, where the target area defined in biophysical terms forms part of a large political unit, it may make sense to use the boundary of that political unit to define the target area.

51. The target areas were selected in accordance with the following criteria:

- Existence of globally important and threatened coastal and marine biodiversity
- Prioritization by the Government for the establishment of PAs, based on analyses carried out within the context of the GEF PA strengthening project.
- Evidence of vulnerability of local people to the effects of climate change.
- Evident links between the condition of coastal and marine ecosystems and the ability of local communities to withstand and adapt to the effects of climate change.
- Evident links (direct or indirect) between the condition and management of watersheds and the condition of coastal and marine ecosystems
- The existence of a solid baseline of institutional activity and/or significant opportunities for collaboration with other institutions/funding agencies in order to optimize the incremental impact of GEF and LDCF funds.

52. Despite its site-specific focus on these three areas, the project will generate systemic benefits by generating lessons and systems for the effective management of watersheds and coastal and marine ecosystems, which will be replicable throughout the country. It will therefore place a strong emphasis on the systematization and institutionalization of experiences and the strengthening of institutional capacities in key Government ministries and NGOs who are capable of replicating the lessons and experiences nationally.

Complex 1: The Three Bays

53. This complex is located in the northeast of the country: it extends along the north coast from Limonade Bay in the west to the Lagon des Boeufs close to the border with the Dominican Republic, and inland to include the catchments of the tributaries of each bay. It includes coral reefs, turtle grass areas, mudflats, wetlands, an extensive flat coastal plain covering an area of about 550 km² (now under

development for mechanized agriculture), and to the south, several ranges of hills which mark the southern limit of watersheds that generate the three main rivers that flow north to the sea. These include the Grande Rivière du Nord—which discharges just to the west of the Limonade Bay; the Rivière Trou de Nord—which runs through the town of the same name and discharges at Caracol; and the Rivière Marion which discharges into Fort Liberté Bay just to the west of the town.

54. Seven watershed areas can be identified in this complex:

- 1) The Grande Riviere du Nord (GRDN) watershed: the GRDN rises in the hills about 60km to the south east of Limonade in the region of Valierre, and flows northwest through a well-defined valley in which lie the towns of Ranquitte, Bahun and the town of Grande Riviere du Nord itself. The limits of the watershed are defined by two prominent ranges of hills running NW to SE on both sides of the watershed.
- 2) A catchment area to the east of Limonade that includes several small rivers and streams that discharge into a broad wetlands area to the west of Caracol
- 3) A relatively small watershed discharging into the Bay of Caracol to the west of the town.
- 4) The major watershed of the Trou de Nord river which discharges close to Caracol.
- 5) The largest of the seven watersheds which surrounds the River Marion that discharges to the west of Fort Liberté. Several smaller rivers also run through the watershed discharging into the Fort Liberte bay farther to the west.
- 6) The most eastern of the watersheds that discharge into the sea north of the plain.
- 7) A complex of watersheds which run north-east towards Ouanaminthe and which all discharge into the Massacre River.

55. The Bays of Caracol and Fort Liberté in Haiti, together with the Monte Cristi in the neighbouring Dominican Republic, form one of 22 Ecologically or Biologically Significant Marine Areas (EBSAs) that have been identified throughout the wider Caribbean and western mid-Atlantic⁴. The Bays of Limonade, Caracol, and Fort Liberté and the Important Bird Area of Lagon-aux-Boeufs, Caracol Bay have been proposed by the Ministry of Environment for the establishment of a new marine protected area, which would be a component of the Caribbean Biological Corridor under the protocol concerning specially protected areas and wildlife (SPAW). Caracol Bay area includes an estimated 3,900ha of healthy mangroves (approximately 18% of the remaining mangrove in Haiti), eel grass beds, and a sheltered bay protected by a coral reef that extends over 20 km. The mangroves are harvested for charcoal and cleared for salt pans but are still extensive and relatively well conserved.

56. The bay at Fort Liberté is ringed with extensive mangrove stands, and much of the shallow portion of the bay is home to an unusual coral/turtle grass zone, while there is a turtle grass-only zone that occupies most of the deeper center of the bay. Because of the relatively low human population in this area, the water quality in the bay is still quite high (CTEC, 2012).

57. The reefs located outside the channel of Fort Liberte are typical exposed fringing reefs. These reefs are exposed to daily 1 – 2 m swell generated by the trade winds that typically blow from the northeast at 10 to 20 knots every afternoon. When hurricanes pass along a track north of Haiti, these reefs are exposed to much larger waves causing the formation of a spur and groove structure on the outer reef slope. The percent substrate cover for hard coral ranges from 9 to 21%, soft coral from 0-2%, nutrient indicator algae 21-44% and sponges 1-10%. The reefs are home to threatened coral species *Montastraea annularis* and *M. faveolata*, listed under the US Endangered Species Act, and dozens of colonies of the endangered staghorn coral *Acropora cervicornis*: in fact all of the proposed eight proposed Endangered and Threatened species of corals are found at these sites. This constitutes a significant population of healthy

specimens of this now rare species, of regional significance because these colonies are a source of reproduction via planktonic larvae which travel between countries.

58. The reefs located inside the channel at Fort Liberté also have a medium level of coral cover, coral diversity and both large and small colonies. Moving into the channel, the living coral cover and diversity decrease further until, about half way towards the bay the fringing reef starts to break up into reef patches located on rocky points. Algae, sponge and silt increase in percentage cover. Two corals proposed for ESA listing as endangered, *Montastraea annularis* and *Montastraea faveolata*, are common inside the channel. Some large coral colonies of other diverse species including brain coral are common. The coral cover inside the channel is below average for reefs in Haiti, but the diversity and percent cover of sponges is very high for Haiti and compared to the rest of the Caribbean. The sponge communities in Haiti are so diverse and include very large colonies such that they provide habitat and structure similar to coral reefs

59. Where the channel meets the bay at Fort Liberté, there is very little rocky bottom as it is dominated by sand, silt, sponge, algae and turtle grass, with typically just five species of scleractinian corals remaining on these rocky patches, *Favia fragum*, *Siderastrea siderea*, *Meandrina meandrites*, *Manicina areolata*, and *Porites astreoides*. This situation holds on exposed rocky patches throughout most of the shallow areas of the bay (<3m). However, in the shallow turtle grass beds, which occupy a large portion of the bay (see habitat map below), colonies of a thin branching coral *Cladocora arbuscula* occur at densities exceeding 1 colony per square meter creating an unusual combined turtle grass with coral community habitat. Much of the innermost bay is occupied by stands of large mangroves covering an estimated total area of 2 km². The prop roots of the red mangroves form a habitat for large numbers of small fish such as *Gerrus* spp. and juvenile snapper and grunts, and are a nursery for many other species of juvenile fish.

60. Reef Check indicator fish families and species were recorded at all PPG survey sites around Fort Liberté. Each indicator fish was observed at least one time however the abundance was low for all as is typical in Haiti, and the sizes were small, typically less than 15 cm. The one exception was the presence of several Nassau Grouper (*Epinephelus striatus*) – an unusual record anywhere in the Caribbean, and the first recorded by Reef Check in Haiti. The number and small size of the fish living on Fort Liberte reefs indicates that overfishing is a problem at these sites.

61. Despite the fishing pressure at Fort Liberté, the results of the PPG surveys of invertebrates revealed the presence of several lobsters – even in the shallower depths. Given that lobsters are the top prey item for spear fishermen, this indicates that Ft Liberte is quite a productive area. The relatively large number of Flamingo Tongue gastropods is another indicator of the number of gorgonian sea fans found at this site as they are obligate corallivores. The number of long-spined black sea urchins is low on most of the reefs, adding to the problem of lack of herbivory to crop the macro-algae. The numbers of pencil urchins on some transects was quite high suggesting little curio collection (consistent with the Flamingo tongue results).

62. To the west of Fort Liberté, the bays of Caracol and Limonade are actually just one bay with a mangrove forest projecting into the middle and a barrier reef running across the top. PPG surveys found the main habitats to be seagrass, coral reef and mangroves (which are cut regularly for charcoal). There is a virtually continuous barrier reef running along the whole coastal margin of the bay, interrupted by a single cur (through which over 100 fishing boats typically leave each morning), with a parallel and contiguous narrow strip of algae and silt on its landward side, behind which most of the rest of the bay is dominated by sand and turtle grass. On the southwestern and southern sides of the area are located large expanses of mangroves.

63. At the eastern end of the Three Bays complex is the brackish Lagon aux Boeufs), which is separated from the sea by estuarine mangroves. This area was not surveyed during the PPG phase, but *Tilapia* fish were introduced into this lagoon for extensive aquaculture for food 15 years ago⁸. Given the voracious appetite of *Tilapia*, it is unlikely that any small endemic aquatic organisms would have survived.

64. Overall, the combined mangroves, eel grass beds, reefs, and bay habitats of the Three Bays complex are important nurseries for economically important fish, crustaceans (including lobster and shrimp), and mollusks (including conch). This area is crucial for subsistence fisheries for local communities and provides several additional provisioning and protective environmental services. The mangroves and reefs serve to protect the low lying plains from storm surges. In particular, the mangrove forests of the Caracol and Fort Liberté Bays play an important role in the reproduction cycle of numerous coastal and pelagic fish species, including those important for human consumption such as the pike (*Centropomus undecimakis*), prawns and lobsters (*Penaeus* spp. and *Panulirus argus*) and molluscs (*Strombus gigas*). At least 13 species considered either threatened or seriously in danger of extinction have been identified as inhabitants of mangrove forests and lagoons of the area. Among those are the American crocodile (*Crocodylus acutus*), the Atlantic leatherback sea turtle (*Dermochelys coriacea*), the Atlantic Hawksbill sea turtle (*Eretmochelys imbricata*) for reptiles, and the Flamingo (*Phoenicopterus ruber*), the black-crowned palm tanager (*Phaenicophilus palmarum*), the northern mockingbird (*Mimus polyglottos*) and cave swallow (*Hirundo fulva*) for avifauna. Of these, the black-crowned palm tanager is endemic to Hispaniola and the cave swallow is endemic to Haiti. Caracol Bay and its offshore area are also important for whales, manatees, sea turtles, and migratory birds. The environmental services provided by Caracol Bay have been estimated to have a total value of US\$110M per year.

Complex 2: Cayemites-Barradères

65. This complex is located on the northern coast of the south-west peninsula of the country. Its marine area is largely defined by the limits of the main area of coral formations on this coast, extending from the coastal town of Corail in the west, and encompassing the Cayemites Islands and the Baraderes peninsula, as far as the town of Petit Trou de Nippes in the east. Its terrestrial area comprises the watersheds that drain into this marine area; its boundaries are defined by the limits of the Communal sections situated between the coast in the north, and the Departmental line to the south (which coincides with the main ridge line running east-west along the centre of the peninsula. The western limit is marked by the western edge of the Corail Commune Sections of Champy and Fond d'Icaque; the eastern limit by the eastern edge of the Communal Section of Tiby. Defined in this way, the zone has a population of more than 106,000 and covers an area of 586.6 km².

66. Its topography is dominated by the coastal features: the Cayemite islands and the Baraderes peninsula, which are both low-lying and relatively flat coastal zones. In its terrestrial part, the wooded hills of the mainland rise quite steeply from the coast before descending into a series of valleys running east west from Corail to Pestel, and from Pestel to Baraderes. The road into Pestel from the south runs along a short saddleback between these two lowland areas. Further south, the terrain rises almost interrupted towards the highlands of the Massif de la Hotte, a highland chain running east-west which marks the southern boundary of the Grande Anse administrative Department. The southern boundary of the Grande Anse Department is aligned along the highest ridge of the watersheds that descend to the north, however there are almost no watercourses between Corail and Pestel: the first significant river along the coast rises in the hills to the south of Baraderes, before passing close to the town and discharging into the Baraderes Bay.

⁸ Dr. Celestine Wilson, National University of Haiti, pers. comm.

67. An important topographic feature of the area is the lowlands to the west of Pestel and south of Corail. These mark the limit of the descending terrain from the Massif de la Hotte to the South and turn the watercourses flowing north from the Massif to the west to be discharged into the sea west of Corail. The coastal zone from Corail to Pestel and east to the start of the Baraderes peninsular is bounded by a low chain of hills (alt: 400 m) that rise steeply from the coast before dropping off into the lowlands about 5 km to the south. Only the saddleback ridge where the road passes through to Pestel interrupts this low ridge of hills.

68. The mainland zone of the area is composed of eight catchments:

- 1) The coastal zone between Corail and the western limit of the Baraderes Bay: this is a coastal strip of wooded hills that rise quickly to about 400 m before descending to the flatlands to the south. Many small rivers and streams flow down the hills to the sea but all the watercourses are short (1-2 km)
- 2) The large watershed that runs from the ridge of the Massif de la Hotte (at over 1,000m) down to the lowlands in the area of Bois Mapou, Conette, and Fond Ragé. Blocked by the low range of east-west hills along the coast, the lowlands drain to the west and then north into the sea just to the west of Corail.
- 3) A small sub-watershed that covers the lowland flats between Pestel and Baraderes Bay.
- 4) A small catchment area contiguous with eastern edge of watershed no. 1
- 5) A well-defined watershed that drains into a river that enters the bay to the west of the Baraderes River
- 6) The principal watershed of the Baraderes River, providing inputs of freshwater and sediment that have allowed the development of a sizeable area of mangroves on the south of the Baraderes Bay.
- 7) A catchment area containing several small watercourses that drain into the Baraderes bay
- 8) A small subwatershed just to the west of the town of Petit Trou de Nippes

69. The topography of the terrestrial part of the target area is complex and highly dissected, and the geology is dominated by karst (highly permeable limestone with rocky outcrops): as a consequence, there are limited numbers of surface watercourses. The limited size of most of the catchments (with the exception of 2 and 6 above) also means that what watercourses there are are mostly very small. Given these apparently limited upstream-downstream interactions, the limits of the target area will be defined more on the basis of the social and productive relations between the coast and the land, than on hydrological dynamics. Rather than defining the terrestrial limits of the target area through the simplistic application of the “ridge to reef” concept (which would imply extending it as far as central watershed divide of the peninsula, where the Macaya National Park is located), it is therefore defined instead by the boundaries of the political units (communes) that border the target coastline.

Biodiversity

70. This target area has been identified as one of Haiti’s Key Biodiversity Areas⁵. The Gray-Crowned Palm Tanager (*Poliiocephalus phaenophilus*), the only bird endemic to Haiti is found in this KBA. Several live-bearing fish species of the *Limia* genus are Hispaniola island endemics that occur in fresh and brackish water bodies including *L. dominicensis*, *L. meloanogaster*, *L. melanotata*, *L. nigrofasciata* and *L. tridens*. Two reptiles are endemic to the Cayemite islands: *Amphisbaena caudalis* and *A. caymite*. The purple copepod, *Mastigodiptomus purpureus*, VU, is found in freshwater systems of Haiti, but the extent of its range remains uncertain. This KBA also borders onto the Massif de la Hotte KBA.

71. Although the standard Reef Check indicators were found during PPG surveys not to be abundant in this area, large schools of 15 to 20 cm fork length doctor fish (Acanthuridae), some snapper (Lutjanidae) and parrots (Scaridae) were observed. It is likely the low human population level and the very poor, dead-

end road has preserved these reefs compared to other more populous areas of Haiti. It appears that the high quality reef may continue to the east of Petite Trou de Nippes for several kilometers but surveys were not made of this area. Similarly, the abundance of Reef Check invertebrate indicators was low at most sites, indicating that that level of fishing and collecting is high in these areas relative to the ability of these organisms to reproduce and replace themselves, but overall the good condition of the reefs indicates that the fishing effort is relatively low for Haiti.

72. During PPG surveys of the bay formed by the Baraderes peninsula, it was observed that the seawater became progressively greener with plankton towards the west of the bay, indicating less water movement and more terrestrial nutrient input (eutrophication). At the extreme western end, however, there is a clear deep blue lagoon, apparently a result of underground seawater flow from the other (western) side of the isthmus connecting Baraderes Peninsula to the mainland, possibly through underground tunnels. PPG dive surveys found schools of hundreds of grunts (*Haemulidae* -- fork length 10 to 15 cm) and sergeant majors, but few invertebrate indicators. There was low diversity, but good quality coral reef with large colonies of *Diploria* down to 15m ending in a sandy seabed. Many jellyfish were found (*Mastigias* spp. and *Phyllorhiza punctata*), so the system appears similar to other salt water “lakes” such as in Palau. Due to the beauty of this site both underwater and above, this is a potential world-class tourism site.

73. The coral cover maintains a relatively high value traveling west around the top of the Baraderes Peninsula and Cayamites, but fish numbers and sizes decrease moving towards Corail. On the north side of Cayamites, the water drops to about 500m depth within 100m of the reef wall. The reef has a lot of vertical relief with large (10m high) ridges and runnels with reef slope from 20m up to 6m depth. Some medium-sized 30cm snapper and a few medium size jacks (30 – 40cm) were counted. It appears that the reef is similar ridge/runnel all along that stretch of Grand Boucan/Baraderes peninsula coast. The inside of Baraderes Bay and south of Grand Cayamites the seabed is almost 100% turtle grass except where small islets are exposed.

74. Turtlegrass (TG) covers the entire shallow shelf of Cayamites around the island to the west coast. The shelf between Petite Cayamites and Cayamites is quite shallow (often 3 to 6m) and 100% TG again, a situation which continues all the way to the tip of Petite Cayamites. The outside “barrier” reef northwest of Petite Cayamites is not shown on the charts but is an extensive and well-developed coral reef (what shows on Google Earth is only a small portion of the entire reef). The deep reef extends for at least 500m north in front of the barrier reef and runs the length of the barrier reef. The reef is well developed with very large bommies of eg. *Monastrea annularis*, *Diploria* spp. and others. The reef has been severely overfished with very few fish remaining. The shelf is very wide in front of the barrier and extends in depth from 0 to more than 30m. The shelf drops to 400m very quickly to the north so lots of water exchange. Some “ghost” long lines with 3cm long multi hooks were observed on the reef. According to local fishermen, the area is fished with hook and line and spear.

75. West of Pestel, the nearshore area is turbid with fine, white, resuspended matter which blocks visibility, and the seabed is 100% TG up to within 3m of the karst shore. The entire bay is 100% TG right up to 5m from the karst shore, where there are some small coral heads of tolerant coral species such as *Siderastrea*. The reef at Cayamites NW is just opposite the sizeable fishing village of Anse du Nord. This reef is the eastern end of the deep barrier reef that extends from Cayamites to Corail well offshore. The reef is fairly low profile but with extensive coral development and cover, but very few fish. The islands and patch reefs to the west of Cayamites have a thin band of coral on their northern side. The rest of the seabed is TG, algae and sand on this very shallow shelf, and it is assumed this extends in to Corail.

76. The outside reef at north of Corail is similar to the site at Cayamites NW. It is a large well-developed reef with a lot of living coral. It has been heavily fished and almost no fish were observed. The

fish sizes were slightly larger (10cm) than at the Cayamites site extending out to about 16m depth. The seabed drops to 400m just a few dozen meters seaward. All these reefs are poised to shift into algal domination mode soon without intervention.

Production and livelihood support systems

77. The lower slopes above the coastline of the mainland of the area around Pestel are dominated by a tree-rich agroecosystem. Here, crops such as cassava, plantains, beans, sweet potatoes, yams and maize are grown beneath varying densities of tree shade; in some areas of intermediate altitude, coffee is grown beneath tree shade. Cassava is one of the most important crops, and its processing is an activity that is largely dominated by women: opportunities for realising the economic potential of the processed cassava are limited by the poor condition of the road infrastructure. The tree component of the agroecosystem consists of diverse native and exotic species, including trees of livelihood importance such as breadfruit, coconut and mangoes.

78. Higher areas, by contrast, are dominated by scrubby secondary vegetation with very few tall trees. Here, annual crops such as yams and sweet potatoes are grown in plots cleared on a cyclical basis and subsequently allowed to return to fallow; and plantains or bananas are grown close to houses. Farmers in this area typically plant their rootcrops in mounds, as an apparent strategy for increasing available rooting depth and conserving moisture. In parts of this area, soil rockiness (due to the karst geology) is extreme, and farmers are obliged to sow their crops in the pockets of soil that occur between the rocks.

79. Another implication of the karst geology of the area is a severe scarcity of surface water for human consumption: most of the houses in the area have tanks to hold rainwater collected from their corrugated iron roofs, but the storage capacity of these is typically insufficient to see families (and their animals) through drought periods, which may last up to 6-7 months. At Cayemites Islands and coastal communal sections, the majority of families have built their places of residence on the coast, which puts them in a very vulnerable position in relation to flooding and high tide phenomena.

80. In the Baraderes/Nippes area to the east, agriculture and trade are the dominant economic activities, and agriculture is dominated by livestock production (cattle, goats, sheep, pigs, donkeys, and poultry in particular). Barradères has trade relations with other cities such as La Gonâve, Cavaillon, Cayes, and Port au Prince Miragoâne. Previously, bananas, lime, coffee and cotton constituted the mainstays of the agricultural production in the area; today, the main crops vary widely between different parts of the area, including coffee, bananas, beans, yam, cocoa, cassava, sugar cane in particular, with rice being produced in certain flood zones. The town of Baradères has historically been an important centre for the production of taro (*Colocasia esculenta*), however this has declined in recent years due to viral problems.

81. In focus group meetings held during the PPG phase, farmers in the Baraderes/Nippes listed a number of productive challenges. They consider their agricultural systems to be archaic, characterized by factors such as: inadequate access to tools and equipment; absence of irrigation, despite the opportunities that exist in the area, meaning that they are totally dependent on the vagaries of rainfall; limited knowledge on the efficient and sustainable management of soil fertility; and bad practices in pest control, including the use of burning as a means of protection against insects. They also mention organizational and marketing limitations, including inadequate road infrastructure which means that a large proportion of fruit production is wasted, lack of access to milling facilities which would allow them to add value to sugar cane, and price competition with cane syrup produced in other towns nearby.

Complex 3 : Marigot – Massif la Selle – Anse a Pitre

82. This zone is located at the eastern limit of the South-East Department of Haiti close to the border with the Dominican Republic (DR). It is bounded in the west by the Communal Section Corail Sault, and in the east by the DR border. The upper limit of the watersheds runs parallel but a little higher than the

Departmental boundary, which aligns east-west below the ridgeline of the highland plateau on which are located the pine forests that are enclosed by two of Haiti's national parks. From the ridge to the coasts, the zone consists of a series of contiguous major watersheds oriented north-south along the coast. The rivers rise in the highlands of the Massif de la Selle and descend almost directly to the south coast of the island. The largest river, the Pedernales, marks the DR boundary.

83. The zone has eight major watershed areas:

1. The watershed that encompasses the hydrographic systems above the town of Marigot. The upper limit is the high plateau of the Massif de la Selle;
2. A complex of smaller catchment areas that drain into the sea on the southern coast between Marigot and Belle Anse. There are no major towns on this section of the coast;
3. A relatively small watershed that encompasses the hydrographic system above the town of Belle Anse;
4. A catchment area running ridge to reef but in an area of lesser importance;
5. A complex of watersheds that discharge from a coastal zone where coral reefs systems are important;
6. The catchment area for the coastal town of Grand Gosier. The watershed captures runoff from a extensive upland zone along the ridge of the Massif de la Selle;
7. A coastal zone of micro-catchment areas bounded to the north by a range of hills that runs southeast towards Anse à Pitre;
8. The western part of a large watershed that drains into the Pederales river. The river marks the DR border. Only the Haitian half of the watershed is shown on the map. The town of Anse à Pitre is built on the flood plain and is only about 1 km to the west of the mouth of the river.

84. The Massif de la Selle, located in the southeast of the country near to the border with the Dominican Republic, contains Haiti's highest peak 'Pic la Selle' (2684 m) and the second most biodiverse region of the country after the Massif de la Hotte. It was declared as a Biosphere Reserve in 2012. The total area of the Biosphere Reserve is 377, 221ha (land 360,434ha; marine 16,787ha), comprising a core area of 52,579ha, a buffer zone of 66,116ha and transition areas of 258,526ha (land 241,739ha; marine 16,787ha).

85. The area has a great diversity of landscapes and ecosystems: it includes rainforests, mountain pine forests, deciduous forests and high-altitude dry forests. The coastal landscape is dominated by marine coastal ecosystems such as mangroves, lagoons, estuaries and deltas. Most of the endemic species are flowering plants of which 16% are endemic to this region, and the area contains over 60% of the threatened species in the country. The area has 22 species of amphibians and 41 species of reptiles, from which two are endemic to the Massif de la Selle. The Jacmel Depression, which is the geological boundary between Massif de la Hotte and Massif de la Selle, is a significant factor in the distribution of threatened endemic species in Haiti.

86. Surveys carried out during the PPG phase show that most of this coast is comprised of beaches, and easily eroded limestone soils that are regularly exposed to wave action from south swells, and occasionally, hurricane waves. As a result high turbidity is chronic in many areas of this coastline (the water looks milky due to fine white silt and clay particles), however the sediment load may not be very high. Six sites were found with coral reef along this coast, between Belle Anse and Anse a Pitre. The remaining underwater habitats along this coast are primarily sand and silt seabed with algae and turtle or eel grass.

87. The coral reefs along this coast follow a standard structure. They occur principally opposite rocky coast where there is not too much fine limestone. There is a thin band of coral up to 30m wide growing on rock down to 6 – 8m. Then there is sand and turtle grass on a very low sloping plateau. About 750 to

1000m from shore, coral reef ridges and runnels develop in about 10m depth and extend more than 100m further offshore and to 30m depth in some areas. At about 15m depth, the slope increases more steeply down to a sandy bottom sometimes covered in algae or turtle grass.

88. Similar to most reefs in Haiti, the southeastern reefs are destabilized by a lack of herbivory such that macro-algae cover 35 to 55 percent of the reef surface. Living hard coral only occupies between 4 to 8%. Some reefs are dominated by the calcareous green alga *Halimeda*. There are very few RC indicator fish on the reefs, mostly butterfly fish, parrotfish and grunts and all are small sized. Some schools of dozens of small doctor fish were observed. Due to the proximity to very deep oceanic waters (600 m depth) within a few kilometers of shore, some immature pelagic fish such as mackerel and small tuna were seen swimming near the reefs. Most reefs also lack sea urchins, but a few in shallow water have relatively high sea urchin populations and these have almost no macro-algae.

89. The FADs appear to be helping to keep fishermen off the reefs. Regular catches of dorado and immature marlin were observed in boats returning from fishing.

Gender issues

90. Participatory workshops were carried out in all three target areas during the PPG phase in order to gain an understanding of gender-differentiated aspects of natural resource management that may need to be taken into account in project design.

91. In all the target areas, it was found that women typically play important roles in domestic, commercial and agricultural activities. They take care of the house, clean, wash clothes, prepare food, carry water and buy food and other commodities; they also sell garden produce, food and other products outside of the home, and often work as itinerant traders who expand the purchasing power of household income by investing cash in small household resale activities. In general, women with husbands do not participate in land preparation and weeding, but women are considered essential in planting and much more for the daily collection of products and seasonal crops. Indeed, the harvest is considered the exclusive domain of women and is usually coordinated by the senior woman of the household. Men who have no wife will rely on their mother, sister or daughter to harvest and sell the products.

92. Men work in the gardens, take care of livestock, produce charcoal and collect firewood. The most demanding tasks, such as hoeing and digging holes for bananas are considered men's jobs, while the lighter work such as covering holes and collecting debris from a weeded garden is carried out by women. Men help with food processing activities, such as shelling millet, beans and corn. Men build houses, and all tasks related to the construction of a house, such as woodworking and stonework, are male tasks; however women are responsible for house repairs and maintenance. Men, and to a lesser extent women, migrate to the city in search of temporary employment opportunities.

93. The most significant implication of these examples of the sexual division of labor is that men rarely engage in domestic work of women, whereas women may perform both "male" and "female" activities: men do not normally wash clothes, prepare meals, clean the house or go to market, and rarely carry water, while women often take care of the livestock, weed gardens and collect fire wood. Some women, especially older women, independent economically, hoe the ground and, on rare occasions dig holes for the banana.

94. An academic study⁹ carried out in Foret des Pins National Park, in the southeast target area, found that gender is associated with conservation behavior: female farmers are more positive than male farmers

⁹ Dolisca, Frito, McDaniel, Joshua M., Shannon, Dennis A. and Jolly, Curtis M.(2009)'A Multilevel Analysis of the Determinants of Forest Conservation Behavior Among Farmers in Haiti', *Society & Natural Resources*, 22:5, 433 — 447

toward participation in forest conservation activities. This finding is similar to that of Tindall et al. (2003), who reported that women have stronger ecocentrism and stronger personal responsibility for improving the environment than males. Age, meanwhile, had a negative impact in explaining farmers' participation in forest conservation programs. This implies that younger people are more willing to participate in forest conservation activities. A close examination of the study area provided insights for this result. Older farmers are mainly interested in collecting forest resources, while young people are willing to participate in and contribute to the process of decision making affecting forestry programs.

BASELINE SITUATION

Threats

95. The project will address threats of two kinds: those that increase the exposure of the country's population to the impacts of climate change (the climate change impacts themselves are described in the previous section), and those that affect the conservation status of globally significant biodiversity. As shown schematically in Figure 2, the activities that constitute these threats are carried out both in coastal and marine areas and in the watersheds that drain into them, and are interrelated in numerous and complex ways (the bold arrows in Figure 2 represent flows of impacts that spill over from watersheds into coastal and marine areas). The maps (see Map Annex) show the generalized locations of the Impact Generating Areas, Impact Transmission Areas and Impact Receiving Areas (see 2) in each of the three target areas.

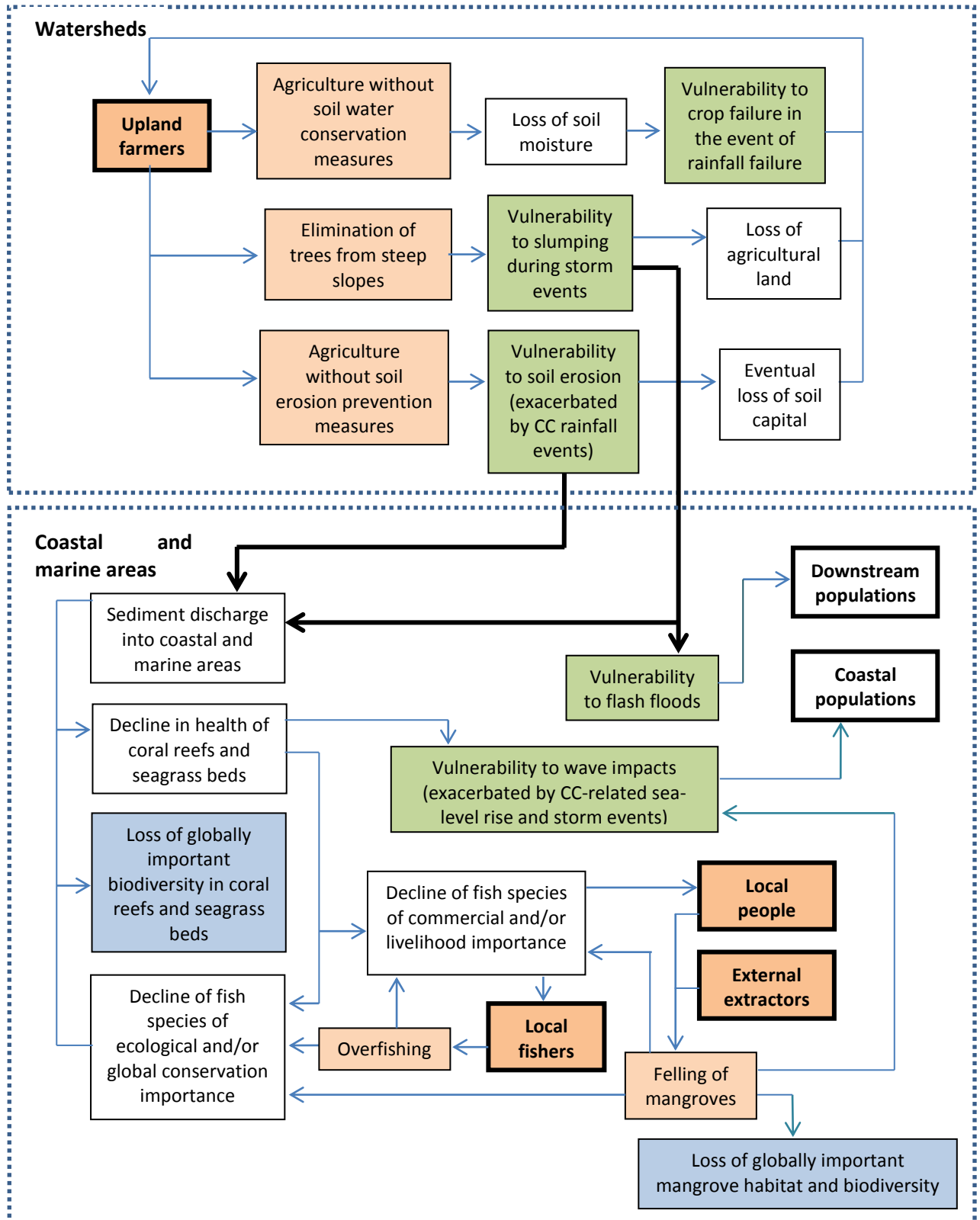
96. The threats analysis presented below also shows that there are close and complex interactions between, on the one hand, underlying poverty and, on the other, the loss of biodiversity and the increase in vulnerability to the effects of climate change. "Poverty" in this case implies limited access to most or all of the forms of livelihood capital recognised in the sustainable livelihood framework (DFID, 2002), which in turn limits the opportunities open to the rural poor for changing their currently damaging and unsustainable practices:

- **Limited financial and social safety nets** typically lead to risk aversion and short time horizons in farmers' decision-making, limiting their inclination to invest in sustainable land management;
- **Limited financial and physical capital** restricts the livelihood support alternatives open to fishers, meaning that the resource is pressured to the point of collapse by thousands of operators;
- **Limited social capital** means that impacts flows between different stakeholders, and between individuals and the community as a whole (for example, the felling of mangroves by external actors, with negative implications for fish stocks and CC resilience) are not subject to effective sanctions;
- **Degraded natural capital** limits the benefits attainable from the productive and extractive activities on which most rural people depend, while at the same time (in a vicious circle) reducing the viability of the alternatives.

Poor watershed management

97. Management practices on upland farms generate negative impacts that affect the farmers themselves and in some cases also affect populations and ecosystems downstream. **Cultivation without using soil cover or protection against wind** can expose farmers to crop failure in the event of irregularities in rainfall patterns, given that agriculture in the target areas is overwhelmingly rain-fed. This threat is primarily of relevance to climate change resilience (CCR), and is self-contained within the farm; it is a "business as usual" threat because rain-fed agriculture is already susceptible to the normal fluctuations in rainfall patterns, but is likely to assume increased significance as rainfall patterns become increasingly unpredictable and drought periods more intense, as a result of climate change. There is also some potential for this threat to result in indirect impacts on BD, and to have implications beyond the farm, if the resulting failure of existing livelihood systems leads farmers to increase productive and/or extractive pressure on natural ecosystems to compensate. This type of agricultural practice is particularly evident in the case of the *altiplano* area of Massif la Selle, in the southeastern target area, where large areas are dedicated to vegetable production with virtually no soil cover or tree components in the cropping system.

Figure 2. Schematic depiction of impact flows affecting biodiversity and climate change resilience



98. **The continued elimination of trees from steep slopes** has resulted in the loss of the physical reinforcement provided to the soil by tree root systems, and a corresponding reduction in the resilience of the slopes to the risk of slumping and landslides during periods of high rainfall, when the soil becomes saturated and lubricated. The more gradual process of gully formation is also facilitated by the absence of tree roots capable of binding the soil and trapping sediment. Lack of tree cover also reduces rates of infiltration of rainfall and runoff water, resulting in reduced recharge of soil water and aquifers, and consequently increased exposure to drought, and increases the “flashiness” of watercourses in the event of rainfall events.

99. Deforestation as such can largely be considered a historical phenomenon in Haiti, where only around 3% forest cover remains; the current threat that perpetuates this problem is the continued use of these lands for agriculture and grazing, which prevents the tree component from re-establishing itself. The resulting slumping and landslides generate impacts on farm in the form of the loss of scarce agricultural land; given the small average farm size in the country the implications of this for the livelihoods of individual farmers can be severe. They also generate downstream impacts in the form of flash floods, which can result in severe loss of life, infrastructure and agricultural land; and the deposition of debris in watercourses, raising their profile and exposing the surrounding areas to increased risk of flooding during future rain events. Again, this is a “business as usual” threat given Haiti’s innate exposure to tropical storms and hurricanes, which is a function of its geographical location; it is however likely to assume increased significance in the future as storms become more frequent and/or intense as a result of climate change. In addition to its implications for CCR, this threat may have implications for coastal and marine biodiversity as it generates pulses of sediment inputs that may have damaging effects on coastal and marine ecosystems such as coral reefs, which are vulnerable to “choking” by sediment.

100. The **cultivation of sloping lands without adequate soil conservation measures** results in high levels of soil erosion during rainfall periods. This has implications for agricultural production once the productive A horizon has been completely eliminated, but may therefore not necessarily be perceived by farmers as a problem, relative to more immediate considerations such as seasonal soil moisture, until this occurs. Its on-farm significance is therefore also dependent on the nature and depth of the soils in question. Inadequate soil conservation has off-farm impacts in the form of increased sediment loads in watercourses draining the area in question: as in the case of slumping and landslides, this may result in changes in river bed profiles in the areas downstream where the sediment is deposited, increasing the risk of flooding during periods of high river flow; it also results in increased sediment input into coastal and marine ecosystems, with potential negative implications for biodiversity.

101. The prevailing discourse among both policy makers and local stakeholders puts most of the blame for reef decline on **sedimentation** derived from poor watershed management, and an overflight of the north coast during the PPG phase confirmed the existence of sediment plumes reaching in some cases several kilometres out to sea. The deposition of sediment on corals at rates that exceed their capacity to clean their surfaces, due to discharge from rivers or resuspension in the water column by waves, affects them negatively by reducing photosynthesis and preventing larval settlement and attachment, and also causes bacterial infections eventually leading to the coral’s death.

102. Most corals can in fact survive moderate levels of chronic sedimentation, however, and recent Reef Check surveys suggest that only about 10% of Haiti’s coast is badly affected by sedimentation. It is acute exposure, due for example to storm events that wash large amounts of sediment into the sea, that can quickly kill corals, especially if it is buried in sediment. Of the three Project Areas, chronic sedimentation appears to be the worst in the SE due to erosion and resuspension of fine silt from coastal limestone.

During storms, however, acute sedimentation may be serious in Baraderes due to the large watersheds and red clay soil there.

103. Again, soil erosion and its consequences are “business as usual” phenomena due to the high levels of erosive rainfall under normal conditions, and the generalized scarcity of soil conservation measures; but they are likely to assume increased significance under conditions of climate change due to the increased frequency and/or intensity of storms with high erosive power.

104. Another terrestrial threat affecting coastal and marine ecosystems is pollution. **Eutrophication as a result of fertilizer runoff** is reported to have affected fish populations in some areas and led to the smothering coral reefs by algae. Other forms of land-based pollutants which affect coastal and marine include **plastic wastes** (98% of debris found along coastal zones is composed of plastics, mostly beverage containers); raw sewage, other domestic liquid wastes (“grey water”), industrial effluents (including oils from power station and chemicals from tanneries), due to inadequate or non-existent collection and treatment facilities; and vehicular oil dumped into gullies and watersheds.

105. The nature, magnitude and implications of the threats described above, related to poor watershed management, vary widely between and within the target areas. Field visits carried out during the PPG phase revealed that in many areas, there is a middle-altitude belt with a high density of trees, in which the threats associated with inadequate soil cover, soil erosion control or binding tree root systems appear to have limited significance; this situation contrasts in some areas (for example the hills above Pestel in the southwest target area) with a higher altitude belt dominated by scrubby vegetation, managed under a cyclical fallow-based system in which there appears to be significant binding root mass despite the low above-ground profile of the vegetation; and this in turn with the *altiplano* around Seguin in the southeast target area, where there is little evidence of soil conservation, water conservation or on-farm trees.

Poor management of coastal and marine areas

106. A summary of the results of 320 Reef Check surveys in Haiti from 2011 through December 2013 show that the mean living coral cover (HC) on Haiti’s coral reefs was 15% as measured by standard line intercept surveys on reefs, and <10% when measured by wide area surveys using the manta tow that included back reef and non-reef areas such as lagoons. This is about half the mean for the Caribbean (25%) using the same method. The cover of macroalgae on reefs in Haiti is 30%, a very high level more than double the Caribbean mean (13%). The cover of sponges in Haiti is about 10%, also a high value above the Caribbean mean of 7%. These results confirm that the reefs of Haiti have been destabilized due to nutrient inputs that fertilize algal growth and overfishing that has reduced the population of herbivorous fish, as well as the die off of the herbivorous *Diadema* sea urchin some 30 years ago.

107. The Reef Check survey results confirm that very low numbers of all indicator fish and extremely small sizes were recorded during surveys in all areas of the country. For analysis, individual surveys from each area of the country were grouped together into 15 areas. Out of the 15 areas (groups of sites), less than 1 fish was counted per 100 m² of reef at seven sites. There were almost no grouper, and the Nassau grouper was only seen in Ft Liberte. The Nassau Grouper is on the US NOAA “Watch” Species List.

108. Despite the focus of prevailing political discourses on upstream-downstream impacts (notably sedimentation), many of the most significant impacts affecting coastal and marine ecosystems in the target areas are of more local origin. The prime cause of the dire current situation of fish stocks is **overfishing**. This also has indirect impacts on the health of coral reefs and associated ecosystems: typically, reef fishermen initially target desirable predators such as grouper (Serranidae) and snapper (Lutjanidae), but when these are fished out, they turn to herbivores such as parrotfish (Scaridae) and doctorfish (Acanthuridae): the resulting decline in populations of these herbivorous fish allows the uncontrolled

growth of macroalgae, which can overgrow them in a matter of days to weeks, block out light, exude toxic compounds and ultimately kill them off.

109. Haiti produces more than 6,000 tons of fish annually, and the total number of fishers in the country is estimated at around 30,000, using 5,000-6,000 small artisanal vessels, mostly propelled by sails or oars. Fishing is largely carried out for subsistence and local sale and is mostly limited to near-shore areas, given that few fishers have access to motors or fishing gear that would enable them to exploit deeper water areas offshore. The fisheries resources available to these fishers are also limited by the narrowness of the continental shelf, which often extends less than half a mile from the coast. According to a study in the Artibonite area⁶, artisanal fishing has developed progressively since 1950, but the growth in the number of fishermen has intensified since the 1980s due to the combined effect of high population growth and the migration of farmers from degraded agricultural areas to the coast. Fisheries have also changed markedly over the last 30 years from being of a subsistence nature to being market-oriented. In recent years, a growing number of fishermen have been obliged to explore fishing areas outside their village because of overfishing: this migration along the coast has resulted in competition between fishermen to access the coastal demersal resources which are rarer and are smaller in size.

110. Inspection of fish for sale in local markets is a good proxy for which fish are being targeted. The fresh fish observed during PPG studies in the market at Pestel (Complex 2) were primarily herbivores of less than 7cm length sold in buckets. There were about 10 pieces of dried trigger fish (40cm), jacks (30cm) and one barracuda (60cm). There were many boxes of salted fish especially moray eels (30 to 40cm). Morays live in holes on the reef, so are an easy target of spear fishermen and get caught in traps. This explains why there are almost no morays on the reefs. These morays have been fished out of shallow (<12 m) reefs and are being caught in traps below the survey depth limit. Overall, the market in Pestel clearly confirms the status of the reef fishery: the fish on display were the smallest size and number observed in a town that size in Haiti and the world.

111. While overfishing is a global problem, these fish abundance results are the lowest recorded by Reef Check in the Caribbean. Based on size, all RC indicator fish counted were juveniles less than 20 cm fork length except for moray eels. Some large schools of mature Haemulids (grunts) and Sparids were observed below 20 m depth at St Marc Point. Four barracuda and one eagle ray were observed during manta tows of the entire country.

112. Butterflyfish have been collected for the aquarium trade for many years in Haiti and are also eaten when caught in gills nets and traps. The snapper, grouper, Haemulids, and moray eel are all predators, while parrotfish are a key herbivore. On a healthy Caribbean reef, a Reef Check survey should count about 10 to 20 mature grouper, dozens of parrotfish, snapper, grunts, butterflyfish, and a few moray eels. No mature pelagic fish such as jacks, dorado or tuna were observed on any survey.

113. The results from the surveys indicate that indicator invertebrates are also extremely low in number – near zero for most. These results mirror those for fish and indicate overfishing of most of these organisms. The banded coral shrimp is collected for the aquarium trade while the pencil urchin, triton and flamingo tongue are collected and sold for the curio trade. The collector urchin and spiny lobster are collected for food. The reefs of Haiti may therefore be considered among the most overfished and destabilized in the world.

114. The uncontrolled growth of macroalgae on reefs, leading to coral mortality, is further promoted by the discharge of nutrient-laden sediment from rivers, with clay particles containing in particular nitrogen and phosphorus: this contrasts with the characteristically low nutrient levels of tropical waters under normal conditions, except near the shore or in areas of upwelling.

115. Fisheries governance is virtually inexistent, leading to a ‘tragedy of the commons’ situation that motivates overexploitation of the resources and **the use of damaging fishing practices**, such as failure to respect closed seasons for lobsters, the use of purse seines, compressor fishing, night fishing on drums, and the use of small net gauges which result in the capture of immature individuals that have not reached reproductive age. Thousands of abandoned fishing traps and nets at the bottom of the sea continue fishing and consequently killing important amounts of fish. Despite increasing fishing effort and diversifying their fishing methods, fishers report that catches remain largely stagnant. 90% of fishermen surveyed are unaware of the existence of fisheries legislation.

116. This situation has led to the loss of large, more mature fish which have slower growth rates and are easier to catch; a reduction in the average size of the fish caught (due in part to the elimination of predators), with a corresponding reduction in the unit value of the catch; and changes in species composition and reduction of overall biodiversity, with increases in the relative proportions of elements such as squid and jellyfish. Healthy coral reefs can provide up to 35 metric tons of fish per square kilometre, whereas overfished reefs such as those in Haiti provide only one tenth this amount. A new development in the over exploitation of the mangroves is the netting and sieving of mangrove pools for large zooplankton and brine shrimp. These creatures form the base of the fisheries food chain, and with their decline fisheries resources can be expected to plummet. Despite these problems, fishing remains a relatively lucrative alternative, when compared with meager alternatives that are available. In the Artibonite area, the average income of fishers of HTG34,026 (US\$800) per year is well above the average annual income of HTG24,784 (US\$582) and especially that of the northwest region, which is HTG10,693 (US\$251).

117. In addition to the overexploitation of their constituent fauna, coastal ecosystems have been directly targeted by damaging extractive practices, as a result of demographic pressures, the nature of demand, and the existence of limited alternatives for livelihood support. Mangrove forests, that fringe coastlines in areas with lower wave energy and higher levels of sediment input, have been severely impacted by the **extraction of timber** for construction, charcoal production (charcoal is the main domestic energy source in the country) and bark for tanning. Draining and filling mangroves for development is taking place for the purpose of housing construction at Cap Haitien, Archain, and other coastal urban areas. Between 1956 and 1977 it is estimated that 7 percent of the mangroves disappeared. In 1987 there were approximately 22,360 hectares of mangroves in the coastal zone of Haiti: currently, that figure has dropped to 17,337 hectares, a decline of 24%.

118. The loss of mangroves, which are already under pressure from climate change-related sea level rise (see paragraph 124), results in the loss of important habitat for coastal and marine fauna: mangroves are vital as spawning and grow-on areas for many aquatic species that inhabit reef and pelagic environments during other parts of their life cycles, so their loss has ecological and productive implications far beyond their own boundaries. Furthermore, it undermines the important buffering effect that mangroves play against wave impact, thereby leaving coasts and low-lying coastal communities increasingly exposed to the impacts of sea level rise and CC-related storm events.

119. The **extraction of sand** from beaches for building is changing the morphology and the landscape, disturbing the hydrology, increasing erosion and disturbing the whole ecosystem. **Coral mining** for lime production (building material) and potentially resulting in the reduction of areas of reefs is also a threat to be considered in the context of the ecosystem regeneration.

120. The north coast, including the Three Bays area, is a particularly clear example of the tensions between economic development and environmental sustainability. This area is proposed by the Government as one of the major geographic poles of the country’s future development: of particular

significance for the status of natural resources in the coastal and marine zone there is the construction of a major industrial park just inland from Caracol Bay, which is expected to generate up to 40,000 direct jobs and benefit 500,000 other families through economic multiplier effects. The Initial Environmental Assessment of the industrial park⁷, which will straddle the Trou du Nord river which runs into Caracol Bay, suggests that **emissions of liquid wastes from the industries there will affect the water quality and therefore the health of the aquatic ecosystems** in the bay, even if treatment measures are implemented. The park is in addition likely to lead indirectly to a wide range of other impacts, due principally to the major influx of population that it is likely to stimulate: this is likely to be out of proportion to the actual labour force required by the park, due to speculative migration by others and the generation of diverse service industries of a range of types and levels of formality. These impacts are likely to include **increased rates of deforestation of mangroves** for the establishment of settlements and to supply the growing population of the area with building poles, firewood and charcoal; **increased pressures on fisheries resources** to satisfy increased demand for food; **increased levels of extraction of beach sand and coral** for building; and **increased levels of pollution of coastal and marine ecosystems** by solid and liquid wastes (both **domestic sewage from settlements and industrial wastes from service industries** which are likely to spring up around the park. These impacts are likely to be larger in magnitude than those of the park itself, and much harder to mitigate or control due to their dispersed nature or non-point nature and the existence of limited capacities for enforcement. In addition, the park and its associated settlements will place major pressures on the Trou du Nord aquifer, and there is a risk that **over-extraction of water may lead to saline intrusion**.

121. During the late 1970s and early 1980s, two different **diseases** spread throughout the Caribbean and killed off the long-spined black sea urchin *Diadema* and two species of coral, the staghorn (*Acropora cervicornis*) and elkhorn (*Acropora palmata*). Unfortunately, these two species of coral were so abundant that they literally formed two wide zones on the reef, the *A. palmata* zone in shallow water next to the shore and the *A. cervicornis* zone at the base of the reef slope in about 8 to 10m of depth. So once these two corals died out, the reefs were missing two large zones accounting for perhaps 30 to 40% of every reef. The loss of the black sea urchin further exacerbated the overfishing problem with respect to herbivores, and resulted in more macroalgae taking over the reefs. These diseases did not affect seagrass beds or mangrove forests. At this time, it appears that the diseases have stopped killing the corals and sea urchins, and both are making a slow come back. The fact that there are significant numbers of colonies of staghorn and elkhorn corals in Haiti is extremely important because the reefs can serve as a source of larvae for both corals and urchins in downstream areas. The faster the recovery of the reefs in Haiti, the faster the recovery will be in Florida

122. The threats affecting coastal and marine areas in Haiti have a range of implications:

- They undermine the conservation status of globally important BD at both species and ecosystem level: despite the high levels of environmental degradation that coastal and marine ecosystems have suffered to date, they still contain remarkable levels of globally important diversity (including many endemic and migratory species); they also contribute significantly to regional-level processes of biological connectivity, and in general are still in a condition where ecosystem health and biodiversity is capable of undergoing significant recovery if the current pressures are removed;
- They reduce the resilience of (particularly coastal) populations to the effects of climate change, by undermining the EBA role of ecosystems. Coral reefs, mangroves and seagrass beds all have the ability to buffer wave impacts, which are otherwise likely to become more damaging under conditions of CC-related sea level rise and increases in the frequency and severity of storms.

- They undermine the livelihoods of local people, particularly the rural poor, which depend on the coastal/marine resource base. This in turn may stimulate further increases in pressures on the available natural resources, resulting in a downward spiral in which their BD value, their EBA role and their ability to sustain livelihoods are further undermined.

Climate change/biodiversity/vulnerability interactions

123. A number of the ecosystems described above play vital roles in helping vulnerable human populations to adapt to the effects of climate change (“Ecosystem-Based Adaptation” or EBA).

- Mangroves and coral reefs provide physical protection against the impacts of waves, which are likely to become more damaging as the frequency and/or intensity of storm events increase under conditions of climate change.
- Hillside forests help to protect against disastrous slumping during extreme storm events, due to the physical reinforcement provided by their root systems.
- Terrestrial vegetation helps to promote rainfall infiltration, thereby conserving reducing damaging erosive runoff during CC-related storm events, conserving vital soil humidity during CC-related drought periods, and reducing the variability in river flows (with more reliable flows during drought events and less risk of disastrous high flows during storm events).

124. At the same time, these and other ecosystems are likely themselves to be affected by climate change, for example as follows:

- The seaward edges of mangrove forests are likely to experience increased water depth due to global sea level rise (SLR) (estimated in neighbouring Cuba to reach between 16 and 62cm by the year 2100), which once they exceed their tolerance limits will result in their recession. This could be accompanied by a similar, compensating movement of their landward edges as moisture and salinity gradients move inland there, but this will only happen if there is land available there, with suitable conditions, into which they are able to migrate. If there is not, there will be a net reduction in the area of mangroves.
- Coral reefs are also likely to suffer mortality due to sea level rise, as increased water depth reduces light penetration and therefore photosynthetic rates in their associated algae. Coral reefs are also likely to suffer increasingly from “bleaching” events due to increased water temperatures associated with climate change: this process occurs due to symbiotic microscopic algae leaving the coral colony, leading eventually to its death. While it appears that the microscopic algae are adapting to warmed temperatures, this will only happen up to a limit, estimated to be around 35°C.
- Beaches and cliffs are likely to suffer from increased physical erosion due to sea level rise and increasingly frequent and/or severe storm events.

125. In addition to undermining their role as agents for EBA, CC-related impacts on these ecosystems will result in the undermining of the livelihoods of the thousands of poor people who depend on them for subsistence and income. Reductions in the areas of mangroves due to the recession of their seaward edges under conditions of SLR will affect fish populations, for example, which depend on mangroves for reproduction, spawning and/or grow-on; as will the CC-related decline of coral reefs, which play vital roles in the life-cycles and feeding patterns of fish and associated aquatic fauna. In addition to their direct impacts, such events have the effect of stimulating migration from the affected areas, resulting in increased pressures on natural resources in the receiving areas.

126. As will be discussed in the section on Threats below, these pressures related to global climate change are further compounded by human activities of local origin.

Baseline analysis

127. There is a solid and diverse baseline of investments in relation to natural resource management, conservation and CC resilience in Haiti, however this lacks the integrated vision proposed in the present project, which is necessary to take into account the landscape-wide spatial interrelations between these considerations. These include national and local scale programmes and projects supported by resources of the Government of Haiti as well as international agencies, as well as initiatives being executed within the framework of the UNFCCC process by UN agencies, multilateral financial institutions and bilateral development assistance agencies.

128. Most of these initiatives, whether or not directly focused on the promotion of resilience and adaptation, involve the strengthening of institutional capacities, covering aspects such as institutional reform, policy and regulations, food security, social protection and disaster risk management, including flood control but also ground-level tasks such as reforestation, irrigation and drought resistant crops.

Government initiatives funded by central budget

129. Efforts promoted by governmental agencies that are exclusively funded from the Public Investment Budget tend to address the following issues, even if they are not conceptually designed under a specific framework of adaptation and resilience: (i) ensuring primary needs and provide a social safety net for the most vulnerable: women, elderly, children and disabled people, and combatting social exclusion; (ii) improving food security; (iii) addressing the implications of exposure and vulnerability to extreme weather events.

130. The ***Ede Pèp (Help the Haitian People) Programme***, which falls under the responsibility of the institutional cluster formed by FAES/Ministry of Social Affairs and the Bureaus of the Ministers in charge of Haitian Peasantry, Human Rights and The Fight Against Extreme Poverty, is the Haitian Government's flagship social assistance programme, initiated in 2012 within a broad framework of fighting poverty and facilitating access to social protection and social safety nets, in order to achieve social inclusion. Responding to the specific objective to help low-income and most vulnerable families and support their economic activities in least-favoured areas of the country, the programme encompasses several projects based mainly on two main areas of focus:

- (i) Cash transfer schemes, including “*Ti Manman Chérie*” (monthly transfers to mothers as contributions to ensure education costs of their children), “*Kore Moun Andicape*” (transfers every two months to people with disabilities and no pension entitlements who need financial assistance for their survival) and “*Kore Etidyan*” (monthly lump cash to students of Public University and in some cases students in Private Universities regularly admitted in the higher level);
- (ii) Direct food contributions, including “*Panye Solidarité*” (food hamper kits to mothers in need), “*Restoran Kominotè*” (community restaurants established in disadvantaged areas serving a daily hot meal to people for 10 gourdes), “*Kore Peyizan*” (access to agricultural inputs and fishery products to small farmers and fishermen), and “*Kredi Fanm Lakay*” (small credits targeting women in rural areas to boost economic activities which would provide income and self-sufficiency).

131. The 2013-2014 mid-term report to the Haitian Congress stated that a total of 311,440,246 Haitian gourdes (around US\$6.92 million) were spent in a six-month period by the Government of Haiti to support various projects that fall under the *Ede Pèp* programme.

Watershed Management, Urban Flood Control and Reforestation projects of the Ministry of Environment

132. The Ministry of Environment is responsible for at least 6 adaptation/resilience-related projects, funded under the national budget and implemented in the districts of Peredo/Marigot and Ouanaminthe (in Complexes 3 and 1 of the present project, respectively), as well as Port-au-Prince, Thomazeau and Petit Goave (in the West department), Les Cayes town (South department) and Petite Rivière de l'Artibonite (Artibonite department). These projects, that have mobilized 376,117,464 gourdes between 2012 and 2014 (US\$8.36 million), tend to address watershed management, urban flood control and reforestation issues, and rising water levels. Increasing urban resilience through “hard” adaptation techniques, such as flood control measures, is a particular concern of the Ministry of Environment. The Peredo/Marigot and Ouanaminthe protection projects cover concrete actions of cleaning the Peredo and Massacre rivers and flood channels, and the systematic use stone reinforcement of river banks as a tool for stabilization.

133. The most important initiative, “*Sove Lavi nan Mòn Lopital*” (Saving Lives in L'Hopital Mountain Range), implemented in the mountains surrounding the communes of Pétion-Ville, Port-au-Prince and Carrefour communes (West department), also reflects this particular attention paid to urban resilience by the Ministry of Environment. The main objective of this initiative is to reduce the vulnerability of people (around 54,600 families with 246,000 members) in the L'Hopital Range from the risk of urban floods by: (i) building civil engineering works in active ravines to limit storm flow conditions; (ii) creating forest zones in the l'Hôpital Mountain range to facilitate water penetration in the soils; and (iii) acting on/preventing uncontrolled and illegal constructions.

134. In relation to reforestation, the published governmental priorities for the environment by the Ministry of Environment¹⁰ call for actions in the following priority areas (mainly watersheds) that are essential for multiple ecosystem services, including the supply of fresh water for people and downstream habitats and landscapes, and are also fundamental to the food security of communities with high levels of vulnerability to changing climates. The Ministry uses national reforestation campaigns as approach to boost reforestation employing aerial seedings methods and classic tree reproduction techniques in nurseries. These prioritised areas coincide significantly with the target Complexes of the project proposed here:

- The humid uplands in the departments of the North-East (**project Complex 1**), North and the region of Saint-Louis du Nord;
- The North-West and the Trois Rivières region comprising the vicinities of Port-de Paix, Môle St-Nicolas, Gros-Morne, Gonaïves and Marmelade uplands;
- The watersheds feeding the Artibonite river including the Département du Centre, the regions of la Vallière, the community of Mombin Crochu, and the district of Marchand-Dessalines;
- The watersheds around Port-au-Prince and the lower parts of the Artibonite river including Saint-Marc district;
- The protected areas Forêt des Pins/Massif de la Selle, the arrondissement of Belle-Anse in the South-East (**project Complex 3**) and the communes of Fond Parisien and Ganthier in the West Department;
- The National Park La Visite/Massif de la Selle focussing on the National Park La Visite and the districts of Jacmel and Léogane (**project Complex 3**);
- The National Park Macaya/Massif de la Hotte and the watersheds for les Cayes including areas of the National Park Macaya and the districts of Jérémie, Anse d'Hainault, Corail, Pestel, Cayes, Port-Salut, Coteaux and Chardonnières (**project Complex 2**);
- The mountains of Bonnet-Carré ridge affecting the district of Saint-Louis du Sud and the commune of Baradères (**project Complex 2**);
- The sub-humid region of Nippes including the Department of Nippes (Baradères, Boucan Carré, Petite Rivière des Nippes) (**project Complex 2**);

¹⁰ MDE 2011, Feuille de route de l'action gouvernementale dans le domaine de l'environnement

- The major satellite islands: La Gonave, l'île de la Tortue and l'île à Vache.

135. The Ministry of Environment is also involved, through its national budget with some slight technical support from the International Atomic Energy Agency (IAEA), in a binational research initiative with Dominican Republic (DR) to monitor rising water levels in the Region of Lakes and flooding of low-lying areas in Thomazeau district (West Department) with the assumption that climate change could originate this rising water level observed. The Azuei is the main lake of the country with an area of 113 km², a maximum depth of 24m. It constitutes in fact a transboundary lake with the Dominican Republic (Azuei Lake in Haiti and Enriquillo Lake in the counterpart of Dominican Republic). Implemented by the National Observatory on Environment and Vulnerability (ONEV), the objective of this initiative is to improve capacity for sustainable water management in the transboundary region of the Lakes with the main outcome consisting of improved knowledge of temporal and spatial variations in the water volume in the transboundary lakes-aquifer system (Azuei and Enriquillo Lakes), with emphasis in water balance and contributions from different geological settings. Some of the main activities envisaged include the following: (i) installation of climatic, rainfall stations and gauging points; (ii) identification of recharge zones; (iii) establishment of perimeter protection; (iv) mapping (land use, perimeter protection and water catchment protection areas); (v) soils maps and slope coverage areas; (vi) establishment of the flow of groundwater and surface water etc.

2012 Post Isaac and Sandy Hurricanes related Adaptation/Resilience Initiatives from the Ministry of Agriculture, Natural Resources and Rural Development (MARNDR).

136. Severely hit by hurricanes Isaac and Sandy in 2012 (with impacts amounting to 7% of GDP, and losses in the agricultural sector estimated at US\$254 million¹¹), the agricultural sector was identified as the top recovery priority by the current Martelly/Lamothe government, and the MARNDR was designated as the main governmental agency to implement recovery activities. By mid- 2014, MARNR had implemented at least 14 projects that could be considered as related-adaptation/resilience activities, covering water resources and flood control, food security, livelihoods security and reforestation¹². Of these projects, most are of direct relevance to issues of long-term resilience.

Awareness raising actions and preparation of Programmatic Framework for Resilience by the Ministry of Interior

137. On an annual basis, the Ministry of Interior, as the institution leading disaster reduction activities through the National System of Risk and Disaster Management and the Direction of Civil Protection, promotes awareness raising actions before and during the hurricane season (June to November).as part of its mission to formulate emergency preparedness, response and recovery plans.

138. In consonance with the "Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters", the Ministry has supported the preparation of Resilience Programmatic Frameworks (RPF) for three Departments, with 3 communes per department selected for pilot actions according to criteria including impacts, isolation and economic opportunities. All three of these areas coincide with the target complexes of the present project:

- North Department, with a five year projected budget of US\$35 million, covering Cap-Haitien, Borgne and Limonade communes (Complex 1);
- North-East Department, with a five year projected budget of US\$35 million, covering Fort-Liberté, Ouanaminthe and Vallières communes (Complex 1);

¹¹ IFAD 2013

¹² Bilan de l'action gouvernementale, Gouvernement de la République d'Haiti, June 2014

- Grande Anse Department, with a five year projected budget of US\$40 million, covering Jérémie, Dame-Marie and Pestel communes (Complex 2).

139. These RPFs, designed to build resilience to hazards, have the following specific objectives: (i) to establish coordination mechanisms for planning, implementation, management and evaluation; (ii) to strengthen knowledge-base of communities related to risks and vulnerability of the Department; (iii) to enhance the understanding and the commitment of the the population and key stakeholders; (iv) to strengthen resilience of community livelihoods; (v) to strengthen the infrastructure of the Department through watershed management actions; and (vi) to reduce the vulnerability of communities by putting in place resilient service bases.

140. The following activities proposed in the RPFs are of specific relevance to the present project: (i) the integration of resilience into functions of departmental inter-agencies coordination structures (“Tables de Concertation” or Consultative Tables, Departmental Committee for Disaster and Risk Management etc); (ii) establishment of a baseline to facilitate the definition of resilience indicators to hazards as well a follow-up and communication strategy; (iii) mapping of risks, identifying challenges and evaluation of vulnerability; (iv) incorporating Disaster Risk Management and Resilience approach into school curriculum (v) identifying and mapping of Protected Areas and areas to be declared PAs; (vi) evaluation of capacity (knowledge of risks); (vii) watershed management (reforestation, agroforestry, soils conservation, river stabilization through the use of the enrockment of banks and retention ponds etc); (viii) identification, testing, validation and promoting best agricultural and environmental practices; (ix) early warning systems and evacuation plans.

Initiatives of cooperation agencies and donors, and associated baseline projects

141. Resilience and adaptation are becoming more widely supported among donors in Haiti. Increased support for resilience and adaptation is coming from traditional development donors who see the need to protect the benefits of their program and projects against climate change, as well as some donors that see climate change resilience and adaptation as a goal in itself or agencies within the United Nations System in their mission to assist countries, with support of the Global Environment Facility, to implement their commitments under the three Rio Conventions (UNFCCC, UNCCD, CBD) . Cooperation agencies are therefore scaling up their resilience and adaptation commitments and the number of initiatives, programmes and projects dedicated to resilience and adaptation is growing. The initiatives presented below fall into three overall categories:

- A. *Initiatives with direct linkages to CC Adapation/Resilience.* These deliberately target CC resilience or adaptation and vulnerability to disasters: their titles, objectives, activities and/or approaches make specific references to Ecosystem-Based Management, including protected areas, the ridge to reef approach, integrated watershed and coastal area management, integrated coastal and marine management and other related approaches;
- B. *Initiatives indirectly related to Adaptation/Resilience:* these are actions with no specific references to CC resilience/adaptation, but which lay solid foundations for the development of CC resilience processes. These include initiatives addressing economic issues affecting agriculture, food production and security, social protection and social safety nets, agricultural value chains, and technology transfer in the field of agriculture, that are especially relevant in the context of CC resilience;
- C. *Initiatives with potential cross-cutting relevance to CC,* dealing with aspects addressing direct or undirect capacity-building or governance dimensions of resilience/adaptation to climate change.

A. INITIATIVES WITH DIRECT LINKAGES TO CC ADAPTATION/RESILIENCE

The Technical Group of Political Champions for Resilience in Haiti (TG-PCR/Haiti)

142. The TG-PCR/Haiti is a recently established high level multi-agency platform, that is intended to play an ambassadorial and advocacy role in favour of causes and issues that relate to resilience and its relation to the development process across the country. It is composed of a mix of humanitarian community and cooperation agencies within the United Nations System and representatives of donors operating in Haiti, including entities such as UNDP, OCHA, USAID, OFDA, OXFAM, WFP, ECHO/EU, ACTED, IFRC (International Federation of Red Cross) and DFID (Department for International Development of UK).

143. The TG-PCR/Haiti has been very active in assisting the Ministry of Interior to prepare Departmental Resilience Programmatic Frameworks, and to analyze possibilities for alignment with ongoing resilience initiatives provided for in existing RPFs or to be supported by different donors and cooperation agencies. In accordance with the RFP provisions, the TG-PCR/Haiti also emphasizes the need to establish, at the regional level, departmental coordination mechanisms for resilience.

144. An important proposal that is currently under consideration is that the TG-PCR/Haiti should advocate for the creation of a national multi-donor fund that would allow the financing of activities described in the RPFs (financial resources for the RPFs do not exist yet): to date, however, only DFID has concretely demonstrated interest for this idea. It is expected that a think tank of key members of TG-PCR/Haiti should be put in place to explore possibilities to move towards to such initiative.

UNDP actions in relation to Climate Change Resilience

145. The current UNDP portfolio, drawn from the UNDP Country Programme, touches a wide range of critical resilient-climate change, adaptation and development issues in Haiti. UNDP is the pioneer UN system agency, and the first among developing agencies operating in the country, to have formally put adaptation to climate change at the heart of development agenda of Haiti with the support of GEF/LDCF and others.

1) Building Adaptive Capacity to address Climate Change Threats for Sustainable Development Strategies in Coastal Communities of Haiti (MDE/UNDP/LDCF)

146. This project was launched in 2011 and will last to December 2015. It aims to (i) respond and plan capacities development in areas related to climate change by ensuring that national and municipal development plans and sectoral policies and associated budgets incorporate the needs of adaptation; (ii) provide expertise and environmental support that communities must have to effectively adapt to adverse weather conditions, and (iii) share experiences in adaptation the local, national and international level. To achieve this, the following outcomes are will be delivered: (i) Institutional capacity to plan for and respond to climate induced impacts in coastal areas improved; (ii) Climate risks management is fully mainstreamed into humanitarian and development investment frameworks; (iii) Resilience of low-elevation coastal zones to emerging climate change threats enhanced; (iv) Models of best practices and lessons learned from the project activities captured and institutionalized.

2) Establishing a financially Sustainable National Protected Areas System (NPAS) (MDE/UNDP/GEF)

147. This project was designed, in particular, to promote increased investment in PAs by the Haitian Government, in recognition of their importance for national development and vulnerability reduction and increase the efficiency and effectiveness of the use of the funds available; and diversifying the sources of income available to PAs. It aims to achieve a significant qualitative change to the functionality and sustainability of the PA system, allowing the Haiti's highly important and threatened biodiversity to be subject to effective conservation for the first time in the country's recent history, and creating favourable

conditions for future expansion of the PA system to cover currently under-represented habitats. Therefore, the focus is on laying the institutional bases for achieving financial sustainability in the NPAS, by stimulating increased investment in PA management, increasing the efficiency of the use of the resources available, and reducing the cost burden of PA management on the Government. To achieve these, the following three outcomes were prioritized: (i) improved PA governance system, backed by policies, regulations and competent institutions, enables more cost efficient use of funds available for PA management; (ii) Promotion of partnerships to increase the social, ecological and financial sustainability of PAs; (iii) Diversification of PA income sources in order to increase income and reduce vulnerability to funding fluctuations.

3) Global Environmental Facility/Small Grants Programme (GEF/SGP)

148. The SGP in Haiti has been administered and implemented by UNDP since 2006. It provides grants to NGOs and CBOs (Community-Based Organisations) in support of community-based initiatives that could contribute to the GEF focal areas on biological diversity, climate change, land degradation and international waters. The SGP is currently implementing 18 community projects in 5 departments: North-East, North, Artibonite, Plateau Central and South. It operates, with the support of AusAid, the “Community-Based Adaptation to Climate Change Programme” with a view to improve adaptation capacity to climate change and climate variability through community measures capable of increasing resilience of livelihoods systems and ecosystems. The SGP has steadily raised its profile over the last few years at local, regional and central government levels, with local, regional and national government officials starting to acknowledging its important contributions in strengthening community initiatives.

4) National Programme of Support to the Disaster Risk Management (UNDP)

149. This programme is assisting the Haitian government to implement its National Plan for Disaster Risk Management. Among other activities, it is supporting the installation and acquisition of hydro-meteorological monitoring equipment which will provide a stronger basis for climate early warnings in the future, developing a disaster risk reduction roadmap and tools in terms of preparedness and response, and reviewing the construction codes that did not take earthquake risk adequately into account.

Actions supported by the Norwegian Government (NORAD)

150. The Norwegian cooperation (NORAD) channels funding to UNDP to carry out, in collaboration with UNEP, the project “**Reducing the Vulnerability of the population and infrastructure in the Southern Department Phase II**” that targets territorial rebuilding in the Southern Peninsula¹³ with a view to strengthen the capacity of local and national governments to mitigate and respond to disasters, plan and manage the return and resettlement of affected population, including debris management, and to develop territorial plans based on population analysis. The intervention areas of the project are:

- The Hydrographic Unit (HU) of Les Cayes, covering the municipalities of Arniquet, Chantal, Torbeck, Les Cayes and Camp Perrin;
- The Hydrographic Unit of Aquin-St. Louis, covering the municipalities of Aquin and St. Louis du Sud.

151. Norwegian cooperation, in support to UNDP, UNEP and WFP, also provides funding to the “**Frontière Verte/Frontera Verde Programme Framework**”, especially through the “**Revegetation and Transboundary Natural Resources Management –Phase I and II Massacre and Pédernales Rivers Watersheds Project**” that falls into this Framework Programme and which operates in the North-East and South-East of the country along the border with the Dominican Republic. Expected tangible benefits during implementation of this project are: direct and indirect green jobs, vegetation conservation, green

¹³ The Southern department shares the Southern peninsula with the departments of Grande-Anse and Nippes (established in 1976).

incomes generated by established micro-enterprises (micro greenhouses, apiaries, energy farms, etc.), and added value to better quality social services (effect induced by improving local management coordination). Impacts expected in the middle to long term (four to ten years), are: reduction of soil erosion and sedimentation of water bodies and dams; improved quality of life of communities and poverty reduction; recovery of forest natural regeneration capacity; reversal of desertification and drought processes; and reduction of vulnerability to extreme flooding.

152. NORAD also provides additional financial resources to the existing funded MDE/IDB/GEF project “**Sustainable Land Management of the Upper Watersheds of Southwestern Haiti**” whose objective is to contain the rapid environmental degradation in the upper watershed of the Southern part of Haiti, particularly in the area of the biologically rich zone of the Macaya National park and its buffer zones, through the integration of sustainable land and forest management practices, and the prevention of deforestation, soil erosion and natural disasters. Additional NORAD funding will support two main components of the project: 1) Strengthening and restauration of ecosystems services 2) Strengthening of local and institutional governance

UNEP portfolio

153. The UNEP portfolio is embedded in the umbrella programme, the “**Côte Sud Initiative (CSI)**”, presented by UNEP as a joint effort of UN agencies (currently UNEP, UNOPS and UNDP), focused on the Southern Peninsula as a coordination mechanism to prevent duplication of work in the region.

Box 1. The Cote Sud Initiative

CSI is articulated around 5 themes (currently promoted through 6 projects):

- 1) *Mer Sud* (Sea) – UNEP: this theme targets Marine Ecosystems and Integrated Coastal Zone Management. It aims to regenerate marine ecosystems through the rational utilization of marine resources and diversification of livelihoods, in an integrated management framework for the South Department Coast;
- 2) *Terre Sud* (Land) – UNDP: this theme targets Terrestrial Ecosystems and Watershed Management. It aims to establish sustainable vegetation cover through the rational utilization of soils for agriculture and forestry and development of activities for livelihood and income generation in the South Department;
- 3) *Route Sud* (Roads) – UNOPS: this theme is dedicated to the rehabilitation and construction of primary and secondary roads, bridges and wharfs, aiming at reducing the isolation of communities, reduction of the flooding risks and facilitate the physical access to social services and economic activities in the South department;
- 4) *Energie Sud* (Energy) – UNEP: this theme aims substantively to improve energy access through, inter alia, the development of electric micro grids and production of sustainable energy for the national and department grid;
- 5) *Gouvernance Sud* (Governance) – UNDP/UNEP :this theme aims to support Inter-Ministerial coordination structures at department and municipal level for sustainable development in the South Department

154. The upcoming UNEP/LDCF/GEF project “**Ecosystem Approach to Haiti’s Cote Sud**”, whose PIF was resubmitted on November 1st, 2013 to the GEF, falls into the first CSI Theme (*Mer Sud*) aiming at increasing resilience to climate change risks and decreasing disaster risk using an ecosystem approach

targeting protected areas and fragile ecosystems in the Southwestern Peninsula of Haiti. Prioritizing specifically the ecosystem-based approach to disaster risk and vulnerability reduction (Eco-DRR), this project comprises 3 components with a total of 6 outcomes:

- 1) Component 1: Ecosystem sustainability and Resilience in the identified Protected Areas of South department in Haiti's Southwestern Peninsula with the following outcomes: 1) Establishment and effective climate resilient management of Ile-à-Vache National Park and Port Salut Protected Landscape (20,253ha); 2) Improved forest and land use climate resilient practices in five protected areas (9,910ha) resulting in Green Housing Gases (GHG) emission reduction of 408,226 CO2 tons/year with a potential benefit of 2,041,128 CO2 over 5 years.
- 2) Component 2: Disaster Risk Reduction through an Ecosystem Management Approach in the broader Southwest Peninsula Landscape (Department of Sud, Grande Anse and Nippes) whose outcomes are: 1) Increased ecosystem and livelihood resilience through an Eco-Disaster Risk Reduction approach in 2,500ha along the southern coast landscape and restoration of 400ha of mangrove will result in GHG emission reduction of 2,928 tons/year and with a potential carbon benefit of 14,640 tons CO2 over 5 years; 2) Strengthened local capacity to anticipate and rapidly respond to extreme weather events.
- 3) Component 3: Reducing Land Degradation and Climate Change Impact by introducing improvements in the vetiver Value Chain with the following outcomes: 1) Improved land use practices adopted in the vetiver value chain within the Port Salut Protected Area Landscape (7,000ha) leading to significant carbon sequestration; 2) GHG emission reduction benefits through vetiver supply chain efficiencies, new use of by-products.

155. In addition, UNEP is implementing a regional initiative, **The Regional Gateway for Technology Transfer and Climate Change Action in Latin America and the Caribbean (REGATTA)** (see box), aiming at analyzing vulnerability, impact and adaptation to Climate Change in the Caribbean. A request¹⁴ has been made to UNEP to consider Haiti as a pilot country (pilot projects could vary between US\$50,000 and \$100,000, plus co-funding) in this regional initiative, with mention that the project should be implemented in the Northern part of the Southern Peninsula particularly in the area between Anse-à-Veau and Corail communes including the Baradères-Cayemites area (in Complex 2 of the project proposed here).

European Union (EU) portfolio

156. EU direct climate-resilient actions in Haiti are determined by the five areas of the Global Climate Change Alliance and also fall into the CARIFORUM and the Intra-ACP (African, Caribbean, Pacific) Programme, funded under the 10th European Development Fund (EDF) Financial Framework, which supports its member countries, in particular the Least Developed Countries (LDCs) and the Small Island Developing State (SIDS), in their adaptation and mitigation responses. The ACP Group includes 48 countries from Sub-Saharan Africa, 16 from the Caribbean and 15 from the Pacific. Many of them are amongst the countries most vulnerable to the effects of climate change: 40 member states belong to the group of LDCs and 37 member states are classified as SIDS. Haiti is the only Caribbean SIDS that also belongs to LDCF.

1) Support for Climate Change Integration in Haiti's National Development

157. The objective of this project is to reduce Haiti's vulnerability to climate change with a specific view to strengthen the government's capacity to mainstream environmental sustainability and climate change

¹⁴ In a letter dated on October 21, 2013 signed by a Cabinet member of the Ministry of Environment and sent to the UNEP Regional Director

adaptation into Haiti's development policies, strategies, programmes and projects. Its main expected outcomes and activities are as follows:

- Outcome I: *Strengthened institutional mechanisms, capacities and means are available to Haiti's government for environmental management and consideration of climate change in the planning and implementation of reconstruction, development and energy-related activities.* The capacities of Haitian stakeholders, in particular the Ministry of Environment, will be strengthened to enable them to implement, supervise and validate strategic environmental assessments (SEAs) and environmental impact assessments (EIAs) that integrate climate change adaptation considerations – in the context of the implementation of a few such assessments with project support. Support will also be given to the monitoring of the actual implementation of the environmental and adaptation measures recommended by SEAs/EIAs; the setting up of an enabling institutional and budgetary framework for the replication of successful experiences and the dissemination of practices and techniques that promote enhanced resilience to climate change and climate risks; and the development and implementation of an advocacy, communication and awareness raising strategy and plan.
- Outcome II: *Practices and techniques with a low environmental impact, enabling enhanced resilience of the population to climate risks and climate change, are tested and demonstrated in the field and evaluated with a view to their dissemination and adoption on a larger scale.* Innovative adaptation and vulnerability reduction actions, to be selected on the basis of a call for proposals, will be developed and implemented in three types of climate-vulnerable zones (urban, rural and coastal areas). Indicatively and subject to confirmation, they could bear on improvements in the resilience of housing to climate risks, the substitution of charcoal with other sources of energy, the sustainable management of woodfuels, the development of environment-friendly, climate-resilient farming practices, the protection and/or rehabilitation of important coastal ecosystems, resettlement in areas that are less vulnerable to sea level rise, etc. The experience from these projects will be consolidated with a view to sharing results and disseminating knowledge on the piloted practices and techniques.

158. As part of this initiative, EU is about to fund the recently established “**Plateforme de la Société Civile sur le Changement Climatique (PSC-CC), Civil Society Platform on Climate Change**”. PSC-CC is composed of 14 organizations from the civil society and acts as a platform for advocacy, dialogue and awareness by committing such organizations in the definition and implementation of policies related to Climate Change. The Platform specifically seeks to consolidate resilience of vulnerable communities to climate change and to build capacity of Civil Society Organizations in their organic role in terms of spheres of influence and strategic interests, communication and compliance and decisions to implement and evaluate policies and programmes related to climate change in Haiti in synergy with the National Adaptation Programme of Action (NAPA) for Climate Change and the Strategic Program of Resilience to Climate Change.

159. EU is also funding the umbrella initiative **Establishment of the Caribbean Biological Corridor (CBC) as a framework for biodiversity conservation, environmental rehabilitation and development of livelihoods options for Haiti, the Dominican Republic and Cuba**. The overall objective of the proposed action is to establish the Caribbean Biological Corridor (CBC) in the Dominican Republic, Republic of Haiti and Cuba, as a framework to contribute to the reduction of biodiversity loss in the Caribbean Region and the American Neotropics, through environmental rehabilitation, particularly in Haiti and the alleviation of poverty as a means of reducing the pressure on biological resources within the CBC. The overarching goal therefore, is to develop an adequate cooperation platform among all initiatives that are being developed or that could be developed within the specific limits of CBC, thereby boosting

the long-term integration of conservation actions among the insular states, contributing in that way to global biodiversity preservation and also as the first step in the integration of a conservation alliance in the Caribbean, based on man-nature relationship. The specific objectives of the CBC are shown in Box 2.

Box 2. Specific Objectives of the Caribbean Biological Corridor (CBC)

- To facilitate the development of CBC actions in an area that includes, particularly, the mountains of western Hispaniola (Haiti and Dominican Republic) and Eastern Cuba, since it represents an important part of the Caribbean biodiversity and is located in the middle of significant corridors of migratory bird species and marine species. These territories are wintering grounds for many birds which have been subject to few conservation actions.
- To facilitate the strengthening of a network of protected areas for the island of Hispaniola and the harmonisation as far as practicable of management procedures in both of the participating countries- Haiti and the Dominican Republic.
- To facilitate the development of alternative livelihood opportunities for the affected communities as a means of reducing pressure on the biodiversity resources and addressing poverty. The CBC is intended to expand conservation actions in protected areas giving a boost to compatible economic options and also to extend those actions to the regions facilitating connectivity among protected areas. The main UN partner of EU in the CBC is UNEP but in collaboration with UNDP and WFP, innovative activities will be planned in order to promote alternative livelihood opportunities by generating demand for local production, through local purchases of the commodities used by existing food based programmes (such as school feeding, mother and child health and nutrition programmes) as well as through risk reduction/ prevention schemes under the overall environmental framework of the project.
- A number of pilot community based projects are being undertaken to demonstrate that the needs of the community can be addressed at the same time as increasing proper stewardship of the environmental resource base, particularly biodiversity resources. This action will contribute to the development of the necessary resources in the participating countries to ensure sustainability of this action at the technical and policy levels.
- To facilitate the establishment of a Tri-National Coordination Structure to support the Implementation of the Caribbean Biological Corridor.

160. In addition to the CBC, EU is also proposing to finance an upcoming initiative entitled **Binational Observatory on Haitian-Dominican Relations**” Environment is listed as an important theme that will receive attention from this Binational Observatory, together with Education, Trade in Goods and Services and Migration issues. This project will be implemented by Universities in both Haiti and Dominican Republic.

IFAD

161. Until 2012, the activities of IFAD-supported projects in Haiti focussed primarily on an increase of water utilization and water use efficiency (i.e. the amount of crop produced per unit of water) through the support of small irrigation projects with innovative technologies such as drip irrigation, with little attention given to the long-term supply or the implications on this on climate change and poor watershed management. However, since 2013, IFAD decided to incorporate climate change considerations into every aspect of its work in the country¹⁵, in order to ensure that adequate attention is given to reduce the vulnerability of smallholder farmers to increased climatic uncertainty. Three resilience-oriented strategic objectives were added to the IFAD/Haiti COSOP: 1) to contribute to mainstreaming climate change in

¹⁵ Haiti COSOP 2013-2018: Country Strategy Operational Program of IFAD for Haiti

pro-poor policies and strategies targeting the ARD sector in Haiti; 2) to promote climate-smart Natural Resources Management through technologies and agricultural practices adapted to climate change; and (3) to locally align territorial projects with adaptation and resilience imperatives. IFAD is currently implementing two projects.

1) *PPI-2: Development of Small Irrigation Systems Phase II (Projet de développement des Petits Périmètres Irrigués)*

162. This project, operating in the North-East of the country (coinciding with Complex 1 of the present project), addresses food security issues among the poorest and most vulnerable families. Its objectives include the sustainable intensification and increase of agricultural production through efficient water management and consolidation of irrigated agriculture, and the facilitate of farmers' access to financial services.

2) *PPI-3: Development of Small-Scale Irrigation and Access to Markets in Nippes and Goave Region*

163. The goal of this project is to reduce rural poverty: its development objective is to improve in a sustainable manner the livelihoods and incomes of rural poor households, especially of the most vulnerable groups. Specific objectives include: (i) sustainable increase of agricultural production through efficient water management and consolidation of irrigated agriculture on both a collective and individual basis; (ii) improving the value of products of irrigated agriculture and farmers' access to markets and financial services suitable to increase the incomes of the poorest families, and (iii) strengthening grass-root organizations planning, organization and management capacity in order to facilitate market linkages and access to financial services. The Department of Nippes coincides with Complex 2 of the present project.

164. Communes targeted by the project in the Nippes include Miragoane, Anse à Veau and Petite Rivière de Nippes. The Irrigation Development component of the project has a subcomponent dealing with Natural Resource Management and Adaptation to Climate Change, where particular attention will be given to environmental and CC adaptation measures (e.g. early warning systems, awareness campaigns, adaptive agriculture techniques, water infrastructure protection, watershed management) that can be applied to enhance resilience through combined actions that protect at the same time investments and people.

165. It was recommended in the IFAD/Haiti COSOP 2013-2018 that IFAD assists the Ministry of Agriculture to set up an Agricultural Adaptation Fund, to provide Haitian farmers with quick contingency funds in case of severe droughts and other weather-linked catastrophes such as flooding.

IDB portfolio

166. The current IDB portfolio touches on a wide range of critical environmental issues that are relevant to the present project, covering both terrestrial ecosystems (including support to protected areas and restoration of ecosystems services, watershed restoration, land rehabilitation and management, vegetation restoration, agroforestry, flood mitigation and food security), and coastal/marine ecosystems (capacity building and institutional strengthening to operationalize protected areas). Of particular relevance are the following:

1) *Natural Disaster Mitigation Program in Priority Watersheds (PMDN/HA-LI041)*

167. This project operates in the North Department (upstream of Grande Rivière du Nord surrounding Limonade Commune, corresponding with Complex 1 of the present project) and in the south (downstream of three rivers, Ravine du Sud, Rivière l'Acul and Rivière Cavaillon, all of which originate from the Macaya National Park and drain into the south coast). It supports investments in public infrastructure for protection against floods and landslides, sustainable agriculture, and institutional strengthening for watershed management. It specifically focuses on institutional capacity development and key

infrastructure works, as well as land management for the immediate protection of certain population centers and to reverse land degradation processes in priority watersheds.

2) *Support to the Three Bays National Park*

168. Within the context of its environmental mitigation commitments assumed as a result of its support to the industrial park inland from Caracol Bay, the IDB proposes to support the Three Bays National Park (in Complex 1 of the present project) with three distinct seedling projects, for a total amount of US\$1.5 million:

- **Project HA-L1055:** support to biological baseline surveys and socio-economic baseline studies for fisheries, mangrove uses and salt use in the areas of Caracol Bay;
- **Project HA-L1076:** development of sustainable alternative livelihoods for the improvement of the well-being of local communities while reducing biodiversity threats;
- **Project HA-T1180:** building managerial capacity of ANAP and administrative and managerial capacity of the PN3B at the field level, including a physical location near Caracol to administer park management, ranger stations, furniture, floating docks, a boat and motor and associated equipment, and motorcycles.

169. IDB support to PN3B to date has consisted of the following actions:

1. Providing technical assistance to the Government of Haiti (specifically the Technical Execution Unit or UTE of the Ministry of Finance) to establish the legal basis for declaration of the Three Bays National Park the PN3B (October 2013, with an updated declaration in April 2014) to establish and operationalize (PN3B)
2. Providing technical assistance to the National Agency for Protected Areas of the Ministry of Environment (ANAP) to establish a Management Committee (*Comite de Suivi*) for the PN3B consisting of ANAP, Ministry of Environment, UTE, UNDP-GEF, and IDB. The *Comite de Suivi* meets regularly and has approved all of the existing and proposed management activities for the PN3B.
3. Providing technical assistance to the UTE to develop and procure consultancy contracts to undertake baseline studies for the Caracol Bay (one of the bays of PN3B) and to plan and implement a program for alternative sustainable livelihoods in Caracol Bay. These projects will also finance the salaries of a Park Director, Monitoring Manager, administrative assistant, and community environmental and outreach workers
4. Working with ANAP and UNDP to identify future funding sources for the financial sustainability of the PN3B.

170. The IDB has furthermore worked on the development of a provisional zoning map for the terrestrial areas of the National Park, in association with the Bank's "Sustainable Cities" initiative. The Bank is also planning to support basic infrastructure, equipment, and staffing needs for ANAP to be on the ground in Caracol Bay through 2015. The specific needs identified by ANAP include (i) a physical location near Caracol from which to administer park management, (ii) two ranger stations for education and enforcement to be located at critical entry routes, (iii) furniture and equipment to ensure that the stations are functional, (iv) two floating docks associated with the ranger stations, (v) a boat and motor and associated safety equipment, (vi) a motorbike and an ATV, and (vii) support for monitoring personnel. If additional funds were available, they would be used to complement the alternative sustainable livelihoods activities mentioned in point 3 described above. IDB is in the short term funding local staff, who carry out community liaison and environmental awareness raising.

171. Over the next 2 years, IDB will be providing the following support (through contracts with national companies/NGOs):

- \$450,000 for environmental awareness raising and community engagement, including the hiring of 30 community level outreach people.
- \$320,000 for infrastructure and equipment for PA management, including 6 community-based people for environmental monitoring
- \$110,000 for economic development strategy and business planning, which will result in 4-5 business concepts such as ecocafes, salt production, and the substitution of charcoal with gas for cooking.

172. National Society of Industrial Parks (SONAPI), the agency responsible for industrial parks (which has taken over administration of the CIP) and SAE (the biggest employer in CIP) are collaborating in the development of a revenue stream from their waste recycling programme to support a local fishers' conservation initiative, which IDB is helping to orient; IDB proposes to explore more structural and financially significant financial streams for local conservation in the NP from the CIP.

173. The initiatives of IDB in the Three Bays NP have been complemented by the project entitled "**Participatory/Multi-stakeholder development of a Locally Managed Marine Area (LMMA) for Caracol Bay, Lagons du Nord-Est Key Biodiversity Area in Haiti**", funded by the Critical Ecosystem Partnership Fund (CEPF) and implemented by the national NGO Foundation for the Protection of Marine Biodiversity (FoProBiM). The outputs expected from this project will be better informed local stakeholders, capable of participating in improved stewardship and management of resources; a community data-verified map of local resources and ecosystems; a Local stakeholder Environmental Steering Committee established; and a Draft LMMA management plan prepared.

3) *Sustainable Land Management of the Upper Watersheds of Southwestern Haiti Project*

174. IDB is also supporting, through the Ministry of Environment, the GEF/LDCF project **Sustainable Land Management of the Upper Watersheds of Southwestern Haiti Project**, which also receives funding from NORAD (see paragraph 152 on NORAD/Norwegian supported actions). GEF/LDCF funding to this project seeks to support forest restoration and implementation of a carbon stock and sequestration monitoring system, to enhance the understanding of impacts on carbon sequestration and reduced emissions tied to changes in land use systems and vegetation/forest cover. The GEF/LDCF project, which is focused on Macaya NP, will achieve its objective through the following components:

- (i) *Institutional and Local Governance Strengthening*: this aims at strengthening national capacity in watershed management, municipal capacity in land use planning, the participatory elaboration of the communal land planning schemes, which will allow for consensus on communal land planning and utilization, including Park limits, zoning and use regulations, and the elaboration of the Park Management Plan, strengthening communal administrative and financial management and design and implementation of a local co-management scheme for the Park involving communes and local NGOs in the conservation and control of different park zones through a communal corps;
- (ii) *Adoption of Sustainable Land Management Technologies* to support activities to improve production revenues from agriculture and livestock among the poor local population. The financial support to be given would consist of a set amount per technology, up to an aggregate ceiling equivalent to US\$500 per producer for the life of the Project. For each technology, the value of the support financed by the Program would include costs of inputs, labor, transportation and technical assistance.
- (iii) *Strengthening of local land tenure framework*, designed to support the clarification of the complex land tenure situation within and around the borders of the Park Macaya as a very important first step in achieving effective protection and management of the Park. The component will finance: a) the design of a physical cadastre of private and state owned land, starting with an

information campaign and resulting in a participatory established mapping of private properties in the Park area and a first design of Park limits; b) setting up of a Conflict Resolution Committee and framework in each of the 10 communes, strengthening of legal local institutions including DGI (Institution responsible for state owned land management) and police in the use of the new framework, and elaboration of agreements on specific conflicts over land tenure; and c) proposal for legally definition of Park limits and its physical demarcation on the ground.

- (iv) Land use, GHG Emission and Carbon Stock Monitoring intended to install the capacities to operate the land use and carbon monitoring system. The objective is to monitor the project contribution to avoid green house gas (GHG) emissions and carbon sequestration in the Park area.

175. IDB is also providing a technical grant of US\$500,000 to the National Early Warning Programme (PNAP), to complement a US\$5 million loan that it gave to the Haitian government to create a network of more than 100 hydro-meteorological gauges and warning stations capable of transmitting local and satellite radio data to PNAP headquarters in the capital. This network is concentrated in the 13 catchments with the highest flood risk. According to OXFAM 2014, the system has some limitations: alerts follow guidelines from a manual that is not of the highest quality, and warnings are based on subjective reports on river levels in neighbouring villages. Furthermore, the system does not yet provide adequate, accurate, and real-time data that could underpin an efficient rapid-response system. Such a system would require an optimized and denser network of automatic warning stations. The data would need to feed into a suitable hydrological model supported by digital terrain information.

The Swiss Cooperation Framework

176. The Swiss Cooperation Strategy for Haiti 2014-2017, prepared by the Directorate of Development Cooperation (DDC) of the Federal Ministry of Foreign Affairs, designated Haiti as a new priority country for cooperation in the context of the enhanced Swiss commitment targeting fragile states. The overall objective of the Strategy aims at contributing to the improvement of livelihoods of poorest people mainly living in the rural areas and the strengthening of the rules of law through the improvement of people resilience and Environment as well the consolidation of institutions. This objective will be achieved in four Departments (West, Nippes, South and South-East), through three main areas of intervention: (i) *Rule of Law and Governance*, focused on delivery of basic services in the field of water and environment, promotion of participatory appraisals and protection of human rights ; (ii) *Agriculture and Food Security* to increase resilience and food security, particularly for women, through the strengthening of important value chains and access to markets and financial services, information and data gathering and monitoring of food security; (iii) *Disaster Reduction and Recovery* focused on methodological tools and specific awareness products, schools infrastructure projects.

177. In the south-east of the country (corresponding to Complex 3 of the present project), DDC supports the Swiss NGO Helvetas in Unit II of Forêt des Pins (Mare Rouge), an area belonging to Belle-Anse commune which represents a forestry continuum with the National Park of La Visite, and where the High Altitude Biodiversity Valuation Programme is being implemented. Swiss cooperation has actively contributed to PAs in Haiti through support to the development and implementation of innovative managerial and control mechanisms and tools, for example by assisting ANAP to design and experiment a platform for co-management of Forêt des Pins NP with local stakeholders platform, as well as developing toolkits (such as the Methodological Handbook to Design and Implement Protected areas Management Plans).

178. Currently, a **2015-2018 Support Programme to Agricultural Production in Haiti** is being developed, two of the three components of which should target the Nippes department (included in Complex 2 of the present project): (i) support to the SYFAAH (Système de Financement et d'Assurance Agricole en Haiti, Agricultural Insurance and Financing System in Haiti); and (ii) the development of

value chains for agricultural products (yams). Switzerland is also playing an important proactive role in the G12 coordination forum for external aid in Haiti, seeking a better complementarity between humanitarian action aids and cooperation for development.

FAO

179. The FAO/LDCF project **Strengthening Climate Resilience and Reducing Disaster Risk in Agriculture to improve Food Security in Haiti Post-Earthquake**, with a total budget of \$8,027,000 (including an LDCF grant of \$2,727,000), was launched in January 2014, and covers two communes in the South-East of Haiti (Belle Anse and Anse-à-Pitre) which coincide with Complex 2 of the present project. The overall goal of the project is to reduce the impact of climate variability and change on vulnerable farmers and livelihood groups by mitigating the impact on natural resources critical to sustain agricultural production, and contribute to food security. The challenge is to adapt agriculture to climate change while simultaneously reducing the risk of future disasters. Integrating disaster risk management and climate change adaption will ensure that structural factors of vulnerability and risk reduction are systematically addressed.

180. The project builds upon previous experiences of technical assistance provided by the FAO in Haiti, and will be highly complementary to the present project: it aims to (i) increase the resilience of vulnerable farmers, including their livelihoods and their agroecological systems, to the impacts of climate change; (ii) contribute responses to the impacts of Hurricanes Isaac and Sandy on the agricultural sector in the target areas; and (iii) promote the integration of disaster risk management and good adaptation practices that increase the resilience of small farmers to climatic vagaries. The activities of the project, which cover Anse-a-Pitre and Belle Anse (both located within Complex 3 of this project) as well as Bainet and Gand Goave further to the west, include the provision of support to grassroots organisations for the production of quality seed, to be distributed to other farmers; the establishment and support of farmer field schools, to test good agricultural practices; and the development and implementation of community-based disaster risk management plans. This project has a specific focus on farming systems, without a watershed- or landscape-wide focus

World Food Programme (WFP)

181. Based on the fact that rural farming communities in Haiti are vulnerable to floodwaters that wash away top soils in many cases destroy their entire livelihoods, resilience building in vulnerable Haitian communities will be at the core of WFP's strategy during the next three years (2014-2017). In a three year project named "*Renforcer la préparation aux situations d'urgence et la résilience*" (**Strengthening emergency preparedness and resilience**), WFP is renewing its commitment to help communities in Haiti protect top soils along with their crops and homes by building infrastructure with the support of local and international partners.

182. Activities will be concentrated in areas more vulnerable to food insecurity and catastrophes and designed to assist 600,000 individuals in serious food insecurity situation. The South-East (Complex 2 of the present project) will be one of departments targeted. Among the objectives prioritized by the project are to: (i) strengthen Government preparedness and its capacity of interventions in case of emergency; (ii) build resilience to facilitate recovery after natural disasters in order to mitigate their impacts; (iii) design a targeting system for the national safety net.

183. According to a WFP report, in 2013, the institution implemented 20 'Cash for Assets' projects at the Haitian government's request. The projects focused on the South-East, West and Artibonite and were later extended to the North and North-East departments. This initiative came just after the consecutive droughts in spring 2012 and hurricanes Isaac and Sandy pushed the number of hungry people in Haiti up to 6.7 million (CNSA). The objective of these projects is to increase food security and economic growth among

communities that are prone to successive shocks. Swiss Cooperation has supported WFP's resilience building activities in Haiti with financial resources of over UD\$1 million. In respect of its new line of action, disaster risk reduction, Swiss Cooperation will continue its financial and technical support, through WFP, to increase Haitians' resilience to disasters caused by natural phenomenon.

184. There is widespread evidence of World Food Programme support to soil conservation works in Complex 2 of the present project, in the form of "food for work" incentives for the construction of stone contour barriers. The focus of these investments on physical measures to address soil erosion problems (by trapping eroded soil carried in runoff water) does not address other agronomic problems that face farmers, especially those that will be exacerbated by climate change, such as the lack of ground cover (which allows surface crusting of soil and particle displacement due to rainfall impact, and the loss of soil moisture due to evaporation), and the scarcity of tree root systems (which reduces rainwater infiltration and the physical resilience of the soil to slumping). Opportunities will be realised through this project for collaboration, whereby LDCF funds will be used to introduce considerations of CC-resilience into the practices promoted by WFP, for example through the establishment of live barriers and/or the incorporation of tree/shrub elements.

World Bank

185. The **Haiti/World Bank Pilot Programme for Climate Resilience (Haiti-PPCR)** was designed to reduce vulnerability to climate change in target regions while forecasting the consequences and impacts of Climate Change on key sectors and strengthening the resilience of both rural and urban communities and promoting long-term climate resilient planning. Haiti-PPCR will be implemented in the coastal municipalities of Port-au-Prince area and on what the Programme calls the Boucle Centre-Artibonite (BCA, the arc formed by the Department of Plateau Central and Artibonite) and was divided into four (4) components with specific objectives:

- (i) *Climate-proofing of Infrastructures for Economic Development in the BCA* in a view to improving the structural network and developing sustainable critical main roads, climate-proofing investments in poles of economic growth and creating an enabling environment for sustainability of investments;
- (ii) *Climate-proofing of Agriculture and Ensure Food Security in the BCA* in order to increase the volume of production of climate resilient crops, enhance communities resilience, protect and expand forestry ecosystems, promote preservation of forests and agricultural research through oriented research, strengthen knowledge management and training on climate resilient agriculture;
- (iii) *Building Climate Resilience and Protecting Population in Coastal Municipalities in the Port-au-Prince Area* aiming at reducing risk factors in the watersheds through works on ravines for floods control and providing livelihoods alternatives for people at risk on the coastline, developing decision-making tools and training materials for municipalities to plan for resilient coastal areas, producing basic data and geo-spatial analysis;
- (iv) *Collecting and Processing Hydrometeoro Data to Inform decision-makers and Development Plans* dedicated to promote an institutional basis for the collection and processing of climate data, rehabilitation of network of hydro-meteorological status, establish training schemes to close technical capacity gap, energize an informed policy dialogue on climate resilience at the country level.

186. The **WB Haiti Disaster Management and Vulnerability Reduction Project** pursues the overall objective to support country disaster capacity response, enhance the resilience of critical transport infrastructure and ensure proper planning of all stages of the involuntary resettlement of families.

187. The **WB/GFDDR Programme of Mainstreaming Disaster Risk Reduction and Building Capacity** provides guidelines and training to mainstream Disaster Risk Reduction (DRR) to key

Ministries. It also works to strengthen donor coordination platforms, update the policy and legal framework of Disaster Risk Management, and assist in developing a monitoring and evaluation system for DRR.

GIZ

188. Fondation Seguin is working with support from GIZ in the protection of La Visite NP, in Complex 3 of the present project, including the provision of planting materials to farmers located in the *altiplano* vegetable growing area, and financial incentives to rehabilitate forest remnants. There would appear to be much need and opportunity to promote EBA among local communities in this high altitude area, given that their current production systems (with complete manual cultivation and virtually trees, windbreaks or soil cover) would appear to be highly vulnerability to climatic variability and change. A probable challenge in this area is the fact that the communities are relatively recently established, which may to some extent explain their apparently limited provisions for environmental and productive sustainability, based on traditional knowledge (apart actions such as the rotation of *zelate* kitchens to develop spots of fertility for vegetable growing, and the sowing of beans in rock interstices to conserve humidity).

189. Opportunities will be explored for institutional collaboration in the support of coffee production in the Thiotte area, given the potential that shade coffee has for ensuring continued vegetative cover of the soil (and therefore contributing to EBA and soil erosion control) as well as generating increased income (and possibly drawing some of the labour force away from fishing). Priorities (which would ideally be cofinanced) would include technical, organizational and financial support to allow improved management and renewal of coffee plantations, as well as marketing support to gain access to premium markets that reward environmental and social credentials. The project could also promote the introduction of CC-resistant coffee varieties and the continued use of diverse shade in order to maximize CC resilience.

AECID

190. The Spanish Government (AECID) and the Spanish NGO Solidaridad Internacional are both active in Complex 3 of this area. SI has supported the development of the land use plan for Anse a Pitre; and AECID has supported the delimitation of La Visite NP, as well as the installation of Fish Aggregation Devices off the Belle Anse coast.

Table 3. Summary of current and planned agencies and donors activities with direct linkages to resilience and adaptation in 2014

Agency	Initiative, Programme or Project	Description	Budget	Status and other observations
UNDP	Building Adaptive Capacity to Address Climate Change Threats for Sustainable Development Strategies in Coastal Communities of Haiti Project	Mainstreaming Climate risks management into development investment framework; best practices of smart-climate actions	\$14,480,000; GEF/LDCF funding	Started: April 2011; ended date/extension: December 2015; project successful at local level; instability with different movements of staff and some issues with objectives linked to capacity building
	Establish a Financially Sustainable National Protected Areas System Project	Protected Areas (Pas) governance system and financial sustainability, diversification of Protected areas incomes	\$ 8,477,273; GEF/LDCF funding	Long implementation delays due to the January 2010 earthquake; ended date/extension: December 2015; a lot of relevant studies in terms of Pas governance and financial sustainability
	Small Grant Programme	Adaptation and mitigation to Climate Change, conserving biodiversity, restoring degraded land and protecting international water	\$1.2 million for 4 years provided by GEF in support of CBOs projects; \$67,000/year: UNDP TRAC funds; \$170,000 from AusAid for Community-Based Adaptation	Important partner for the “ Parc des 3 Baies”; possibility to envisage its involvement in the Nippes department for community-based adaptation climate change options
	Natural Programme of Support to the Disaster Risk Reduction	Hydrometeorological monitoring equipment; Disaster Risk Reduction Roadmap		Structuring project in support of the Ministry of Interior and renewed almost every year by UNDP
NORAD/Norwegian Cooperation	Reducing the vulnerability of the population and Infrastructure in the South Department	Floods protection; nurseries and reforestation; territorial plans; capacity building; Methodological Handbook for Watershed Management;	\$2 million	Project approaching final completion; only reforestation activities; implemented with UNDP
	Revegetation and Transboundary Natural Resources Management	Recovery of forest natural, regeneration, reduction of vulnerability to extreme	\$6 million	Project approaching final completion; implemented in upper Massacre River (North-East) and Pedernales (South-

Agency	Initiative, Programme or Project	Description	Budget	Status and other observations
	Project/Programme Frontière Verte/Frontera Verde	flodings		East)
	Support to Sustainable Land Management of the Upper Watersheds of Southern Haiti Project	Restauration of ecosystems services; local governance and capacity building; National Park Macaya Management Plan; support to local environmental foundations	\$ 9 millions	Concentrations on buffer zones of Macaya National Park; unstability due to movement of staff; implementation scheme in restructuration; implemented with IDB
	Support to the Ecosystem Approach to Haiti's Cote Sud Project	Coastal and marine delineation Protected Area for Baradères/Cayemites; Mangrove rehabilitation in some areas of the Southern Peninsula; coastal/marine management plans; community livelihoods; vulnerability tools	\$US 9,3 millions	Identified as co-funding to UNEP/GEF project in Baradères/Cayémites
UNEP	Ecosystem Approach to Haiti's Cote Sud Project	Ecosystem sustainability and resilience; disaster risk reduction through ecosystem management; reducing land degradation and climate change impact	27,266,000; GEF/LDCF funding; NORAD co-funding	Proposal Preparatory Grant; Complex Baradères/Cayemites as a target zone
	Haiti Pilot REGATTA (Regional Gateway for Technology Transfer and Climate Change) Project	A study on vulnerability analysis for fishery sector in Grand Boucan and Cayemites Peninsula; early warnings;	Between \$ US 50,000 and 100,000	Complex Baradères/ cayémites as a target zone
IDB	Natural Disaster Mitigation in Priority Watersheds (PMDN) Project	Protection of public infrastructure from floods and landslides, institutional capacity	\$ US 30 millions	Interventions in upper Grande Rivière du Nord watershed surrounding Limonade
	Technical Assistance to the establishment of the	Biological and socio-economic baseline studies; sustainable	\$ US1,5 million	Good candidate for co-funding in the context of current UNDP/Haiti/EBA-

Agency	Initiative, Programme or Project	Description	Budget	Status and other observations
	“ Parc des 3 Baies”	alternative livelihoods; building administrative and managerial support to the Park		Resilience Project
	Sustainable Land Management of the Upper Watersheds of Southwestern Haiti Project	Adoption of Sustainable Land Management Technologies; Institutional and local governance; land tenure issues; park delineation	\$ US 30,086,364 with 3,436,364 from the GEF	Considerable co-funding from NORAD and PMDN Project
	Technical Assistance to the National Programme of Early Warning System	Capacity building; maintenance of hydro-meteorological gauges and warning systems	\$ US 0,5 millions	Project approaching final completion
IFAD	Development of Small Irrigation Systems-Phase II (PPI-2) Project	Efficient water management; farmer access to financial services	\$US 26,9 millions	North-East as a target area; good candidate for co-funding and synergy in the context of UNDP/Haiti EBA/Resilience Project
	Development of Small Irrigation Systems and Access to Nippes and Goavienne Region-Phase III (PPI-3)	Climate change adaptation and resilience measures; farmers access to markets and financial services; CBO's strengthening	\$ US 16,55 millions	Nippes as a target area; good candidate for co-funding and synergy in the context of Haiti EBA/Resilience Project
World Bank	Haiti Pilot Programme for Climate Resilience (PPCR)	Climate proofing of infrastructures and agriculture; climate resilience and protection of population in coastal municipalities; collecting and processing hydrometeorological data for decision-makers	\$ US 25 millions	Target Areas: “Boucle Centre Artibonite” and Port-au-Prince metropolitan coastal zones
	Maintreaming Disaster Risk Reduction (DRR) and Building Capacity Project	Guidelines for mainsreaming DRR; monitoring and evaluation system for DRR	\$ US 1 million	Project approaching final completion

Agency	Initiative, Programme or Project	Description	Budget	Status and other observations
	Haiti Disaster Management and Vulnerability Project	Disaster preparedness and responses; resilience of critical transport infrastructure	\$ US 12 millions	Project approaching final completion. PPCR will take over
European Union (EU)	Support for Climate Change Integration in Haiti's National Development Project	Strategic Environmental Assessment and Environmental Impact Assessment; climate smart adaptation agricultural practices; dissemination of resilient practices and techniques to climate change	Euros: 7 millions	Project launched in the first trimester of 2014 however Request for Proposals by EU are in progress. One of the most interesting candidate for co-funding and synergy in the context of UNDP/Haiti EBA-Resilience Project
	Civil Society Platform on Climate Change Project	Resilience of vulnerable communities; advocacy, dialogue and awareness on climate change	Euros: 1 million	Request for Proposals from Civil Society Organizations by EU in progress
	Binational Observatory on Haiti-Dominican Republic Relations Project	Bulletin Notes on resilient actions to climate change in both sides of Haiti and Dominican Republic; joint actions on transboundary Disaster Risk Reduction	Euros: 1 million	Request for Proposals from Universities by EU in progress
	Establishment of the Caribbean Biological Corridor as a framework for biodiversity conservation, environmental rehabilitation and development of livelihoods options for Haiti, Dominican	Strengthening of network of Protected Areas; pilot community-based projects; community alternatives livelihoods opportunities	Euros: 5 millions	Project approaching final completion; main interventions in the North-East

Agency	Initiative, Programme or Project	Description	Budget	Status and other observations
	Republic and Cuba			
Multi-donors/agencies and humanitarian NGO platforms ¹⁶ :	Technical Group of Political Champions for Resilience in Haiti (TG-PCR/Haiti)	Departmental Resilience Frameworks (DRF); departmental coordination mechanism; advocacy for a multi-donors resilience fund for Haiti	\$ US: 75 millions	Haiti: pilot country for the TG-PCR; 3 DRF for North, North-East and Grande-Anse by the time being; funds to be mobilized through existing projects
Swiss	Swiss Cooperation Framework 2014-2018 for Haiti	Improvement of people resilience; Agriculture and Food Security; Disaster Reduction and Recovery; Support to ANAP and Protected Areas	Swiss francs: 79 millions	Interventions in the South-East (Unit II of Forêt des Pins); Food Security Programme in preparation for Nippes department
World Food Programme	Strengthening Emergency Preparedness and Resilience 2014-2017 Project	Soils conservation and ravines protection to build resilience in vulnerable communities; targeting system for national safety net; strengthening Emergency Preparedness and Resilience	\$ US: 2,5 millions	South-East one of three departments targetted
FAO	Strengthening Climate Resilience and Reducing Disaster Risk in Agriculture in Haiti Post-Earthquake	Climate resilience of livelihoods systems; sustainable land and water management practices; climate risk management	\$7 millions including 2 millions from LDCF	Project launched during the first semester of 2014; interventions planned in the South-East (Belle Anse and Anse-à-Pitre); excellent possibility of synergy in the South-East

¹⁶ UNDP, OCHA, USAID, OFDA, OXFAM, WFP, ECHO, ACTED, IFRC, IFAD, FAO

B. CATEGORY II: RELATED INITIATIVES TO RESILIENCE/ADAPTATION

USAID

191. The US Agency for International Development (USAID) is supporting flood control activities through its **Feed the Future-West** project (“Projet Winner”), which is currently in its phase-out and closing phase. These include dredging and channel re-profiling of the Rivière Grise and Rivière Blanche in the Cul de Sac Plain, as well as dredging and resurfacing irrigation channels with concrete bases so as to increase the flow of water to farmland.

192. The most relevant USAID initiative in relation to the project proposed here is represented by the **AVANSE Project (Support to the Valuation of Agricultural Rehabilitation in the North, and Food and Environmental Security)** (*Appui à la Valorisation de la Réhabilitation Agricole du Nord à la Sécurité Alimentaire et Environnementale*), also known as Feed the Future North (FTFN). This project forms part of Feed the Future, a global USAID Strategy to combat poverty and hunger in some specific countries in the developing world. FTFN project, with a budget of US\$87.7 million, is a multisectoral program, which aims to raise agricultural incomes in northern Haiti. The target area of AVANSE coincides with Complex 1 of the present project, covering six watersheds in the North and Northeast Haiti, including Limbé, Haut du Cap, Grande Rivière du Nord, Trou du Nord, Marion and Jassa (Fort Liberté and Ouanaminthe); and it is implemented by Development Alternatives, Inc. (DAI) as the lead contractor. Subcontractors include Agridev and AgroConsult, Making Cents, and PHS.

193. The objective of the project is to increase agricultural incomes in Haiti’s Northern Corridor for at least 40,000 rural households. General activities include:

- Increasing agricultural productivity through generation and transfer of innovative technologies, increased access to inputs, and rehabilitation of irrigation systems;
- Improving watershed stability above selected plains through good governance, farm-level investments, public works, and crisis management;
- Strengthening agricultural markets through improved access to storage and processing facilities and rural roads and increased access to financial products and market information systems;
- Strengthening capacities of local organizations.

194. This partnership will therefore achieve this through key investments in farm productivity, natural resource management, marketing systems, agribusinesses, and agricultural infrastructure. It will focus its investments in five key crops—corn, beans, rice, plantains, and cocoa—and include complementary investments in other agricultural products. The components of particular relevance to the present project are shown in Box 3:

Box 3. Relevant components of the AVANSE project

Natural Resources Management (NRM):

- (1) Training in NRM (and biodiversity) to 10,000 people through (a) CGSBs (Comité de Gestion des Sous-Bassins Versants), (b) associations supported by AVANSE, and (c) external private investments;
- (2) Facilitate large-scale public works to stabilize critical sub-watershed zones targeted by AVANSE;
- (3) Provide integrated pest management control (IPM) especially techniques for greenhouse, banana and miniset sweet potato pest management;
- (4) Incentive programs (through subsidies and free sugar cane cuttings, pineapple plants, etc.) for farmers (covering 23,000 ha) to do NRM and, in particular, to replace erosive crops with non-erosive crops and build hedgerows around their specific plots;

- (5) Establish watershed planning relationships with local government officials (CGSBs) to strengthen existing emergency response systems (Farmer Connect) in view of achieving short and medium term NRM results;
- (6) Depending on agro-climatic conditions and slope contours, support farmers with demonstration plots (model agro-forestry tracts of land and gardens within these tracts) and nurseries for upper watershed crops (e.g., yams, pineapple, coffee, and fruit trees (mangos, cashew, and citrus). (NB: In many cases, areas targeted for such assistance will require specific farm-level hillside protection measures (for example, rock walls, living hedges, and contour bands), integrated into overall crop production plans;
- (7) Support Water User Associations (WUA) through social engineering building solidarity of farmers towards downstream, downstream towards upstream, and upstream (i.e., build strong relations and engagement between WUA and farming communities in the catchment; create democratic solidarity etc.);
- (8) Protect the coastal critical ecosystems (mangroves and lagoons, in the bays of Caracol, Fort Liberté, Limbé, Limonade, and the Acul du Nord) through a program of coastal conservation intended to encourage the adoption of measures for the preservation of critical coastal areas.

Irrigation Component

- (1) Introduce System of Rice Intensification (SRI) already tested (and proven) by FTF Quest but with adaptations to the agro-climatic conditions of the North/Northwest and introduce high-yield varieties of corn;
- (2) Strengthen WUA in management and to develop pilot site systems from the point of view of (1) the creation of formal associations – or reinforcement of those that exist – with the legally enforceable power to require user-fees from farmers accessing water and, (2) Secure (at \$100/Ha) the issuance of clear land-titles according to the procedures of the Institut National de la Reforme Agraire (INARA) to the individual household connected to the system (gravity fed irrigation) as the basis of a mutual agreement between owner-occupant/farmer to secure the investments in the land irrigated by pumps;
- (3) Assure that all irrigation sites are included in MARNDR priority infrastructure plans with access to budget allocations to cover catastrophe planning, when larger repairs are necessary that cannot be covered from WUA budgets;
- (4) Provide integrated pest management control to achieve the expected results from irrigated lands in the plains for rice, corn and bananas;
- (5) Through RFPs (Request for Proposals) enforce irrigation systems;
- (6) Establish a functional Dry Lands Development Grant Fund;
- (7) Establish community watershed plans (participatory approach) enabling POs (Producers Organizations) and local governments to understand landscape problems and develop solutions tailored to their unique environments;
- (8) Facilitate large-scale public works for stabilizing critical zones on the hillsides with the objective to achieve expected results;
- (9) Establish and support local sub-watershed management resource centers in collaboration with le Centre de Formation en Aménagement Intégré des Mornes* to provide technical support to POs and local governments on issues such as data management, and soil conservation;
- (10) Launch nursery production for each cropping system for targeted crops that are part of the technological model foreseen by AVANSE with the objective to achieve the expected results of irrigated lands in the plains;
- (11) Improved planting materials supply chains are set up at each pilot site (which define the main parameters of the AVANSE crop package models to be delivered by IPs/Implementing Partners);
- (12) Launch farmer connect mobile communications platform with the objective to reach the expected results.

195. AVANSÉ will include gully stabilization activities, but not soil conservation in cropping areas. Agricultural productivity will be promoted through the use of fertilizers, pesticides and improved genetic material, as well as the development of value chains and productive infrastructure such as access roads; climate change adaptation will be promoted through the introduction of climate resilient crop varieties from the USA. There is potential for LDCF funds to complement this investment by supporting the introduction of production practices which promote on-farm CC resilience, such as agroforestry, the use of mulches and cover crops, and the use of local drought-resistant crop varieties (as an alternative to imported varieties); and on-farm soil conservation measures such as live barriers with the potential to reduce upstream-downstream impacts in the form of runoff and sediment load (generating downstream resilience benefits and incidental BD benefits in the form of reduced sediment impacts on marine ecosystems).

World Bank

196. The World Bank is financing, with support of Global Agriculture and Food Security Programme (GRASP), the US\$50 million project **Relaunching Agriculture and Strengthening Agriculture Public Services-Phase II (RESEPAG)** that takes over from the closely associated *IDB funded project Farmer Technologies in the North and North-East*. This project includes, among others, three components:

1. *Strengthening the role of MARNDR in providing agricultural support services*: This component will enhance MARNDR's capacity to define and implement the National Agriculture Extension Strategy (PDVA) through, inter alia, the carrying out of institutional and organizational reforms within MARNDR at national, departmental and local levels;
2. *Providing support for local agricultural extension and innovation services*: This component will strengthen the local provision of, and access to, agricultural support and extension services through: (i) the establishment of a Market Support Facility (MSF) to be managed by MARNDR, in coordination with the Tables de Concertation Agricole Departementale, to co-finance on a matching-grant basis the carrying out of investments and/or activities for productive purposes; and (ii) the strengthening of the MSF's institutional capacity.
3. *Agriculture Risk and Emergency Response Contingent Reserve*: This component will provide support upon occurrence of an Agriculture Sector Emergency through: (i) the carrying out of Emergency Recovery and Rehabilitation Subprojects and/or (ii) the implementation of a Farmers Subsidy Scheme for Eligible Farmers.

197. In Complex 1 of the present project, this US\$50 million initiative will promote market-based access to inputs, under the new Ministry Agriculture approach of using demand-priming voucher systems to stimulate demand for planting material from nurseries, for fertilizer and other inputs, thereby strengthening incentives for the private provision of inputs.

European Union (EU)

198. Of particular importance is the €40 million (approximately US\$51 million) **Support to Food Security and Rural Development** project, whose objective is to strengthen food security of 300,000 rural households living in large watersheds in the North-East Department (Complex 1 of the present project) through the reintroduction of sweet potato and the development of new intensive crops around artificial lakes in this department. The main activities of the project include: (i) rehabilitation of irrigated systems; (ii) valuation of the artificial lakes; (iii) improvement of banana productivity; and (iv) development of vegetable, forage and fish production.

UNDP

199. UNDP is funding the **Support Project to Strengthen the Monitoring of Food Security in Haiti (Projet ARSSA)** intended to contribute to the reduction of food insecurity and poverty in Haiti through

dissemination of geo-spatial information and the harmonization of food security programmes in the country. Activities include the improvement of tools for food security monitoring and publication of information on a regular basis, and the strengthening of a Multi-Actor Consultation Facility.

C. INITIATIVES WITH POTENTIAL CROSS-CUTTING RELEVANCE TO CC

UNEP

200. The US\$4,048,000 GEF project **Developing Core Capacity for MEA (Multi-Environmental Agreement) Implementation in Haiti** has the overall objective to enhance capacities for Haiti to strengthen the Government capacity for decision-making in national priority plans with emphasis on forest and coastal/marine ecosystem regeneration. The project will achieve its objective through two components: (i) strengthening capacities for policy and legislation development for achieving global benefits; (ii) generating access to and use of information and knowledge.

UNDP

201. UNDP is implementing a national capacity project, *Strengthening the Capacity of the Ministry of Environment Project (PARC)*, intended to improve the capacity of the personal of the Ministry of Environment in Environmental Impact Assessment and Strategic Environmental Assessment.

Long-term solution

202. The long term solution to the threats affecting the vulnerability of local populations to the impacts of climate change, and the role of natural ecosystems in promoting adaptation to climate change, requires an integrated ridge-to-reef approach which recognises the social and environmental interrelations between fragile mountainous watersheds and coastal/marine ecosystems and the interdependence between CC adaptation and BD conservation. This approach must take into account both environmental sustainability in the medium and long terms, and the short-term livelihood support needs of vulnerable, poor local people, as well as recognising the need to transform the economy through infrastructural, productive and industrial development). This solution will involve the following:

- Activities in marine and coastal zones being located and implemented in such a way as to generate landscape/seascape-wide matrices of complementary and interrelated spatial units, the management of each of which is tailored to its vulnerability to CC, its potential role in EBA, and its productive capacity;
- Protected areas (of appropriate categories defined according to the characteristics of their constituent ecosystems and biodiversity, considerations of regional biological connectivity, the nature and magnitudes of threats and the needs of local communities) being integrated into these landscape/seascape matrices in such a way as to permit controlled use where possible and to promote EBA and other environmental services of benefit to the local populations;
- Local communities being involved in the planning, implementation and governance of protected areas and watersheds, and other forms of natural resource management with implications for EBA.

203. The project proposed here will therefore constitute an essential complement to the baseline initiatives described in the previous section, applying a landscape-wide (ridge-to-reef) focus to address the relations between coastal/marine ecosystems and the watersheds that drain into them; realizing the potential for synergies between BD conservation and EBA; and putting field-level solutions into practice within a strengthened framework of planning and institutions.

204. This solution is in accordance with the provisions of the National Action Plan for Adaptation, which explicitly recognises the relation between poverty reduction and adaptation, and includes in its priorities watershed management and soil conservation (Option 4) and coastal zone management (Option 7).

Barriers to achieving the solution

205. 38. The following major barriers have been identified that prevent the achievement of this long term vision:

1. Lack of an integrated ridge-to-reef vision for EBA

206. Planning and management of the priority watersheds does not take adequately into account the locations, nature and magnitude of environmental values, biological connectivity, threats, the implications of climate change or the livelihood support needs of local communities. The Inter-ministerial Centre for Territorial Land Use Planning (CIAT) is in the process of finalizing the country's first regional territorial land use plan, for the north-east coast region within which the Three Bays pilot site is located. A limited level of experience has also been generated with the development of watershed-level plans, for example through the USAID-supported WINNER project. However, **the regional plan is "broad-brush" in nature, and mechanisms, capacities and experience are still lacking for putting it into practice at local level, and for integrating it with more specific local level plans.**

207. The application in practice of the provisions of regulations and planning instruments is impeded by the **lack of effective governance frameworks at local level:** the Ministry of Agriculture, Natural Resources and Rural Development (MARDNR), whose dependencies are in charge of the agricultural, forestry and fisheries sectors, has severely limited financial, technical and human resources and as a consequence virtually no field presence for the promotion and enforcement of the regulatory framework.

208. Similar capacity gaps at institutional and local levels result in **limited access by local people to alternative, more sustainable practices** for farming in vulnerable watersheds and for managing and exploiting other resources such as mangroves in a sustainable manner. This situation is compounded by a lack of consistency and harmonization between agencies and institutions and limited clarity on the environmental sustainability of alternative management practices.

209. Systems at central level for development planning, knowledge management and decision-making are insufficient to support the integrated management and conservation of natural resources in watersheds and coastal and marine zones. The current SNAP project is helping to create a favourable overall environment for effective PA management, by developing a strengthened PA governance system, backed by policies, regulations and competent institutions. Still lacking, however, is the incorporation of a more integrated, landscape/seascape wide, approach to delivering environmental benefits of global, national and local significance and addressing the implications of climate change. An **overall planning framework is missing in practice:** a National Action Plan for Integrated Management of Watersheds and Coastal Areas (IMCAWA) was proposed by the Ministry of the Environment (MdE) in 2004 but has yet to be made operational through the plans and programmes of different sector institutions; neither does it adequately incorporate considerations such as tradeoffs and synergies between environmental and development considerations, regional biological connectivity, or the implications of climate change.

210. There are also deficiencies in the mechanisms for informed and balanced decision-making in relation to development initiatives with implications for the status of biodiversity, the sustainability of the natural resource base, and resilience to climate change. Legal provisions exist for Environmental Impact Assessment (EIA) but **technical capacities are virtually inexistent in the MdE for the development of terms of reference and the review of Environment Impact Statements.** As a result, there is no way of ensuring the quality and reliability of EIA findings, or that the concerns and needs of local communities

are taken into account in the processes of scoping and impact prediction, which means that advantage is not taken of opportunities for synergies between local needs and traditional practices on the one hand, and effective environmental management and mitigation on the other. The high level of spatial interactions between social, biological and productive practices at the major watershed level means that a strategic approach to impact assessment is required: at present, however, there is **no provision for or experience with Strategic Environmental Assessment (SEA) in the country**, beyond that applied to the aid programmes of individual agencies (such as USAID).

211. Significant capacities for information management have been developed in the National Centre for Geospatial Information (CNIGS) with support from the European Union. Informed and balanced environmental decision-making (for example through EIA, SEA and territorial land use planning) is further hindered, however, by the **inadequacy of mechanisms for ensuring that decision-makers are aware of and have timely access to the kinds of information that are required** to maximize the objectivity of decision-making.

2. Inadequate capacities to put PA proposals into practice in the marine and coastal zone

212. For historical and cultural reasons, the marine environment has not been a focus of the government, international NGOs or international and bilateral aid agencies in Haiti until about 2010. In 1926, the New York Zoological Society funded a major marine biological expedition to Haiti and filmed the coral reefs teeming with large fish. During the 1980s, several attempts were made to start a marine conservation program. In 1985, USAID funded a Haiti Country Environmental Profile that, following field studies, recommended that GOH establish four Marine Protected Areas at the Arcadin Islands, Ile a Vache, Acul Bay/Cadras and Baraderes/Cayamites. Subsequently, in 1989, USAID and the Worldwide Fund for Nature drew up a plan to establish the Arcadines Marine Protected Area. None of these plans were implemented. By 1992, USAID funded the Florida Museum of Natural History to draft a “Stewardship Plan for the National Parks and Natural Areas of Haiti,” but this was entirely focused on terrestrial areas.

213. In 2000, Jean Wiener, a Haitian American marine biologist drafted a recommended list of nine proposed MPAs adding five to the list proposed by the USAID study: two in La Gonave island, Gonaive, Rochelois Bank, and Caracol/Fort Liberte. Wiener also began a series of rapid assessments of coastal areas of Haiti investigating water quality, mangroves, turtles, manatees and other flora and fauna for USAID, UNEP.

214. By 2007, a major 141 page report by USAID entitled “Environmental Vulnerability In Haiti: Findings & Recommendations” did not address coastal and marine topics at all. The next two attempts to evaluate Haiti’s biodiversity essentially ignored the marine environment. As recently as 2010, the CEPF Environmental Profile report for the Caribbean region stated, “The marine realm is not a significant focus for this profile because the region merits its status as a hotspot due to threats to its terrestrial biodiversity.” The rationale in that case was that there had been a great deal of marine biodiversity work and marine conservation investments in other countries of the Caribbean, however this represented a missed opportunity to review Haiti’s coastal and marine biodiversity.

215. One reason for this lack of attention to marine areas has been the almost complete lack of marine science education available in Haiti from elementary school to university level. Haiti’s educational system has followed a traditional French model focusing on agronomy, chemistry, or physics in the sciences, law, medicine, architecture etc. There is one MSc and one PhD biologist at the National University with a marine science background, but very few classes are offered relating to marine science and there is no marine science major course of study. In contrast, universities in other Caribbean countries such as Cuba, Barbados, Guadeloupe, Jamaica and Trinidad and Tobago offer undergraduate degrees, Masters and PhDs

in marine science. As a result, there are very few peer-reviewed scientific publications on Haiti waters, none at all on coral reef ecology and only a handful of technical reports.

216. In order to develop a coherent sub-system of marine and coastal PAs, within the overall framework of the National Protected Areas System, it is necessary for their spatial layout to be defined, including the definition of their external limits, and of the boundaries between internal zones subject to different regimes of management and protection. At present, there are **inadequate mechanisms, capacities and experience for the detailed spatial planning of individual PAs to be carried out**. Specifically, information is lacking on the precise nature and locations of the biodiversity values to be protected, of the local and regional biological processes to which they are related, of the threats that affect them, and on local people's livelihood support activities. This makes it difficult to determine for example how large they need to be in order to conserve viable populations of the target species, how important a role biological corridors might play in ensuring long term population viability, and in which locations special attention needs to be given to harmonizing conservation with the livelihood support activities of local people.

217. According to a recent MPA policy gap analysis, government systems to manage new MPAs (or MMAs) are very limited.¹⁷ Currently Marine Protected Areas are under the jurisdiction of the National Protected Area Agency (ANAP) of the Ministry of Environment that was established by decree in 2005. That decree shifted the role of PA creation and management from the Ministry of Agriculture to the Ministry of Environment. Gaps identified by the report in this administrative system include:

- No clear legislation on any aspect of the management of an MPA and/or its resources, including ecosystem services, through either private, local, or co-management methods or on any aspect of the method of delimitation of an MPA;
- Law enforcement agencies have not been trained with respect to MPAs;
- Fisheries laws insufficient, outdated, and not enforced;
- No financial mechanism established to fund PA management.

218. The report further recommended that the GOH should:

- Ensure that MPA planning and implementation is integrated into national protected area development and management plans;
- Update laws and regulations for MPAs especially fisheries regulations taking into account current realities, updated scientific knowledge, local knowledge, and cultural sensitivities/requirements;
- Ensure that discussions on the needs and benefits of creating MPAs are undertaken at all levels of Haitian society from the President/Ministry to the local communities;
- Develop a mechanism to ensure long-term financing for the development and management of MPAs.

219. Furthermore, there are **severely limited capacities for developing and implementing management plans**, on which the long term sustainability of the target PAs will depend. These capacity limitations cover areas including the identification and characterization of threats; the formulation of biodiversity conservation strategies (and in particular options for harmonizing local development priorities with conservation goals); the development and application of indicators for the monitoring of biological, social and institutional capacity variables; financial management; and the strategic planning of financial and other resources.

¹⁷ Weiner, J. 2012. Draft **Analysis and Identification of Gaps in the Existing Legislative Framework Related to Marine Protected Areas in Haiti**. 40pp.

220. The Ministry of Environment has a reasonable budget and staff assigned to each provincial “Department,” however, many are actually based in Port au Prince. ANAP has only a handful of staff, inadequate to manage the old and new PAs. Due to the lack of marine biology and oceanography training available in Haiti, no MDE/ANAP staff members have experience with marine biology or management. At this point, the only resident Haitians trained in marine science other than the two professors at the National University are the 30 graduates of the Reef Check EcoDiver training courses, two of whom have been hired by MDE to work on marine monitoring in the UNEP/CSI program in the south.

221. Other than the two MDE Sud staff noted above, no staff have been assigned to these new PAs. The Centre National d’Information Geo-Spatiale (CNIGS) is available to help with mapping but has not been trained in Marine Spatial Planning, so there is a pressing need to train government staff in several Ministries and at all levels in Integrated Coastal Management/Marine Spatial Planning via workshops.

222. At this time, the process of MPA declaration in Haiti could be classified as a “top-down approach,” with little consultation with local communities, especially fishermen. Boundaries for the PAs have been written into law without public consultation or public comment.

Stakeholder analysis

Government

223. The two most important institutional stakeholders of the project, at central level, are the **Ministry of the Environment (MdE)**, and in particular its **National Office for Protected Area Management (ONAGAP)**; and the **Ministry of Agriculture and Natural Resources (MARNDR)**. The MdE will be the executing agency for the project. It also presides over the **National Environment Council (CONAE)**, in which different coordination and participation structures are represented. The **Inter-ministerial Commission on the Environment (CIME)** is presided by the Prime Minister and involves the Ministers of Environment, of Public Works, Transport and Communication, and of Public Health and Population. The Ministry of Planning and External Cooperation (MPCE) is the lead entity in relation to territorial land use planning, which is however coordinated through an **Inter-Ministerial Committee on Territorial Land Use Planning (CIAT)**.

Individuals among the target population

224. At local level, the main groups of individual stakeholders potentially participating in, influencing or affected by the project are:

1) Fishers:

225. Fishers are the principal source of the impacts affecting marine ecosystems in the target areas: the overextraction by them of herbivorous fish is leading to the uncontrolled growth of algae on coral reefs, resulting in coral mortality and the undermining of other marine and coastal ecosystems that are ecologically linked to the reefs. Overfishing is also inherently unsustainable, as shown by the small sizes and numbers of fish that are currently caught, and will eventually lead to complete collapse of the fisheries in question and of the livelihoods that depend on them. Fishers will be affected by climate change, as rises in sea level and sea water temperatures threaten to increase rates of coral mortality further, thereby further undermining the ecological processes on which fisheries depend: in addition, fishers’ villages are typically very low lying and therefore susceptible to flooding and wave impact associated with CC-related sea level rise and storms.

226. During the PPG phase participatory workshops were held with members of fishing communities in all three target complexes, in which community members summarized their situations and their main issues of concern (see Box 4), which may be summarised as follows:

- A very large proportion of the members of coastal communities (many thousands of people) are involved in fishing (see paragraph 30)
- Most fishers are also engaged in agriculture as a complementary livelihood support strategy
- Fishing itself is dominated by men, but the trade in fish is dominated by women
- Fishing is principally carried out using very rudimentary methods (small dugout canoes propelled by oars and sometimes sails): this limits how far from shore they can fish, and means that most pelagic stocks are not accessible to them
- Fishers mostly have limited access to markets, and to the facilities (such as cool rooms) required to get their catch to market in good condition.
- Fishers have very limited access to technical support and credit
- Many fishers have aspirations to improve their catches by using FADs, and motor boats that are necessary to travel out to them
- A number of Government institutions and international agencies have provided FADs, boats and other equipment to fishers, but with variable results: in a number of cases the equipment has been sold to raise cash
- Fishers are often highly aware of environmental issues, but fail to recognize the significance of overfishing for coral reef health and overall ecosystem function.
- There are significant numbers of fisher organisations, particularly in Complex 3, but these suffer at times from problems of limited organizational consolidation.

Box 4. Issues prioritized by fishers in the target complexes

Caracol (Complex 1)

- There are two fishing organizations with together about 150 members. However, the fishers say that almost everyone fishes, so there must be several thousand fishers. They say that there is no conflict between the two organizations. Many fishers come from outside the zone and practice 'bad' fishing: small mesh nets. Fishers from Chavanaux cut mangroves in order to catch fish in the mangrove areas. Some fishers (from outside the zone) use an air compressor: this brings fish to the surface where they are then shot with a spear gun. There is also a technique called 'ralemtou' in creole, which somehow uses a loud noise to scare fish to move to the surface where they are then shot (by spear).
- There was a FAD but they say it benefited the Dominicans more than the Haitians. It was destroyed by fishers "who didn't know how to use it". The fishers do not seem very interested in FADs. Their problem was to get out to the FAD because the fishers practice what they call 'traditional fishing': i.e. using canoes without motors. They row their boats—not using sails, and fish with a line. They say they can still catch large fish: Barré, Sacdoré, Caran, Tazar, poisson rose, Dorade, Boutou.
- They get ice from Cap Hatien and put fish in an 'igloo' (an insulated container). The fish are sold in Cap. They cut up the larger fish. They have two pickups to take fish to Cap.
- The women are involved in the commerce. They borrow money at 20% to buy fish from local fishers and then sell the fish in Cap. They do not sell fish to the Caracol Industrial Park (it is not clear why not);
- The Trou de Nord river floods the town regularly. It carries silt and sedimentation and the river mouth is blocked and silted up. When the river is in flood it carries all sorts of refuse and trash;
- The mangroves are being cut for charcoal. The wood is used as fuel by bakeries and dry cleaners.
- The river passes inside the Industrial Park. The fishers are concerned that if the river is polluted by chemical pollutants this will adversely affect the fish (they cited 'mazout': this is fuel oil used for the diesel generators. They should be no particular risk from this fuel being used to generate electricity. The fishers say there has been no pollution so far.)
- FFTP gave the fishers 4 boats (20 ft) with 25 hp engines.
- The Brigade Maritime en Action (BMA) is trying to stop the cutting of charcoal. They have volunteers.

Pestel (Complex 2)

- Only small fishes are now being caught. There are increasing conflicts among the fishers because of the small

catches. One Cayemite zone imposes net mesh size rules on fishers from other zones

- The fishers want better fishing gear: boats, engines; and materiel for conservation: cold chain. Most fishing is with canoes (dugouts). The fishers use *seine*, *nasse*, lines, nets, and spears. They can catch bigger fish in the 'canal' but cannot keep them from spoiling;
- More than 10,000 fishers are registered with the local associations. Almost everyone fishes. Schoolchildren fish to get money for school. Men higher up in the watershed also fish.
- Signs of increasing drought (the zone went for 7 or 8 months without rain). The fishers say there are more fish when it rains. There is a problem finding water for the *jaden lakou*. Houses capture rainwater but it is insufficient. Although there are many springs, they are not capped and are generally polluted by animals using them, so they cannot be used for drinking.
- Fishers are not interested in alternative livelihoods on land. They are fixated by the idea of FADs. They state that a single FAD can support 400 fishers. They say agriculture is too risky. The zone produces lots of manioc, cassava, malanga, mozambel, sweet potatoes, and yams, but the fishers don't believe that agriculture can produce a reliable weekly income.
- In the past there were 'sea cucumbers'. They say that the Japanese came and captured them. They are now much fewer. The fishers believe fish eat the sea cucumbers, so this is another reason why there are fewer fish.
- The Pestel deputy proposed banning small mesh nets. The deputy proposes to change net fishers into line fishers working the FAD.
- Other issues: The fishers say mangroves are being cut for charcoal at night. Flooding by seawater is a problem: Pointe Sable is the most vulnerable area. There is no system for micro-credit (only at Beaumont). There is no healthcare system. There are no doctors when children get sick.

Belle Anse (Complex 3)

- There are 12 fisher organizations in the commune, but only 500 fishers registered with the union of fishers. However, almost all the men and boys fish. There are seven communal sections and six of them have a coastline. Women also fish. Fish is sold in Belle Anse to traders, and also in Marigot and the DR. Certain species cannot always be sold in the DR because the season for these species is controlled.
- All fishers also practice agriculture. Maize is planted in March and harvested in November. There is an irrigation system. They also grow millet and beans. Fishers say that runoff from erosion blocks the reproductive cycle when fish lay eggs. They see erosion and siltation as the main problem for fishing and the main reason fish are smaller.
- There has been drought for the last 2 or 3 years. There is no food for the animals—which are thin and malnourished. There is no forage. The animals are free to roam (*elevage libre*) but the dry forest area to the north of the town provides little nourishment.
- Support for fishers comes through the Department at Jacmel and the CAECID-funded project with the MARNDR. This includes training, and fishing in the canal. There is an office in Jacmel: the project covers the 8 communes in the south-east.
- Nine boats with motors have been given to the fishers at Belle Anse. Ten more boats have been promised. Food for the Poor (FFTP) gave four boats to two fisher organisations. FFTP is said to be building a fishing village with 20 houses and a solar-powered freezer.
- In deep water, fishers catch tuna, marlin, and dorade. They need to be able to conserve (refrigerate) the fish—which they cannot do at the present time. They take larger fish to the DR but get only a low price. Marigot cannot handle large fish either.
- There is no microcredit. The fishers want encadrement.
- There were four FADs installed: 2 from the MARNDR project; 2 from FFTP. Only one FAD is left: the others were lost because they were 'poor quality'. Ten boats now go to fish around a single FAD whereas only three boats per FAD is the recommended ratio.
- They say that as much as 2,000 lbs of fish could be caught around a FAD in total by all the boats on a good day. The next day there will be no fish and the fishers wait 2 or 3 days before going back. However, they still have the problem of conserving large fish.
- The fishers want more FADs and boats with 15 and 40 hp motors (the 15 hp engines burn less fuel). They have to get gas for the outboards in Marigot

- They fish around a Dominican FAD which is in Haitian waters, although the Dominicans try to prevent this.
- The women dry fish using solar drying. They want small materials, such as cool boxes, knives and aprons.

2) Farmers

227. Farmers are threatened by climate change, one of the impacts of which will be to disrupt the rainfall patterns on which their rainfed cropping systems depend. They are also important stakeholders of the project inasmuch as their agricultural activities have direct impacts on populations and ecosystems downstream.

228. In common with most of Haiti (see paragraph 8), most of the farmers in the three target complexes are poor smallholders. Nationally, total farm size averages around 1.5ha and the area that farmers have under cultivation at any given time (SAU or *Superficie Agricole Utilisée*) ranges from 0.5 to 1.1ha. With regards to the target complexes, the North East Department (Complex 1) has an average SAU of 1.12ha, Grande Anse and Nippes Departments (Complex 2) 0.80 and 0.68ha respectively, and the South East Department (Complex 3) 0.63ha. The larger SAU in Complex 1 reflects the presence there of extensive coastal plains. Apart from these plains and limited valley bottom areas, farming is largely practised on steep hillsides, with poor soils and limited or no opportunities for irrigation or mechanization: it is principally of a rotating slash-and-burn swidden pattern, and the crops are largely of a subsistence nature but with some (variable) surplus for markets and some specific cash crops.

Box 5. Issues prioritized by farmers in the target complexes

Trou du Nord (Complex 1)

- The farmers produce beans, maize, peanuts, manioc, sugarcane, and plantains, frequently in mixed cropping patterns. There is also cocoa.
- Livestock mainly consists of beef, goats, and pigs.
- Access to markets is good. But agriculture is mainly rainfed, so diminishing rainfall is starting to be a problem. The farmers say that there is drought. Credit is not available. Agriculture is “archaic”. There is poor infrastructure: agricultural feeder roads to the upper watershed areas are bad; there is no electricity. Free range livestock often conflicts with vegetable gardens.
- There is no agricultural credit or agriculture shop where they can buy seeds, pesticides, etc..
- The river Trou de Nord has flooded the town several times. The BAC (Bureau Agricole Communale) is not present.

Baraderes (Complex 2)

- The river flooded the town in 2012. The water line on the walls in the town can clearly be seen at about 1-2 meters high. The river mouth is now blocked by sediment and silt and this increases the risk of future flooding. There used to be fish in the river but not anymore. Certain sections of the river bank are protected by gabions;
- The zone was a major producer of mozambel (taro) but the variety is plagued by a fungus.
- Coffee was cut back years ago for charcoal. Beans (*‘pois noir’*) were planted in its place;
- Section 1 produced coffee then beans. Mango trees were cut for charcoal; Section 2 produces millet, plantain, beans; Section 3: coffee, cocoa, tomatoes, beans, yam, manioc; Section 4: sugarcane, coconuts, plantains, rice, breadfruit; Section 5 (coastal): fishing;
- In the town itself, agriculture includes mozambel, rice, coconuts, plantains, breadfruit (said to be wasted). Every Section has lots of mangoes—which are not commercialized;
- Rainfall is unreliable, and potable water is big problem. There are many springs in the area—but if not capped, water is polluted by animals drinking at the spring;
- Agricultural produce which is perishable is ruined before it gets to market because of the bad roads;
- Livestock are important—but practice is described as anarchic (extensive and not regulated). There are cows, pigs, goats, sheep, horses and of course chickens. The town dogs are said to attack and eat the goats;

- The main problems cited by the farmers are erosion and deforestation caused by unregulated agriculture. Then communication / transport / markets. Insects (crickets) are also a problem.
- Charcoal is said to be the most important commercial activity.

Seguin (high altitude zone of Complex 3)

- Problems cited are environmental degradation: deforestation and erosion.
- There are no environmental agents in Parc La Visite NP, and no judicial presence or police.
- The farmers say there is no organizational and technical support, and no agricultural credit. They cannot buy fertilizer. Animals die from disease. Hurricanes also kill animals (cows, goats, sheep and pigs).
- They buy seeds in Kenskoff but complain about the quality of the seeds from Agroservice (a private firm).
- The farmers perceive increasing problems of drought: women have to go farther to find water.
- Farmers maintain some traditional practices such as the use of *jaden lakou* as nurseries for vegetable seedlings because the soil is more fertile.
- The farmers say they have almost zero relationship with the State. The BAC is not functional. NGOs past and present include Helvetas, ACDI/VOVA, Care Haiti, Souke (Canadian), Action Developpement Durable, and Caritas.
- Farmers want technical support, a training center, agricultural credit, microcredit, and agricultural and veterinary agents. The women want to produce coffee.

Local organizations

229. There is a wide range of Community-Based Organisations (CBOs) in the target complexes: during the PPG studies, a total of 69 were identified, related to diverse issues including agriculture, fisheries, fisheries and agriculture, health, education, environmental management and natural resources. Many CBOs were created during the 1980s under the leadership of state government, to meet specific objectives of the government but without having decision-making power. With the advent of NGOs during the period 1987-2000, CBOs began to participate in discussions on the future of their communities: in general, however, they tend to be poorly structured and consolidated. Most of those encountered during the PPG phase were created as part of a collective strategy of endogenous control, as a response to specific community concerns in the areas such as fisheries, agriculture and local development; there are other which have been especially created with the arrival of NGO projects; and other that are “opportunistic”, lacking functionality at present but waiting to become legitimate community interlocutors if opportunities arise. Approximately 70% of the CBOs in the target complexes address agricultural issues, 85% fisheries and 10% cover both areas.

230. The following 6 main types of CBOs were identified during the PPG phase:

- 1) Groups of producers and/or traders, typically formed by farmers with limited resources in order to enable them to gain the critical mass necessary to income generating activities such as food production and the purchase and resale of small cattle (sheep, goats) and poultry.
- 2) Self-help and community emergency groups, that address the technical, operational and financial constraints to the protection of lives and property in the communities, in relation to issues such as fire, flood and territorial defence.
- 3) Service provider groups, that address a range of different issues including technical support (of variable quality) to farmers, storage facilities for agricultural inputs/products, girls’ education and arbitration in conflict management.
- 4) Opportunistic groups
- 5) Groups involved in issues related to the development of local communities
- 6) Groups advocating the sustainable use and management of natural resources and the environment

NGOs

231. The project will collaborate closely with a number of national and international environmental NGOs which are active in research and conservation activities in marine and coastal areas in the country, including the **Nature** Conservancy, which has carried out detailed studies of the condition of coastal and marine resources on the southwest peninsula, has developed proposals for their sustainable management, is developing baseline studies for the PN3B in Complex 1 and is executing the USAID-funded Caribbean Marine Biodiversity Activity there; **ReefCheck**, which has carried out evaluations of the conditions of around 2/3 of the country's coral reefs; **FOPROBIM**, which is involved in mangrove reforestation, sustainable harvesting of alternative products of mangroves such as honey, and evaluations of the status of marine and coastal resources (especially in the southwest Peninsula); and the Audubon Society.

PART II. STRATEGY

Project rationale

232. The principal elements of the project rationale are as follows :

- The human population on the hillsides and coastal zones of Haiti are highly vulnerable to the impacts of climate change (changes in rainfall patterns undermining rainfed cropping systems; extreme winds during storm events damaging crops; extreme rainfall during storm events causing soil erosion, landslides and flash floods downstream; and storm events and sea level rise causing coastal flooding), warranting investment of LDCF resources.
- Globally important biodiversity in coastal and marine areas in Haiti, at species level and ecosystem level (particularly coral reefs and mangroves) is subject to diverse and severe threats, warranting investment of GEFTF resources in the biodiversity focal area.
- As well as determining the CC resilience of hillside populations, watershed management practices are strong determinants of the threat levels affecting coastal and marine biodiversity due to upstream/downstream impacts, and, in turn, coastal and marine ecosystems (coral reefs, mangroves and sea grass beds) are vital buffers against CC-related sea level rise and wave impacts; these interrelations argue for the combination of LDCF and GEFTF funds in an integrated project.

Policy conformity

233. The project will contribute specifically to the following adaptation options prioritized by Haiti's National Action Plan for Adaptation (NAPA):

- 1) **Watershed management and soil conservation**, through the promotion of CC resilient agricultural practices and direct investment in ecosystem rehabilitation in watersheds proposed under Component 1;
- 2) **Coastal zone management**, through the actions proposed under Component 2 in support of the conservation of coastal and marine ecosystems, which will simultaneously protect their Ecosystem-Based Adaptation (EBA) functions, and will be complemented by direct investment in the rehabilitation of these ecosystems under Component 1;
- 3) **Valuation and conservation of natural resources**, in both watersheds and in coastal zones, and including soil and water resources, tree resources both on and off farm, coastal and marine ecosystems, and fish resources which are vital both for livelihoods and for maintaining the health of coastal ecosystems (especially coral reefs);
- 4) **Preservation and strengthening of food security**, by increasing the CC resilience of rainfed subsistence agriculture on hillsides; increasing the sustainability of fishing; and working with partners to offer coastal populations alternative options for livelihood support and food security, thereby reducing their dependency on fishing.
- 5) **Water protection and conservation**, by promoting watershed management practices that conserve soil humidity and facilitate runoff infiltration; and
- 8) **Information and education**, by carrying out environmental education and awareness-raising campaigns regarding the importance of coastal and marine ecosystems, by supporting the incorporation of CC-resilience and EBA considerations into agricultural extension programmes and by strengthening the focus of higher education programmes in the country on marine biology.

234. It is also in conformity with the National Action Plan for Integrated Management of Watersheds and Coastal Areas (IMCAWA), developed by the Ministry of the Environment (MdE), which recognises the importance of applying concepts of IMCAWA whereby coastal areas and their associated watersheds are treated as a single unit; the efforts of different sectors are integrated; mechanisms for planning soil and water management are applied to the entire watershed and take into account the ecological needs of coastal and marine systems which they influence; and water resources management and planning are viewed as a multidisciplinary process and included in a framework that seeks collaboration among all relevant agencies at national, watershed and community levels. In line with the focus of the project, the IMCAWA plan covers four strategic areas: I: Restoration of critical coastal ecosystems and associated watersheds, II : A new Institutional and Legal framework to address Integrated Management of Watersheds and Coastal Areas, III : Reduction of Communities' Vulnerability to Natural Disasters and IV: Transboundary Cooperation in Integrated Management of Watersheds and Coastal Areas with Dominican Republic.

235. The project will contribute to the objectives of the National Environmental Action Plan (EAP), to i) strengthen and rationalise the management of the environment, ii) restore the ecological equilibrium of watersheds through the implementation of norms for exploitation and best practice; iii) improve quality of life through improved management of urban and rural zones, as well as the valuation of the conservation of natural and cultural heritage; iv) provide a framework for improving coherence between plans and programmes in the environment sector. It is also in line with the Three-Year Plan (2012-2015) of the MDE, which identifies four areas of action, three of which are related to adaptation: 1) risk reduction, through reforestation, and the integrated management of watersheds and coastal and marine zones; 2) strengthening of environmental governance; 3) sustainable management of terrestrial protected areas and natural spaces. Its specific objectives, to which the project will contribute in concrete terms, are to i) increase forest cover from 1.5% to 5%; ii) reduction pressures on forest resources by 10%; reduce the environmental vulnerability of the populations of watersheds through the integrated management of floods and risks; iv) increase the resilience of coastal communities through actions aimed at the sustainable increase of goods and services related to coastal and marine resources; v) change Haiti from a country affected by risk to one that can live with risk.

National strategies and plans or reports and assessments under relevant conventions

236. At the international level, Haiti participates in different international conventions. The most important for the present project are the Convention for the protection of the flora, fauna and American natural landscapes (1941), and the Convention on Biodiversity (CBD).

237. Haiti's current environmental legislation provides a basic framework for the conservation and sustainable use of biodiversity. The Government has developed an array of legal measures to facilitate the management of the environment, initiated by several sectoral Ministries. The General Decree on Environment, prepared by the Ministry of Environment, was approved in November 2005 and promulgated to the Official Journal of the Haitian State on January 26, 2006 (161st Year, Number 11). The approval of this Decree represents, in theory, a major step in terms of prospects to solve jurisdictional conflicts in environmental management in the country. It contains a specific Chapter dealing with Biological Diversity (art 135 – 139).

238. In December 1999 the Haitian government, with the endorsement of the Council of Ministers, published the **National Environmental Action Plan (NEAP)**. The NEAP is the major policy that offers guidance on all aspects of environmental management. The specific objectives are to:

- Strengthen and rationalize the management of the National System of Protected Areas;

- Restore the ecological balance of watersheds through the implementation of exploitation norms and best practices;
- Improve the quality of life through a better management of urban and rural areas as well the valorization and conservation of natural and cultural heritage;
- Provide a framework to reach a better coherence among plans and programmes within the environmental sector.

239. The **National Action Plan for Integrated Management of Watersheds and Coastal Areas (IMCAWA)**, developed by the Ministry of the Environment (MoE)⁸ recognises the importance of applying concepts of IMCAWA whereby coastal areas and their associated watersheds are treated as a single unit; the efforts of different sectors are integrated; mechanisms for planning soil and water management are applied to the entire watershed and take into account the ecological needs of coastal and marine systems which they influence; and water resources management and planning are viewed as a multidisciplinary process and included in a framework that seeks collaboration among all relevant agencies at national, watershed and community levels. The IMCAWA plan covers four strategic areas: I: Restoration of critical coastal ecosystems and associated watersheds, II : A new Institutional and Legal framework to address Integrated Management of Watersheds and Coastal Areas, III : Reduction of Communities' Vulnerability to Natural Disasters and IV : Transboundary Cooperation in Integrated Management of Watersheds and Coastal Areas with Dominican Republic.

240. The **National Action Plan for Adaptation (NAPA)**, of October 2006, was developed through a highly participatory process involving local communities throughout the country. The specifically recognises four aspects of vulnerability to climate change: soils and desertification; the agricultural sector; coastal zones; and water resources. It emphasizes the links between poverty reduction and adaptation, and prioritizes actions in relation to the sectors of soils and agriculture, coastal zones, forestry and water resources. Specifically, it prioritizes 10 options for adaptation: 1) watershed management and soil conservation ; 2) coastal zone management; 3) valuation and conservation of natural resources; 4) preservation and strengthening of food security; 5) water protection and conservation; 6) construction and rehabilitation of infrastructure; 7) waste management; 8) information, education and waste management.

GEF focal area and/or fund(s) strategies, eligibility criteria and priorities:

241. The project will contribute to Strategic Objective 1 of the GEF Biodiversity Focal Area, to "Improve Sustainability of Protected Area Systems". It will also contribute to Aichi Strategic Goal C (To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity) and specifically Target 11, related to the increase in the proportion of coastal and marine areas which are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes⁹. It will also contribute to the objectives of the LDCF

Coordination with related initiatives

242. The project will build upon, and be closely coordinated with, **GEF/UNDP project 3616 "Establishing a Financially Sustainable National Protected Areas System"**, the objective of which is that by June 2014, Haiti will have put in place an integrated operational and financial framework to ensure long term sustainability of the national PA system. That project will develop capacities and mechanisms to increase and diversify funding for the NPAS, ensure that the best use is made of the resources available, and realize the potential of local communities to participate in PA management: it will also lead to an increase in the area of the national PA estate in order to improve economies of scale and to develop models of income generation, which will incidentally contribute to the ecosystem coverage of the NPAS.

243. The present project will overlap with project 3616 by around one year. By the time the project starts, project 3616 will have made significant progress in consolidating the bases for the functioning of the SNAP, including the operational establishment of the National Protected Areas Agency (ANAP) within the Direction of Protected Areas of the MDE (the ANAP will in due course become a semi-autonomous entity), the analysis and identification of strategies for financial sustainability and the negotiated development of models for PA planning.

244. The project will coordinate with and learn lessons from the **LDCF/GEF project 3733 “Strengthening Adaptive Capacities to Address Climate Change Threats on Sustainable Development Strategies for Coastal Communities in Haiti”**. That project operates in the south of Haiti but its area of influence does not directly overlap with that of the project proposed here (project 3733 extends westward from the town of Marigot, while this project will extent eastward from Marigot to Anse a Pitre). Project 3733 has generated lessons, or potential use to this project, regarding the strengthening of local governments and community-based organisations in relation to climate change resilience, and the raising of awareness among local populations regarding CCA, as well as tangible measures such as soil erosion control, gully stabilization and the protection of water sources.

245. In the Three Bays area, the project will be closely coordinated with **IDB project HA-L1076 (Productive Infrastructure Programme)**, which will provide the basic infrastructure, industrial facilities, management support and complementary investments required for the expansion and sustainable operation of the CIP. The IDB project will directly co-finance a number of the outputs of this project, including the development of alternative livelihoods, biological baseline surveys, capacity building and information dissemination, patrolling and natural resource management, and environmental education and awareness raising. The managers and technical operatives of the GEF and IDB projects will coordinate closely and regularly on practical and logistical issues, and will develop annual work plans jointly. During the PPG phase, common indicators and a shared monitoring system will be developed for the two projects.

246. In the south-west, the project will complement the GEF/LDCF/UNEP project **“Ecosystem Approach to Haiti’s Cote Sud”**, which is expected to be submitted for CEO Endorsement in early 2015. The UNEP project will offer a similarly integrated approach to CC resilience and coastal/marine BD conservation, but there will be no direct overlap (the two projects will coincide geographically in the Departments of Grande Anse and Nippes, but the UNEP project will focus there only on early warning and disaster preparedness, which is not directly addressed by this project).

247. Elsewhere in the country, the project will coordinate with other initiatives supported by GEF and/or executed by GEF agencies. These will include the following:

- The existing **LDCF/FAO full-sized project “Strengthening climate Resilience and Reducing Disaster Risk in Agriculture to Improve Food Security” (GEF ID 3733)**, approved in 2010, will generate important experiences and lessons on climate-resilient agricultural practices, which may be applied in the target watersheds of this project.
- The respective projects of UNEP and UNDP in the southwest of the country under Norwegian financing, which focus on environmental management, natural resource conservation and the reduction of climate-related vulnerability: the areas of these projects adjoin those of the project proposed here, opening opportunities for collaboration in promoting regional-level biological connectivity as well as addressing the land-based threats to coastal and marine ecosystems.
- The GEF/IDB project in support of Macaya National Park: this covers part of the catchment area of the Aquin and Baraderes target areas, and will therefore help to address land-based threats, most notably sediment-laden runoff affecting coral and other aquatic ecosystems.

- The GEF Small Grants Programme (SGP), implemented by UNDP: opportunities will be developed during the implementation phase for SGP to support the community-level alternative livelihood options proposed under Outputs 1.2 and 2.3, taking advantage of the significant experiences which it has generated to date with the strengthening of local stakeholder groups.

Design principles and strategic considerations

248. In recognition of high levels of social and biological interdependence between mountainous watersheds and the marine and coastal ecosystems into which they drain, and the crucial role which both terrestrial and coastal/marine ecosystems play in protecting local people against the impacts of climate change, this project will apply a “ridge-to-reef” approach to natural resource management in three priority areas of Haiti. This will generate synergies which will enable the simultaneous delivery of local benefits (in the form of reduced vulnerability to the effects of climatic change and variability, strengthened livelihoods, and increased and stabilized access to natural resources) and global benefits (in the form of improved conservation of globally important and threatened biodiversity, and enhanced biological connectivity at regional level).

249. The current project will deliver help to reduce the vulnerability of poor people in Haiti to the effects of climate change, while at the same time conserving threatened coastal and marine biodiversity. These benefits are highly interdependent: investments in climate-proofed BD conservation strategies will enable coastal and marine ecosystems to continue to generate Ecosystem-Based Adaptation (EBA) services; while additional investment of adaptation funds in the watersheds which drain into these ecosystems will serve to maximize BD benefits and ecosystem functions, as well as generating EBA benefits for the populations living in the watersheds themselves.

250. In the coastal and marine zone in particular, there is a pressing need to improve BD conservation through further strengthening of the PA system in this area; however this will be unsustainable in the long term if actions are not taken to address the threats to these areas posed by the poor management of the watersheds which drain into them, which are strongly determined by the effects of climate change (such as erosion, which is related to storm frequency and intensity, and deforestation, which is related to climate-related farming system collapse). Significant investments are underway in Haiti at present in support of watershed management, and furthermore GEF is investing in the strengthening of the National System of Protected Areas (SNAP); however these investments do not address the implications of climate change and may themselves be undermined by CC if adequate adaptation measures are not undertaken. It is therefore necessary to apply an integrated, ridge-to-reef approach which recognizes these relations between coastal and mountain areas, and between BD conservation and EBA. As well as delivering BD benefits, improvement of the protection of coastal ecosystems (both directly, through improved PA management and indirectly, through improved watershed management) will in turn safeguard their role as buffers against the impacts of climate change on people in the coastal zone (such as sea-level rise, wave impact and coastal erosion). Furthermore improvements in the management of the watersheds will generate on-site EBA benefits for the poor people living on the hills, by increasing the climate resilience of their farming systems.

251. The project will complement and build upon the advances of the existing UNDP/GEF project in support of the National Protected Areas System (SNAP), which is strengthening national level capacities for the management of the PA system, and has defined priorities for PA establishment throughout the country. This project will carry this further by supporting the implementation in practice of priority PAs in coastal and marine zones, in accordance with the recommendations of the SNAP project, and by expanding the conceptual focus of the SNAP to incorporate considerations of regional connectivity and of the biological and social interrelations between PAs and the landscapes which surround them. These are

innovative concepts in Haiti and are particularly important there given the high dependence of local people's livelihoods on continued access to and use of natural resources.

252. The project's strategic emphasis will recognize the significance of marine-based as well as land-based threats to coastal and marine ecosystems. Most significant of these is overfishing, which leads indirectly to the decline of coral reefs (and thereby their ecological and adaptation roles) by removing herbivorous fish, resulting in the uncontrolled growth of choking algae. Given the magnitude of this problem, the project will prioritise the reduction of fishery off-take levels, supported by the development of alternative livelihood options for fishers.

253. The required conditions are not considered to exist at present, in terms of resource knowledge or governance, to allow further active promotion of fishery activities (for example through the development of fisheries value chains, or the use of Fish Aggregation Devices) to be carried out in a sustainable manner, and indications are that the populations typically targeted by FADs are already in a precarious condition, which the increased promotion of such approaches would only worsen. Despite the attractiveness of the short-term economic and livelihood benefits attainable through such strategies, the risk of them further exacerbating the rate of decline of pelagic (and indirectly inshore) fisheries populations means that the project will not support the active promotion of fishery activities through market-chain development or FADs.

Project objective, outcomes and outputs/activities

254. *The objective* of the project is that watersheds and coastal areas in Haiti are spatially configured and managed to increase the resilience of ecosystems and vulnerable communities to climate change and anthropic threats.

255. Its main emphasis will be on promoting Ecosystem-Based Adaptation, through actions and capacities in support of the introduction of a "ridge to reef" approach to the management of key watersheds and their associated coastal zones, as relevant, in order to address upstream-downstream processes associated with natural resource degradation, resulting in multiple and interrelated benefits in terms of resilience to climate change, sustainable livelihoods and the protection of globally important biodiversity values.

256. The two components of the project will be closely interdependent. Improved management of watersheds under Component 1 will deliver direct EBA benefits to the poor farmers living there, by reducing the vulnerability of their farming systems to the impacts of climate change and vulnerability, while at the same time reducing the risk of CC-related impacts on populations living downstream, and also reducing impacts on the EBA functionality of coastal and marine ecosystems downstream. At the same time, direct investments in improved conservation of coastal and marine ecosystems, under Component 2, will further their capacity to buffer populations living in the coastal zone against the impacts of climate change.

257. This combined LDCF/BD STAR investment will complement the considerable baseline described above, furthering a landscape-wide, ecosystem-based approach to adaptation as a complement to the largely infrastructure-focused approach of most adaptation investments; and helping to realize the adaptation potential of PAs, investment in which has to date largely focused on site-specific BD considerations.

Component 1: Increased resilience to climate threats in key watersheds and coastal zones

LDCF funding: \$5,125,685

258. Actions under this component correspond directly with the three first priorities of the National Action Plan for Adaptation: 1) watershed management and soil conservation; 2) coastal zone management; and 3) valuation and conservation of natural resources.

Output 1.1 Governance framework—policies, plans and decision making for ecosystem-based adaptation (EBA):

259. Under the *baseline/business as usual scenario*, environmental policies, plans and decision-making will fail to take the implications of CC adequately into account, resulting in the risk that productive and/or infrastructural development initiatives will be located and designed in such a way that they degrade ecosystems which are of importance for EBA (for example by eliminating coastal mangroves, or generating sediment or other contaminants which affect the functioning of aquatic ecosystems), or that they are themselves at risk from the impacts of climate change (for example by being located in sites which are vulnerable to sea level rise, flash floods or erosion). The aim under the *EBA alternative* is that environmental decision-making (and the resulting policies and plans) will favour the perpetuation and/or restoration of ecosystems which contribute to EBA, striking an appropriate balance between the pressing short-term development needs of the local population, the reduction of their exposure to climate-related risk, and the generation of global environmental benefits.

a) Incorporation of EBA considerations into national plans and policies

260. The project will collaborate closely with the EU-funded Building Climate Change Adaptive Capacity project (APCCC) of the Ministry of Environment, in the incorporation of CC resilience considerations into national plans and policies, with the aim of generating a more integrated, detailed, updated and comprehensive planning framework than that which is currently provided for by the existing instruments such as the National Action Plan for Integrated Management of Watersheds and Coastal Areas (IMCAWA) or the national Strategic Development Plan which is currently under formulation. GEF support will complement that to be provided by the EU project by ensuring that the CC resilience concepts that will be mainstreamed will also include aspects of EBA, such as the importance of coastal and marine ecosystems in buffering CC impacts. To this end, the project's contribution will include the generation and supply of lessons learnt based on concrete experiences with the application of EBA approaches in the project's target areas. GEF support will also pay attention to reviewing legislative instruments related to extractive activities with negative implications on CC resilience, such as the trade in forest products affecting key watersheds.

b) Definition of arrangements for inter-institutional collaboration and responsibilities in relation to EBA

261. Again working through the project's Technical Working Group, project specialists will support the definition of arrangements for ensuring that the different sector institutions with responsibilities of relevance to the promotion of EBA coordinate their respective roles effectively. This will result in formal protocols for inter-institutional collaboration being agreed and adopted by each of the target institutions in the course of the project, with firm evidence of their application in practice by project end.

262. Of particular importance in this regard will be effective communication and coordination between the Ministry of Environment, on the one hand, and productive sector ministries (particularly the Ministries of Agriculture, Fisheries, Mines, Tourism and Planning and External Cooperation), in order to facilitate the harmonization of their respective sector development proposals with needs for climate change

adaptation and the protection of the EBA functions of key ecosystems. The analyses to be carried out in support of this output will consider how to make optimum use of existing coordination structures such as the National Environment Council (CONAE), in which different coordination and participation structures are represented, the Inter-ministerial Commission on the Environment (CIME), which is presided by the Prime Minister and involves the Ministers of Environment, of Public Works, Transport and Communication, and of Public Health and Population; and the Inter-Ministerial Committee on Territorial Land Use Planning (CIAT).

263. National buy-in and sustainability will be promoted through the involvement of the Inter-Institutional Working Group in discussions of the coordination mechanisms to be established.

Output indicator/targets:

- Formal protocols for inter-institutional collaboration adopted by target institutions
- Evidence of their application in practice by project end.

c) Strengthened capacities for negotiated and coordinated environmental decision-making in support of EBA at regional and local levels

i) Strengthened platforms for multi-stakeholder decision-making in relation to EBA

264. The project, in discussion with counterparts in the Ministry of Environment at central and regional levels, and representatives of departmental and municipal governments, will facilitate the operation of multi-stakeholder platforms at regional/local levels. These will be used for the analysis and discussion of priorities and plans or relevance to EBA in the target areas, with particular attention being paid to considering how to balance and reconcile objectives of EBA, sustainable development and poverty reduction. They will facilitate the implementation in practice of the arrangements for collaboration defined under Output 1.1b above, helping to allow their sustainability and evolution in the long term.

265. In order to promote sustainability and to avoid creating “participation fatigue” by expecting stakeholders to participate in new mechanisms, the project will make use of existing entities in this regard at departmental and local levels, identified during the PPG phase. These will include Departmental Technical Councils (a mechanism which is politically directed by the Departmental Delegate but technically directed by the Ministry of Planning). Attention will also be paid to optimizing broad-based representation in the platforms, including municipal authorities, civil society/non-governmental organisations and community-based organisations; their active participation in these platforms will help to ensure their buy-in to other aspects of the project. The incremental support that the project will provide to these platforms will focus on ensuring that EBA issues are firmly mainstreamed into their agendas.

Output indicator/targets:

- Existing platforms for environmental decision-making and coordination mainstream CC adaptation into their agendas in all three target complexes.

ii) Improved mechanisms for information flow to environmental decision-making processes

266. The project will furthermore support the improvement of mechanisms for information flow to environmental decision-making processes such as EIA, SEA and territorial land use planning. Taking advantage of the research capacities of national and international NGOs, it will help to identify information gaps and support applied research and inventory activities to fill them; and building on the information management capacities that have been established in the CNIGS with support from the European Union, it will provide technical support to ensure that the required information is channeled in a useful and accessible manner to decision-makers and to decision-support processes. Particular attention will be paid to including variables related to climate change resilience, biological connectivity, ecosystem function and environmental services. This improved information flow will allow information on spatial

priorities for the promotion of EBA, watershed management and biological connectivity to be integrated, permitting the optimization of the delivery of multiple environmental benefits.

267. This support will complement, and be closely coordinated with, the European Union APCCC project, which will support mechanisms for environmental decision-making including EIA and SEA. The direct support to EIA and SEA mechanisms that was foreseen in the PIF will no longer be necessary given that this will be directly addressed by the APCCC project; the project will however complement the APCCC project by supporting the flow and management of information and lessons learnt among regional and municipal governments in the target areas, in support of the incorporation by them of CC resilience considerations into their environmental decision-making and planning processes.

Output indicators:

- Improved information flow/management systems implemented
- National and regional maps of spatial priorities for EBA promotion
- Protocols in key target institutions requiring use of the prioritisation maps
- Evidence of prioritisation maps being used in decision making by project end

d) Territorial land use plans, taking into account spatial variations in CC vulnerability and EBA potential

268. The project will support local governments in the formulation of territorial land use plans: these will take into account considerations of the location and characteristics of ecosystems, watersheds, human populations and productive activities, as well as “hotspots” of vulnerability to the impacts of climate change, and the nature and magnitude of spatial dynamics between different parts of the area in question – for example current or potential downstream flows of sediments and pollutants into coastal ecosystems, or predicted spatial migration of ecosystems due to climate change. These plans will be of particular importance in areas which are potentially the targets of infrastructural or productive developments promoted by the Government, cooperation agencies and/or the private sector, in particular the more productive coastal plains: a key case in point is the Three Bays area, where the location of the industrial park has already been defined but there is a risk that much of the related infrastructure and urban development will emerge on an *ad hoc*, unplanned basis.

269. Strong emphasis will be placed on promoting national and local ownership of these processes. Cross-cutting principles and procedures will be formulated in discussion with the Interministerial Committee on Land Use Planning (CIAT), with additional bilateral and multilateral discussions with technical-level staff from the Ministries of Environment, Agriculture, Tourism and others. National academic and research institutions will be involved as much as possible, for example the Roi Henri Christophe University, in the conceptual development, testing and application of local planning instruments focused on CC adaptation. At local levels, the regional facilitators of the project will work closely with named counterparts in the offices of a selection of the Commune governments included within the target areas. Civil Society Organisations will also be involved as much as possible: these have the potential to complement Government actors, especially in terms of relations with local communities, and in the course of their involvement they will themselves be strengthened in order to enable them to continue to play this role in the long term.

Output indicator target(s):

- Territorial land use plans exist in all target communes, incorporating considerations of EBA and environmental sustainability

e) Plans for environmental management and investment in support of EBA

270. The project will furthermore seek to work with companies involved in economic development and infrastructure projects in the target areas, providing them with orientation on how to develop and

implement environmental management and mitigation plans, for example through the provision of specific information on climate risk and the locations of areas of high EBA value or vulnerability, and the range of management options that may be appropriate for the conditions identified; and for them to invest in mitigation measures and/or offsets.

271. This output will be of particular relevance to Complex 1 (The Three Bays), which has been identified by the Government as an important pole of future economic development and as such is likely to be subject to major investments in the future with potential implications for CC issues and biodiversity, particularly in the agricultural, industrial and residential sectors. The development of plans for environmental management and investment will be carried out in collaboration with the private investors themselves (working wherever possible with industry groupings such as chambers of commerce, in order to maximize momentum, impact and ownership), in discussion with local Governments and the relevant sector ministries (especially the Ministries of Environment, Agriculture and Tourism), and with support from the IADB as part of its investment in environmental management and mitigation in the Three Bays area (associated with its investment in the Caracol Industrial Park).

272. Subject to the results of more detailed studies that would need to be carried out on a case-by-case basis, technical options that might be included in such environmental management and investment plans might include, for example:

- Mangrove reforestation, and the setting aside of development-free buffer strips on the landward side of coastal mangrove areas, in order to provide for the landward migration of mangroves in response to rising sea levels. In the absence of such provisions, the retreat of the seaward margin of the mangroves due to sea level rise would result in their eventual disappearance and the loss of their role in buffering productive, residential and infrastructural investments against wave impacts. Such provisions would therefore be in the direct interests of the investors themselves.
- The reforestation of river banks (such as those of the Grande Riviere du Nord) in order to protect them from erosion during extreme rainfall events; again this would be in the interests of the investors themselves as it would help to protect their investments.
- The generation of alternative livelihood options for fishers in order to reduce pressures on coastal ecosystems, as an offset for the environmental impacts of the investors' productive activities.
- The implementation of best available technologies in terms of environmental impacts, such as the use of integrated pest management in agriculture, in order to reduce the levels of application of pesticides and the consequent impacts of their runoff into sensitive coastal ecosystems of importance for CC resilience and biodiversity.

273. Although project investments in support of this output will focus on the Three Bays area, similar plans may in the future be developed for the other two target complexes as and when proposals emerge there for development initiatives, and the project will therefore provide for the models developed and lessons learnt in the Three Bays regarding environmental planning and mitigation to be systematized, permitting their eventual replication in the other areas as and when needed. Mass tourism is one of the sectors which may require closest attention in this regard in the future, although no concrete initiatives of this type were on the table at the time of project formulation.

Output indicator target(s):

- Environmental management and mitigation plans incorporating BD/EBA considerations developed and implemented by end of project

Output 1.2: Conservation and effective management of ecosystems to enhance resilience and functionality

274. Under the *baseline/business as usual scenario*, the pressing needs of poor local people living in fragile watersheds to satisfy their food, energy and income requirements, their limited access to technical and financial support, and poorly developed conditions of environmental governance, will result in the continuation of natural resource management practices which degrade the ecological and productive functionality of steep land agroecosystems. This will exacerbate the risk of their productive failure under conditions of climate variability and change, and will increase risks of negative impacts downstream on human populations and on ecosystems of importance for EBA (for example through increased flashiness of stream flows, destructive flood pulses generated by landslides, reduced aquifer recharge and increased sediment and pollutant load in water courses).

275. Under the *EBA alternative*, as a result of the combined investment of LDCF and co-financing resources, farmers will have increased awareness of the relation between farming/natural resource management practices and their exposure to environmental risk, and increased capacities to apply EBA-compatible farming systems; while governance and organizational conditions will exist at local levels to support these systems and to sanction practices which undermine EBA.

a) Models for CC-resilient natural resource management practices developed and applied at site level

276. At site level, the project will support the development, application and institutionalization of models for natural resource management, which promote EBA and watershed management, and are feasible and attractive in social, economic and operational terms. In the context of Haiti, NRM models in support of EBA, watershed management and sustainable development will only be acceptable and sustainable if they generate benefits for local people in the short term, or at the very least generate no net negative impact on their livelihoods. The project will therefore invest in developing and promoting models of natural resource management and livelihood support that strengthen or diversify the socioeconomic situations of local people, as well as contributing to these goals.

277. The identification and implementation of these models of natural resource management and livelihood support will be achieved through highly participatory processes involving the members of local communities, in order to maximize the probability of their uptake, sustainability and compatibility with their overall livelihood support systems. National academic and research institutions (such as the Roi Henri Christophe University at Caracol, in the Three Bays Complex) will also be involved, for example in the systematization of traditional resilience and agrobiodiversity management practices): this will take advantage of their existing technical capacities and knowledge base, and will have benefits in terms of ownership and sustainability as it will provide opportunities for students, who may in the future join MDE, local governments or other key institutions of relevance to CC adaptation, to gain hands-on technical experience with the issue.

278. In order to optimize the use of the available funds, close attention will be paid to defining how each of the NRM models proposed under this component will contribute to CC resilience. While some of the CC resilience measures to be promoted under this LDCF component will also generate downstream BD benefits (for example by reducing the sedimentation of coastal and marine ecosystems), any measures that will exclusively or primarily contribute to BD conservation rather than CC resilience (such as the generation of alternative livelihood options to fishing) will be supported instead under component 2 (with GEFTF BD funding).

279. The options to be promoted will include soil conservation measures aimed at slowing cross-surface flow and trapping dislodged soil particles suspended in runoff water, which are already used in Haiti (see paragraphs 25 and 26 above) and will help to address the impacts on soils of CC-related increases in storm

events; they will go beyond these, however, and will include measures aimed at address other CC-related threats such as loss of soil water during drought events, and damage to crops by wind, either through desiccation or by physical breakage. The options to be promoted are summarised in Table 4 below.

Table 4. Examples of NRM/CC resilience options to be promoted in cropping systems (aspects that are likely to gain significance under conditions of climate change are marked *)

Practice	CC resilience benefits
Rock walls or dry walls (<i>murs secs</i>), consisting of terraces which are built along a contour and which are This is a common practice where rocks are easily available on the surface, but requires a significant amount of labor and time. On many mountain slopes rocks are abundant so the practice is common. A variant, known as <i>cordons de pierre</i> , is just a line of rocks running along a contour.	<ul style="list-style-type: none"> - If properly constructed and maintained, capable of checking cross-surface runoff of water and soil particles dislodged by rain* - Do not prevent erosion at the site of rainfall impact, or the direct effects of rain impact (e.g. soil surface crusting, which reduces permeability)*. - Can lead to the formation of terraces with improved rooting depth due to accumulation of trapped soil on their upper sides. - Slowing of runoff water can reduce its erosive effect downstream and permit some increase in local infiltration*. - Trapping of sediment reduces risk of sediment buildup altering river bed profiles downstream, which can increase flooding risk*. - High labour investment with no immediate and direct economic benefit.
Contour hedgerows: particularly appropriate for areas, such as those dominated by basaltic geology, where rocks are not easily available.	<ul style="list-style-type: none"> - As above (reduced speed of runoff*, soil trapping* and terrace formation), plus: - Potential to contribute to nutrient recycling and (in the case of legumes such as <i>Leucaena leucocephala</i> or <i>Acacia augustissima</i>) net inputs of nitrogen to the system - Contribution of organic matter to the soil (through leaf fall), which can increase the water retention capacity of the soil*. - Reduction of wind damage during storm events*, and wind-induced desiccation during drought periods*. - Potential to generate direct income through the inclusion of perennial and/or arborescent cash crops such as bananas, plantains, pineapples, vetiver or forage grasses, or fruit trees (“<i>banje manje</i>” systems), compensating labour investments.
Tree or grass windbreaks	<ul style="list-style-type: none"> - Reduction of wind damage during CC-related storm events* - Reduction of wind-induced desiccation of crops and soil*. - Recycling and inputs of nutrients and soil organic matter (as for contour hedgerows above) - Potential to generate direct income from timber, fruits and other NTFPs, or forage. - Depending on location, little positive benefit for soil erosion control* - Risk of negative shade impacts on crops and competition for water (depending on the rooting systems of the species used)
Dispersed trees in fields and pastures, developed from natural regeneration and subject to pruning and sometimes pollarding to minimize light	<ul style="list-style-type: none"> - As above (recycling and inputs of nutrients and soil organic matter*, reduction of wind damage and desiccation*, potential to generate direct income but risk of negative shade impacts) - Reduction of heat stress in livestock* - Little positive benefit for soil erosion control*

Practice	CC resilience benefits
competition with crops.	<ul style="list-style-type: none"> - If based on protection of natural regeneration, requires no investment in planting but does require avoidance of use of fire (so may increase crop weeding costs) - Risk of negative shade impacts on crops and competition for water (depending on the rooting systems of the species used)
No-till or minimum tillage agriculture	<ul style="list-style-type: none"> - Reduced exposure of soil to rainfall impact and erosion* - Improved conservation of soil moisture* - No negative impacts on short-term crop yields¹⁸
Mulch-based systems (leaving felled vegetation lying following clearance of fallows for planting)	<ul style="list-style-type: none"> - Conservation of soil humidity* - Avoidance of direct rain splash impact on the soil, avoiding surface crusting and dislodging of soil particles then washed away by runoff water* - Risk of negative shade impacts on crops, competition for water (depending on the rooting systems of the species used) and pest problems
Leguminous cover crops (mucuna, canavalia etc.)	<ul style="list-style-type: none"> - As for mulch-based systems*, plus inputs of soil nitrogen - Reduced weed populations - Generally more proven in higher rainfall areas. - No negative impacts on short-term crop yields¹⁹
Shade coffee	<ul style="list-style-type: none"> - Conservation of humidity in coffee plantations* - Protection of soil against rainfall impact and erosion and so reduces downstream sedimentation and flooding* - Recharge of soil water and aquifers via tree roots* - Income provides livelihood buffer against failure of other crops due to climate phenomena*
Water capture and recycling: rainfall capture from house rooves, and filters for grey waters from household activities used for drip irrigation of small vegetable gardens	<ul style="list-style-type: none"> - Enables farmers to bridge drought periods* - Potential for preferential benefits for women as it allows vegetable production close to the house to be combined with domestic activity - Especially relevant in areas with karst geology and so few natural water courses, e.g. Complex 2 (SW)
Use of climate- resistant crop varieties (starting with local investigation and exchanges of native varieties)	<ul style="list-style-type: none"> - Reduced vulnerability of crops to e.g. drought periods, spoilage in rain events close to harvest season, physical damage during wind events*

280. The effective and sustainable promotion of NRM models is highly resource-demanding. This aspect of the project will therefore be highly dependent on co-financing partnerships with other institutions and initiatives: these will cover most of the concrete costs of NRM promotion such as field technicians and the provision of financial and/or material support as appropriate; while LDCF funds will be used in a highly focused and incremental manner to ensure that the models promoted incorporate considerations of CC adaptation in an adequate and relevant manner.

¹⁸A study by Virginia Tech in 2012 in two sites in Haiti found no significant difference in maize yields between tillage and no tillage systems

¹⁹The study found no significant difference in 2012 yields between cover crops (three kinds) and no cover crops. On one site, 2013 maize yields were significantly better with Sesbania, sun hemp and Sorghum sedan cover crops than with no cover crop.

281. **Complex 1: The Three Bays.** The main resilience issues in this area are the susceptibility of hill farmers to soil erosion and to landslides under conditions of increasingly extreme rainfall events (these phenomena also expose settlements downstream to risks of flooding, including flash floods), and the failure of their rain fed crops due to increasingly unreliable rainfall patterns. Project efforts to address these issues will focus on the hill lands where the farmers with greatest vulnerability in these terms are mostly located, and in particular on the basin of the Grand Riviere du Nord river where the greatest part of the hill land (above 200m altitude) in the target area is located; these efforts will also spill over from the northern limit of the Grand Riviere du Nord basin to include the relatively limited areas of hill land in the upper reaches of the other basins that drain into the Three Bays themselves.

282. The principal partners of the project's LDCF investments in this area will be the US\$87 million USAID Avansé project, which commenced operations in 2013 and works in 6 drainage basins in the north coast, three of which drain into the Three Bays PA. It aims to improve agricultural productivity and incomes, focusing on five crops (beans, maize, cocoa, rice and bananas), through measures such as the use of fertilizers, pesticides and improved genetic material, as well as the development of value chains and productive infrastructure such as access roads. Without LDCF investment, it will include gully stabilization activities but not soil conservation in cropping areas, and its strategy for promoting climate change adaptation will rely principally on the introduction of climate-resilient crop varieties from the USA. In the "with-project scenario", LDCF funds will be used to complement these investments by supporting the introduction of production practices which promote on-farm CC resilience, such as agroforestry, the use of mulches and cover crops, and the use of local drought-resistant crop varieties (as an alternative to imported varieties); and on-farm soil conservation measures such as live barriers with the potential to reduce upstream-downstream impacts in the form of runoff and sediment load (generating downstream resilience benefits and incidental BD benefits in the form of reduced sediment impacts on marine ecosystems).

283. Similarly, the project will partner with the IFAD Small Scale Irrigation Schemes project (PPI2) project, on the incorporation of CC resilience into small scale irrigation initiatives, and the promotion of irrigated agriculture as a strategy for the diversification and CC resilience of livelihoods; and the World Bank funded project Strengthening of Agricultural Public Services Project II (RESEPAG II) project on the inclusion of CC-resilience considerations into agricultural extension support programmes.

284. **Complex 2: Baraderes/Cayemites.** Project actions in support of CC resilience in this area will similarly focus on reducing farmers' exposure to crop failure in the event of disruptions to rainfall patterns, and to soil erosion and landslides in the case of extreme rainfall events. Relatively greater emphasis will be placed here on the issue of drought-related crop failure, given the high porosity of the area's soils (associated with underlying karst geology), which means that they have limited water retention capacity. Levels of runoff, and consequent risks of erosion and flash floods, are correspondingly lower than in the other target areas, with the exception of the larger basins such as those that drain through the towns of Corail in the west and Baraderes in the east.

285. **Complex 3: Marigot – Anse a Pitre.** The project's actions in this area will focus principally on the following areas and production systems, which have particular significance in terms of the potential to generate CC adaptation benefits:

- The high altitude vegetable growing area on the *altiplano* of the Massif La Selle range (in association with Fondation Seguin and the World Food Programme), including the buffer zones of the La Visite and Foret des Pins NPs, which are particularly vulnerable to increased pressures from drought and erosion linked to climate change.

- The middle altitude coffee production area centred on the town of Thiotte (in association with GIZ): by supporting well-managed, structurally diverse shade coffee production systems (with a high tree content that helps to buffer against fluctuations in moisture regimes) the project has the potential to ensure that local people have access to a relatively CC-resilient livelihood support option, which also helps to protect watersheds against erosion (by ensuring almost complete ground cover) and landslides (through the root systems of their tree components).
- Lower and middle altitude annual cropping systems, which are susceptible to erosion, landslides and drought-related crop failure (in association with FAO).

Output indicator:

- EBA- and watershed- friendly practices being spontaneously applied by local farmers, incorporated into extension programmes of Government and/or CSOs, and accepted by producer organisations by project end

b) Community-based structures for planning and implementing EBA and watershed management

286. The resilience-friendly models for natural resource management will be supported at local level by community-based structures for planning and implementing EBA and watershed management, including strengthened village organizations capable of recognizing the magnitude and nature of environmental risks and mobilizing local and external resources accordingly, and strengthened local mechanisms for sanctions of NRM activities which undermine EBA and watershed management (such as the felling of mangroves or the pollution of water courses with agrochemicals). Wherever possible, the strengthening of local organizations will be coordinated with and build on the initiatives of NGOs and international cooperation projects and other existing initiatives.

287. The project will wherever possible build on existing local organizational frameworks in this regard, rather than establishing new entities. These will include the Commune authorities and, at a more local level, the Communal Section Assemblies (ASECs) present in each communal section. PPG studies also identified a total of 69 community-based organizations (CBOs) in the three target areas. The project will therefore work with both of these types of organisations, in order to i) spread its risks in recognition of the limitations of each (official entities such as commune governments and ASECs are typically under-resourced, while CBOs typically lack organizational consolidation, governance and technical capacity) and ii) take advantage of their complementary capacities and stakeholder bases (Government entities have more potential influence of formal regulatory and planning instruments, while CBOs have closer contact with grassroots constituencies and tend to be more specialized in relation to specific production sectors and issues).

288. The project will also build upon experiences generated to date with community-based environmental governance, and take advantage of relations that have been developed with CBOs, through externally-funded projects and Haitian Civil Society Organisations (CSOs) such as Fondation Seguin, The Audubon Society and the Foundation for Marine Biodiversity (FOPROBIM). Considerable such experience has been gained along the southern coast of the country through the “Cote Sud Initiative” and associated initiatives, implemented by UNDP and UNEP with financial support from GEF, the Government of Norway and IDB; this will be of direct utility for this project’s proposed activities in the Baraderes/Cayemites area, in collaboration between UNDP and UNEP. In the Three Bays area, the project will build upon past environmental governance initiatives such as *Kodinasyon Silveyans Be Karakol* or KSBK (Caracol Bay Oversight Coordination), which has principally focused to date on fisheries governance (and so will also be involved under Component 2, see below) but has the potential to act as a channel for EBA initiatives in the coastal zone, such as mangrove restoration and coral nurseries; it will

also directly involve FOPROBIM in the delivery of this output, building on that organisation's existing presence in the area and its experience in relation to environmental governance.

289. The local ownership and sustainability of this output will be promoted through the use, wherever possible, of existing community-based structures, rather than inventing new ones specific to the project; the use of fully participatory approaches to the analysis of needs, capacities and actions in this regard; and by directly involving existing CSOs such as FOPROBIM, Fondation Seguin and Audubon Society in order to consolidate their roles in support of local communities and as interlocutors between the communities and external actors.

Output indicator target(s):

- Community-based structures supporting EBA- and watershed-friendly NRM in pilot communities by project end

c) Strengthened organizations and norms for environmental governance at local level

290. The project will also work with local communities and municipal authorities in negotiating, developing and applying municipal and community-based norms for natural resource management and environmental controls (for example on agricultural practices, NTFP extraction and infrastructural development). These will be developed through participatory multi-stakeholder processes of analysis which will enable participants to characterize conflicts and threats related to natural resource management, which affect their resilience to climate change, such as the degradation of reefs due to unsustainable fishing or dredging, the loss of mangroves due to charcoal extraction, and the deforestation of open access areas of upper watersheds.

291. The project's approach to this output will be as described for Output 1.2b) above, with an emphasis on the systematization and consolidation of existing mechanisms and experiences, and full participation by local actors in the definition and application of norms. Again, it is intended to involve local Government entities (Commune governments and ASECs) and CBOs (such as KSBK in Caracol Bay) in a complementary manner in order to ensure that the norms have official support as well as grassroots buy-in.

Output indicator target(s):

- Community-based norms being applied in pilot communities by project end

Output 1.3 Assisted rehabilitation—to recover ecosystem functionality

292. Under the *baseline/business as usual scenario*, large areas of the target watersheds, which fall under open access/common property regimes, will suffer continued degradation of their ecological functionality and their ability to contribute to EBA, as a result of factors such as fire and the indiscriminate felling of trees for charcoal and construction. Given their tenure regimes, it will be outside of the capacity of individual farmers to improve the management of these areas. Under the *EBA alternative*, these areas will be returned to conditions of ecological functionality and sustainability: in the case of mangroves, sufficiently developed to be able to maintain their foothold in the face of wave impact and sea level rise; and in the case of forest vegetation in the upper parts of hills, with sufficient height growth and canopy closure to be able to withstand low-level wildfires, and with sufficient densities of mature trees to be able to regenerate effectively and compensate for ongoing extraction.

293. In recognition of the fact that the promotion of changes in natural resource management practices by local people may take some time to achieve significant coverage and impact, the project will accelerate EBA by investing directly in the complementary restoration and rehabilitation of degraded ecosystems. This direct investment of LDCF funds will only be used in cases where it is not realistic to expect local people to invest in the rehabilitation activities of their own accord, due to their limited capacities or

resources, and/or their limited perception of likely return on their investment (due either to the unproven nature of the benefits or the open access nature of the resource). More specifically, this support will be targeted specifically at areas of maximum vulnerability and in which there is maximum potential to generate EBA benefits, such as those areas of watersheds which are most at risk of erosion or slumping if action is not taken; areas in the vicinity of water courses, where there is potential to trap sediment in runoff before it is carried further downstream; and mangroves, with potential to buffer the effects of sea level rise and wave impacts.

294. The perpetuation of these restored ecosystems will be furthered by the community-based governance structures and norms which will be promoted under Output 1.2; the project will invest in raising awareness and capacities in these structures regarding the importance of protecting extant and restored ecosystems on open-access lands, due to their value for the provision of EBA and other ecosystem services.

295. The specific forms and locations of the assisted rehabilitation activities to be supported by the project will be confirmed in a participatory manner with local communities during the initial implementation phase, in order to maximize buy-in and the relevance of the activities to local needs and conditions. The different options of rehabilitation strategies that may be supported in this way (subject to this site-specific confirmation) are described in Box 6. Targets for different forms of rehabilitation are presented in Table 5. At this stage it is proposed to focus primarily on watershed reforestation (applying the models shown in Box 6), gully stabilisation and mangrove reforestation, as the most cost-effective of the options considered. Per area establishment costs for coral nurseries are very high expensive, and this option is therefore considered to have low cost-effectiveness, taking into account also that significant improvements in coral reef status are expected to be gained by reducing fishing pressures, even if rehabilitation is not carried out. Sea grass planting was also considered, but at this stage is not proposed due to its low cost-effectiveness and the fact that sea grass beds are at present in a relatively stable condition compared to the other priority ecosystems. The targets for mangrove reforestation are relatively small, but as they will be focused on reinforcing the seaward edge of existing mangrove areas they will benefit a significant length of coastline (assuming reforestation will be focused on a 10m wide strip along the seaward edge, each hectare of reforestation will cover 1km of coastline).

Box 6. Options for assisted rehabilitation

1. *Mangrove restoration*

Although mangroves cannot halt SLR, they can counter the threat of wave damage to coastal ecosystems and infrastructure resulting from CC-related sea level rise and increased storm activity, and also contribute to trapping sediment draining into coastal areas as a result of poor watershed management exacerbated by climate change, which would otherwise contribute to the choking and mortality of reefs and consequent loss of their coastal buffering functions. UNEP-WCMC (2000)²⁰ shows that 70 – 90% of the energy of wind-generated waves may be absorbed by mangroves and reefs, but that the buffering capacity depends on ecosystem integrity and physical characteristics. There are close interrelations of dependency between coastal mangroves, coral reefs and seagrass beds: together, these form highly diverse and structurally complex ecosystems in which the reefs act as a barrier that shelters seagrass beds and mangroves from high wave energy; these in turn provide foraging and nursery habitats for many larval and juveniles of reef species.

The most effective species for protecting coastlines, especially at the exposed conditions of the seaward

²⁰ UNEP-WCMC (2006). *In the Front Line: Shoreline Protection and other Ecosystem Services from Mangroves and Coral Reefs*. UNEP-WCMC, Cambridge, UK, 33pp.

edge, is the red mangrove (*Rhizophora mangle*); establishment of this species along the coastal fringe will be complemented by the protection and restoration of other species and ecosystems further back, including black mangroves (*Avicennia germinans*). The project will rely on a combination of natural regeneration and artificial regeneration (planting) to achieve the recovery of structure, function and EBA services in mangroves and other associated coastal ecosystems. Natural regeneration will be the preferred option wherever possible, as it is significantly cheaper than planting. Natural regeneration is most viable in clearings in the middle of mangrove areas, where there is an abundant natural supply of propagules (“seed rain”) and favourable light, edaphic and hydrological conditions. These conditions are less favourable, and natural regeneration therefore less feasible, in sites which have undergone major transformation from natural conditions, and where repeated human pressures have led to loss of the seaward belt of red mangroves and consequent retreat of the coastline, scarcity of seed trees, absence of favourable substrate and exposure to damaging waves which do not allow natural regeneration to gain a foothold. Under such conditions, artificial regeneration will be used, through the direct sowing of propagules collected from existing local stands.

2. Reforestation

The project will support diverse forms of active reforestation, with the aim of helping the development of tree-rich landscape mosaics, capable of contributing to the improvement of overall ecological function at landscape level (e.g. reduced windspeeds, habitat niches, soil humidity conservation, nutrient cycling and the establishment of foci for the natural dispersion of tree seed across land units), and thereby enhancing the potential for EBA functions. These initiatives will include, for example, the establishment of small community-managed woodlots, enrichment planting of existing forests, windbreaks, the rehabilitation of shade coffee and shade cocoa plantations, and the enrichment of soil conservation structures with fruit trees.

3. Gully control

Practices for gully control have been extensively tested and proven worldwide, and in Haiti itself, and detailed field manuals are available on the practicalities²¹:

In gully control, temporary physical structural measures such as gully reshaping, brushwood, sandbag, loose stone, gabion and arc-weir check-dams are used to dissipate the energy of runoff and to keep the stability of the gully. Check-dams are constructed across the gully bed to stop channel/bed erosion. By reducing the original gradient of the gully channel, check-dams diminish the velocity of water flow of runoff and the erosive power of runoff. Run-off during peak flow is conveyed safely by check-dams. Temporary check-dams, which have a life-span of three to eight years, collect and hold soil and moisture in the bottom of the gully. To give vegetation an opportunity to establish, runoff control structures may be needed in the gully. The structures can be either temporary or permanent. The choice of the measures and extent of their use will depend on the amount of the runoff and the status of the gully whether young and actively eroding or mature and establishing naturally.

The use of vegetative material in gully control offers an inexpensive and permanent protection. Vegetation will protect the gully floor and banks from scouring. Grasses on the gully floor slows down the velocity of the runoff and causes deposition of silt. It can also be of economic value to the land users. Vegetation can be established in a gully by natural recovery or use of planting materials. A gully will re-vegetate naturally if the water causing erosion is conserved or diverted before it reaches the gully and if livestock are kept away. Costs are minimal but recovery will be slow if the soil is poor. Furthermore, if

²¹ Nile Basin Initiative Eastern Nile Subsidiary Action Program (ENSAP), Eastern Nile Technical Regional Office (ENTRO), Eastern Nile Watershed Management Project: A Field Guide on Gully Prevention and Control (http://www.bebuffered.com/downloads/ManualonGullyTreatment_TOTFinal_ENTRO_TBIWRDP.pdf)

the gully sides are steep, vegetation may not establish itself. Where establishment of natural vegetation is too slow to cope with the erosion or where a particular species is desired, planting should be done. The establishment of vegetation either naturally or artificially has to contend with a hostile environment. The type of planting material to be used should be seriously considered based on the specific situation of the gully. Conservationists and farmers should properly assess the soil and moisture conditions in the gully head, gully floor/bed, gully sidewall and gully offset/gully buffer zone.

4. Coral nurseries

The regeneration of branching corals such as *Acropora* can be facilitated through the transplantation of coral fragments, normally onto artificial structures such as submerged metal frames. This offers significant advantages over relying on natural regeneration, which is limited by low natural recruitment rates, limited spatial dispersal of gametes, high mortality, slow growth rates and the unconsolidated nature of available substrates (especially in storm damaged areas) that inhibits successful recruitment of corals²².

The “coral gardening” methodology, in which coral colonies or fragments are grown in underwater nurseries and then transplanted back onto degraded reefs, has been applied successfully at various scales. In Florida and the Caribbean, coral nurseries have been designed to maximize *Acropora* survivorship and productivity while minimizing negative impacts on existing wild populations. The use of nurseries for *Acropora* propagation is increasing rapidly, and this approach is now being used in many countries in the Caribbean. By utilizing the natural process of asexual reproduction through fragmentation, nurseries provide a sustainable source of *Acropora* corals to be used for population enhancement²³ (for cost reasons, artificial transplantation is not a practical means of directly regenerating large areas of degraded reef, but through the strategic location of nurseries it can be used to generate larvae and thereby facilitate natural processes of regeneration). Nursery-based coral gardening also provides a vehicle for raising awareness of local communities, visitors and policy makers about the importance and fate of corals and reef ecosystems.

Table 5. Targets for rehabilitation

	Complex 1: NW	Complex 2: SW	Complex 3: SE	Total	Unit Cost (\$)	Total cost (\$)
Mangrove restoration (ha) ²⁴	3.5	3	0.5	7	15,000	105,000
Gully stabilisation (km)	4	2	4	10	35,000	350,000
Reforestation (ha)	750	500	750	2000	800	1,600,000
Total cost:						2,055,000

296. Unlike the other outputs of the project, this output will focus on direct investment in rehabilitation, rather than the development of sustained capacities among institutions or local stakeholders for continuing the actions in the long term. Its success is, however, dependent on the rehabilitation impacts themselves being sustained, as measured, for example, by the long-term survival of the trees planted in the mangroves and the upper watersheds. This will be achieved, on the one hand, by ensuring that the processes of selecting and applying the technologies to be used receives adequate technical support from project-funded technicians, and are also subject to local validation with local people; and, on the other, by

²²Keryea Soong and Tai-an Chen Coral Transplantation (2003): Regeneration and Growth of *Acropora* Fragments in a Nursery. Restoration Ecology Vol. 11 No. 1, pp. 1–10.

<http://www.mbi.nsysu.edu.tw/keryea/Coral%20fragment-Res.%20Ecol.pdf>

²³Johnson, M. E., C. Lustic, E. Bartels, I. B. Baums, D. S. Gilliam, L. Larson, D. Lirman, M. W. Miller, K. Nedimyer, S. Schopmeyer. 2011. Caribbean *Acropora* Restoration Guide: Best Practices for Propagation and Population Enhancement. The Nature Conservancy, Arlington, VA. http://frp.org/FRRP%20documents/Coral_Guide_111811_r1.pdf

²⁴1ha reforested will benefit 1km of coastline.

developing the conditions of community-based environmental awareness and governance (particularly under Output 1.3c) required for the plants be protected, after establishment, against threats such as felling and burning.

Component 2. Strengthening of the contribution of protected areas to biodiversity conservation and sustainable development in the MCZ

GEFTF funding: \$3,574,380

297. The project will focus on the establishment and strengthening of Managed Marine Areas (MMAs) rather than conventional protected areas (PAs). This term (*sensu* Orbach and Kerrer 2010²⁵) better reflects the objective of allowing the managed use of natural resources, rather than only their protection from use.

Output 2.1 Refined proposals for the PA estate in the MCZ.

298. The GEF SNAP project has developed proposals of priority locations for PAs in both terrestrial and coastal/marine areas: this project will help to put those proposals into practice in a limited number of high priority sites. At this stage, the proposals are indicative and reflect initial studies and discussions carried out during the PPG phase, rather than the full consultations that would be required to ensure their full acceptance and ownership by local people. Further refinement and confirmation of these proposals will be carried out through detailed participatory processes with local stakeholders, in particular the members of local communities, as explained in the attached Environmental and Social Screening Protocol (ESSP). These processes will be used to discuss the nature of their interactions with, and dependence on, the resource, and the consequent nature and magnitude of any implications that MMA establishment might have for their livelihoods, together with the discussion of resource management and livelihood alternatives with potential for “win-win” or mitigating social impacts.

a) Declaration of Managed Marine Areas (MMAs) in all three target complexes

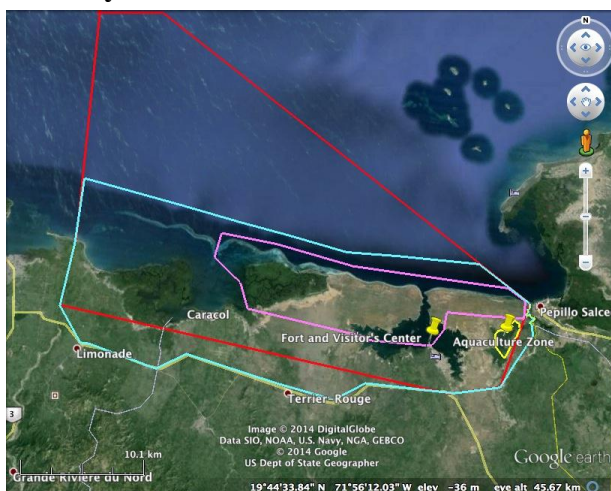
299. Subject to the results of more detailed participatory processes and studies during the implementation phase of the project, it is proposed that the project will provide support leading to the declaration of MMAs in the three target complexes, as set out below. This support will include the realisation of studies of the biological values in the target areas and the existing social uses of their natural resources, leading to the generation of initial proposals for PA locations and management categories; this will be accompanied by consultations with local stakeholders, leading to proposals that are both technically sound and socially acceptable; and finally the drafting and eventual declaration of the MMAs.

300. In **Complex 1**, the Three Bays National Park (PN3B²⁶) was declared in March 2014, covering the most important coastal and marine ecosystems of this part of the country. Project efforts here in relation to this sub-output will concentrate on establishing an MMA as an internal management zone within the boundaries of the PN3B as a whole. It is suggested that this MMA would cover the whole of the terrestrial portion of the PN3B, as well as the marine portion approximately as far as the 200m depth contour, in order to include the most important areas for inshore fisheries. Other sub-zones for management within the MMA as a whole are suggested under sub-output 2.1b below.

²⁵ Orbach M, Kerrer L. 2010. Marine Managed Areas: What, Why, and Where. Science and Knowledge Division, Conservation International, Arlington, Virginia, USA.

²⁶ Parc National les 3 Baies

Figure 3. Suggested limits of MMA in the NE Project Area (blue line). The red line is the boundary of the existing Three Bays National Park.



301. In **Complex 2**, the UNEP/REGATTA regional project is (at the time of finalizing the ProDoc) carrying out studies to identify key areas for biodiversity conservation, on the basis of which the NORAD-funded UNEP project “Macaya Grand Sud” will generate indicative proposals of priority locations for protected areas in this zone. This is expected to be completed by mid-2015.

302. In the interim, it is provisionally suggested that the limits of this MMA would coincide approximately with those of the Key Biodiversity Area that was defined in this area in 2011²⁷, but, reflecting the results of additional surveys carried subsequently in the area²⁸, it would extend rather farther to the east to include the coral reefs to the east of the town of Petit Trou de Nippes. This provisionally suggested MMA boundary would include 515 km² of land and sea area. It is indicatively proposed that its terrestrial portion would extend inland around 2km, and it would extend seaward as far as the 200m depth contour.

Figure 4. Suggested limits of MMA in the SW Project Area



303. In **Complex 3**, it is indicatively suggested to establish two MMAs, to the west and east respectively of the town of Grand Gosier, the landward boundaries of which would again run parallel to the coast, 2km

²⁷ Timyan, JC (2011) Key Biodiversity Areas of Haiti. SAH/CEPF. 48 pp.

²⁸ Reefcheck, 2011

inland, and the seaward boundary would again follow the 200m depth contour. The easternmost of these suggested MMAs would be linked to the recently declared community-managed dry forest PA located to the west of the town of Anse a Pitre.

Output indicator target(s):

- MMAs formally declared by project end

b) Internal zoning of PAs

304. Each of the suggested MMAs will be internally zoned in such a way as to permit their sustainable use and conservation in accordance with the overall precepts of the MMA model (see paragraph 297 above), and in reflection of the internal heterogeneity of social, productive and biological conditions in each of the areas. As with the external limits of the MMAs, the boundaries and management approaches of their internal zones will be defined during the implementation phase of the project, on the basis of more detailed technical studies and stakeholder consultations than were possible during the PPG phase.

305. Subject to confirmation in this way, the following zones are suggested in the target complexes:

Complex 1 (Three Bays MMA):

- 1) **Tourism Development Zone** (pink line in Figure 3): this could occupy around one third of the area of the MMA, including the two larger forts in Fort Liberté Bay (an ideal location for a visitor centre), and extending to Caracol Bay in the west to take in reefs and mangroves, which could be used for tours, research and education.
- 2) **Aquaculture Zone:** this would provide alternative livelihood options for a significant number of those currently involved in fishing, thereby helping to reduce pressures on wild fish resources (see Output XX below). The ideal location for this would be the Lagoon aux Boeufs near the border with the Dominican Republic: exotic *Tilapia* fish have previously been introduced to this brackish lagoon, and it is therefore probable that few native or endemic species of fish or invertebrates still remain (although surveys would be carried out during the implementation phase of the project to fully confirm the suitability of the area). Much of this location would be suitable for cage culture of *Tilapia* fish, and a section of the eastern shoreline of the lake could be used for pond culture as well.
- 3) **Multi-Use Recreation Zone:** this area would include the beaches, coral reefs and channel of Fort Liberté, which can be used for swimming, snorkeling, scuba diving, and kayaking. It would extend west to include a portion of the Caracol Bay mangrove forest because there are channels passing through the mangroves that would be an attraction for snorkelers, kayakers and stand-up paddle boarders.
- 4) **Fisheries Recovery Zone:** this suggested area would be subject to specific regulations on fishing activity, in order to allow fish to grow to maturity and reproduce. It is suggested that it would include around 30% of the coral reef in the MMA. A spillover effect should enhance the fisheries outside of this area within a few years. It is also proposed to establish a coral garden inside this area, in the entry channel to Limonade Bay: water quality should be sufficient there due to good circulation but protected from waves to set up a grow-out facility for the endangered species of coral found on the reef including the two branching corals, elkhorn and staghorn, and the head forming corals, *Montastraea* spp.
- 5) **Mangrove Conservation Zone:** this area, suggested for the large mangrove area located to the east of Caracol Bay, could be used for educational tours (subject to investment in a boardwalk and signage). It overlaps with the Multi-use Recreation Zone because some visitors may take boat tours, or use kayak or stand-up paddle boards to travel through the narrow channels.

Figure 5. Suggested limits of multi-use recreation zone in NE MMA



Figure 6. Suggested location of Fisheries Recovery Zone and Coral Garden in NE MMA



Figure 7. Suggested location of Mangrove Conservation Zone in NE MMA



Complex 2 (Baraderes/Cayemites)

306. It is suggested that Tourism Development Zones be defined within the MMA (blue line in Figure 4), covering the coast of Petit Trou de Nippes, Grand Boucan, Baraderes Peninsula, the “Blue Lagoon” (at the western end of Baraderes Bay), the bays east of Pestel and the beach areas in between Cayamites and Petite Cayamites. Potential hotel locations would include the cliffs east of Petit Trou de Nippes, northeast of Grand Boucan, SE and SW Cayamites and Petite Cayamites. The reefs in front of Petit Trou de Nippes and extending towards Grand Boucan are some of the best in Haiti for snorkeling and scuba diving, as is the Blue Lagoon.

307. As in Complex 1, it is suggested also to define Aquaculture Development Zones in this area, including both fish ponds on land and protected sea areas for Fish Cages, one each for Petit Trou de Nippes, Pestel and Corail.

308. It is also indicatively proposed (subject to local consultation) that Fishery Recovery Zones be established in key locations (see Figure 8), covering around 30% of the live coral reef, near Petit Trou de Nippes, the Blue Lagoon in Baraderes Bay, and the outer reef west of Cayamites.

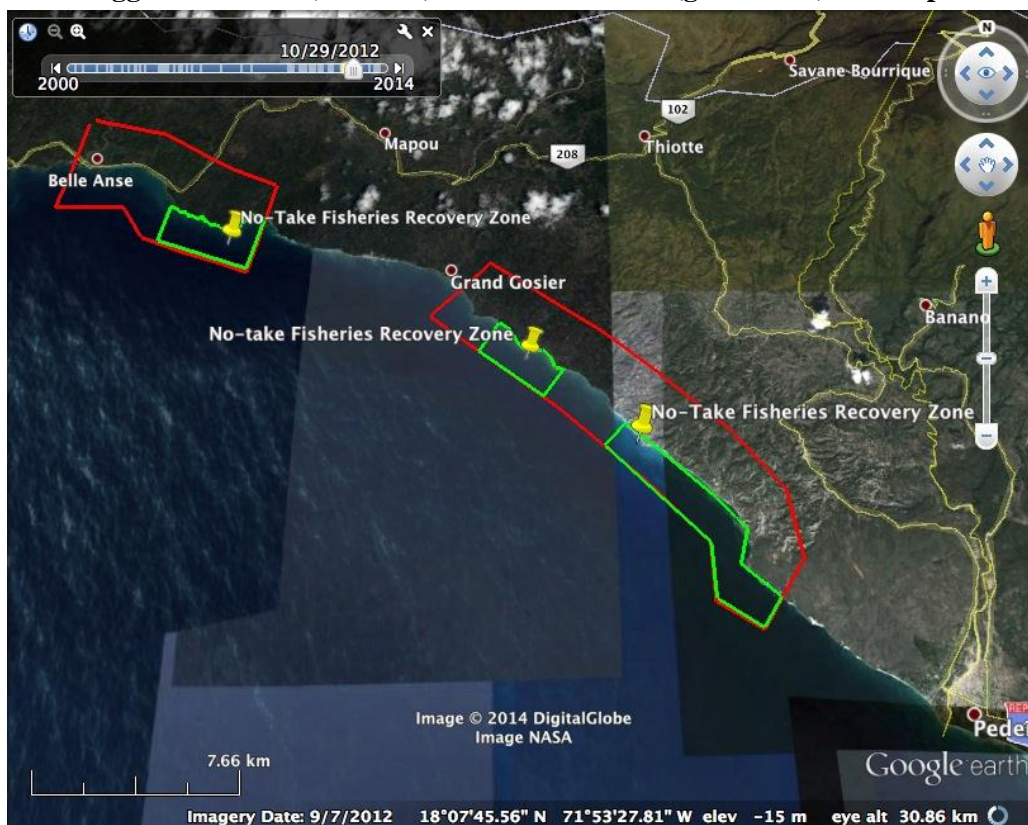
Figure 8. Suggested No-Take Fisheries Recovery Zones in Complex 2



Complex 3 (Belle Anse-Anse Pitre MMAs)

309. The suggested Belle Anse and Grand Grosier – Anse Pitre MMAs are shown in Figure 9 along with three proposed No-take Fisheries Recovery Zones. The MMAs cover a total area of 10,504 ha. The Belle Anse Fisheries Recovery Zone covers 792 ha, Grand Gosier 485 ha while the Anse a Pitre Fisheries Recovery Zone covers 1021 ha for a total of 2298 ha of No-take Area. Due to the narrow coastal shelf, the zones are narrow. The coastal area is quite arid most of the year. There is a series of four very small lagoons (<200 m wide) on the peninsula 4 km east of Belle Anse. One is of tourism value as a small swimming area with reef in front. The small lagoon to the west has the only mangrove stand along this coast line and the water is brown with tannin. The two smaller lagoons have been converted to salt ponds and could be used for fish ponds. Once more information is available a tourism development zone could be established in Belle Anse covering the beach front and the small lagoon. In addition, about 2 km of red rocks and white pebble beaches along the coast to the west of Anse Pitre should also be placed in a Tourism Area.

Figure 9. Suggested MMAs (red lines) and no-take zones (green lines) in Complex 3



310. This area is adjacent to the Jaragua National Park, immediately over the border in the Dominican Republic, which is one of the largest PAs in the Caribbean, with an area of 1374 km² (905 km² of which are marine). The park is represented by the dry forests ecoregion and includes dry forest, mangroves and scrub habitat. By linking the two contiguous stretches of coastline and upland areas, this would create a significant section of coastline that is under management and could potentially benefit local people. The fisheries situation at the border has been studied in some detail from a socioeconomic perspective and a long list of problems was identified.²⁹ The one area of agreement between fishermen's groups on both sides of the border is that the reef fisheries are overfished. By establishing an MMA to include a No-take Fisheries Recovery Zone on the Haiti side, it might be possible to convince the DR to do the same on their side. The NGO Reef Check has successfully co-managed La Caleta MPA near Santo Domingo with the DR government resulting in higher incomes for fishermen through tourism (diving, kayaking etc). The fish returned to La Caleta within two years, and the algae were consumed. This could be replicated at Jaragua if the fishermen agree to try a closure.

311. While most reports of whale sightings are on the north coast, some have been observed on the south coast of Haiti during the winter months. If whales are regularly observed in this area, it might be a possible tourist attraction and alternative livelihood for fishermen as it is in Samana, DR. Turtles are regularly observed and caught by fishermen in nets in the SE area. If sufficient turtles are using the

²⁹ Pesackas, Ryan. 2008. Dividing the Waters Resource Use, Ethnic Relations, and Community-Based Management among Fishermen on the Southern Haitian-Dominican Border. Masters Thesis. Anthropology Dept. University of Florida, Gainesville. 145 pp.

beaches as nesting areas, then this could also be a tourist attraction as well as a biodiversity resource. An egg collecting and hatchery program could be helpful both from a tourism point of view and for biodiversity conservation of these species.

Output indicator target(s):

- Internal management zones defined and regulated over the entire area of the proposed MMAs by project end.

c) Detailed studies of environmental and social baselines

312. These studies, in each of the proposed areas, will include the identity and ecological requirements of key elements of biodiversity and other objects of conservation; the types, magnitudes and implications of interactions between local people's livelihoods and the natural resources of the areas; the corresponding definition of human-induced threats to their environmental values and the possible implications for local people of PA establishment and the introduction of livelihood alternatives; and the nature and magnitude of the likely impacts of climate change.

313. GEF resources in support of this output will mostly be invested in Complex 3 (Marigot – Massif La Selle – Anse à Pitre). In Complex 1, the ecological and socio-economic baseline studies for the Three Bays National Park will have been largely or wholly completed by the time the project starts, with funding from IDB, and The Nature Conservancy will have carried out a highly complementary benthic mapping project supported by private funding; and in Complex 2 (Baraderes – Cayemites) studies required to support MPA establishment and management will be included in Phase II of the Macaya – Cote Sud project funded by the Government of Norway.

Output indicator target(s):

- Environmental and social baseline studies carried out in all proposed PAs by project mid-term.

Output 2.2 Strengthened instruments and capacities for the effective management of PAs.

314. In general terms, the management goal of the MMAs will be to conserve the biological diversity and productivity (including ecological life support systems) of coastal and marine ecosystems. Both aspects of the goal are equally important for restoring and maintaining ecosystem health. For example, conserving an area of relatively low diversity but high productivity, such as a sea grass bed, may be essential to maintaining viable populations of threatened species, such as the manatee and may also provide invaluable ecosystem services such as serving as a carbon sink. In terms of contributing to human welfare, maintaining biological productivity is essential. Correspondingly, the MMAs will depend on the support of local communities for survival and such support may well depend on recognition of the contribution which the MMA makes to human welfare through maintaining biological productivity.

315. There are several overarching principles under which the MMAs will be developed:

- All human uses and their subsequent impacts on the defined area should be considered and their management integrated.
- Policy and management should be based on the best natural and social science available.
- All stakeholders in the defined area should be consulted and fully involved in the policy and management development and implementation processes concerning the MMA's conditions and uses. When such principles are fully implemented, the uses of the resources and habitats and the resulting benefits both to the environment and to humans can be optimized.

316. The primary objectives of the user zones are to ensure sustainable use of the natural resources, to ensure the safety of users and compliance with applicable laws and regulations within the MMA. Some possible objectives for the target MMAs are shown in Box 7:

Box 7. Indicative objectives for the target MMAs

The primary objectives of the user zones are to ensure sustainable use of the natural resources, to ensure the safety of users and compliance with applicable laws and regulations within the MPA/MMA. Some possible objectives for Haiti MMAs include:

Socioeconomic/Educational

- Improve fisheries outside the MMA no-take areas,
- Provide an educational experience for all visitors that highlights the biological, historical and cultural resources of the MMA,
- Provide ocean education experiences for local and visiting school children including swimming, snorkeling, boating, scuba diving,
- Preserve and display historical and cultural resources from the colonial and pre-colonial (taino) eras,
- Provide mechanisms, including training and microcredit for local residents to create small businesses that use the biological, historical and cultural resources of the MMA in non-extractive ways to increase family income,
- Reduce reliance on fishing income by providing alternative livelihoods through direct employment in the MMA and related support businesses such as hotel, curio sales, kayak, snorkel and scuba tours of mangroves and reefs;
- Increase employment through job training and microcredit to support small businesses compatible with the MMA such as aquaculture, boutique coffee, chocolate, tequila, etc.

Biological

- Create no-take zones where fish and shellfish can reproduce and grow to maturity,
- Implement and enforce fisheries regulations inside and outside no-take areas,
- Protect spawning areas and nursery grounds,
- Reduce damage to important habitats (seagrass, mangroves, coral reefs),
- Provide refuge for key and protected species, such as turtles, endangered species such as the staghorn and elkhorn corals (*Acropora cervicornis* and *A. palmata*)
- Reintroduce and propagate species that have been extirpated locally such as staghorn and elkhorn coral, Nassau grouper, crocodiles and manatees
- Increase the number of species and abundance of key species, which helps the food web as a whole
- Increase the abundance and size of fish and shellfish inside and outside of the MMA.
- Increase resilience of the ecosystem to threats such as coral bleaching, climate change, sedimentation and water pollution
- Reduce external threats to the MMA from upland erosion, sedimentation and nutrification,
- Increase sustainable use of the MMA resources
- Improve ecosystem-based services to help prevent damage from sea level rise.

317. In the Three Bays National Park, this output will be significantly co-financed by the USAID-funded Caribbean Marine Biodiversity Activity (CMBA), executed by The Nature Conservancy (TNC). This co-financing will focus on aspects including financial sustainability, planning and governance of the fisheries sector in order to reduce its environmental impacts, strengthening of local organizations and awareness, and increasing coverage and support for fish sanctuaries.

a) Definitions of management provisions and corresponding management instruments

318. The project will support the proposal and negotiation of specific management provisions for the MMAs in each of the target areas, and their translation into management plans, incorporating considerations of marine biology, biological connectivity at local and regional levels, the condition and sustainability of populations of species of socioeconomic importance, the nature and magnitude of threats, the needs and conditions of local communities, and the existence of alternative strategies for conservation and for sustainable economic activity which would allow PAs to be compatible with local people's livelihood needs. The plans will also including provisions for the participation of local stakeholders in their management. They will complement and be integrated with the proposals for financial sustainability that will be generated by the GEF SNAP project.

319. Specific management instruments to be developed with project support will include the following:

- "Master plans" setting out the overall objectives of each MMA, together with generalized proposals for its management and administrative structures, its strategies and mechanisms for relations with local stakeholders, its internal zoning, its monitoring and evaluation systems and its strategies for financial sustainability. Master plans will normally have a medium-term duration (5-10 years) and be subject to review, updating and renewal after that period.
- Financial sustainability strategy, setting out cost projections and specific proposals of approaches for revenue gathering and financial management.
- Stakeholder participation strategy and plan, detailing the specific mechanisms proposed for optimizing stakeholder participation and its inputs into adaptive management of the MMA, and making specific provision for gender issues.
- Human resource development strategy, defining the staffing needs of the MMA (in terms of quantities and capacities) and proposing specific actions aimed at satisfying these needs (e.g. capacity development, increased contributions from central and local Governments, involvement of civil society organisations and local communities).
- Environmental education plan.
- Monitoring and evaluation plan, including indicators of social and biological parameters and a costed plan for their measurement and the input of the results into adaptive management of the MMA.
- Annual plans of operations for MMA managers.

Output indicator target(s):

- Full range of management instruments developed for the target MMAs by project end.

b) Programme for training and strengthening local organizations

320. The development of management instruments will be complemented by the development of human and organizational capacities among key stakeholders operating in each of the target PAs (including Government institutions, NGOs and/or community groups). Studies have shown that conservation behaviour in Haiti can be improved by providing villagers information about benefits from the natural resources in question, increasing annual income, improving education, strengthening organizational memberships, and increasing women's involvement. Conservation behavior is greatly influenced by organizational, structural, and environmental characteristics of the villages³⁰.

321. Specific thematic areas on which this capacity building will focus will include:

- Monitoring of BD status, the nature and levels of threats, and MMA management effectiveness;

³⁰ Dolisca, Frito, McDaniel, Joshua M., Shannon, Dennis A. and Jolly, Curtis M.(2009)'A Multilevel Analysis of the Determinants of Forest Conservation Behavior Among Farmers in Haiti',Society & Natural Resources,22:5,433 — 447

- Issues of conservation biology of relevance for the development of effective conservation strategies, such as biological connectivity and regional biological processes;
- Management options for reconciling conservation and livelihood support needs;
- MMA management planning,
- MMA financial planning.

322. The IADB, working with the Ministries of Environment and Finance, will co-finance capacity building and information dissemination relating to the management of the PN3B, patrolling and natural resource management, the development of sustainable alternative livelihoods for its inhabitants (such as alternative charcoal sources, pelagic fisheries, mangrove fisheries, and sea salt production), and environmental education and awareness raising.

c) Institutional strengthening programme at national level

323. The experiences generated at local level in the target sites with the development and implementation of management instruments, and the strengthening of institutional capacities, will be systematized and used as the basis for a programme aimed at strengthening the capacities of national **institutions for** the planning and management of coastal and marine PAs. This programme will be aimed at the staff of Government institutions such as MDE and MARNDR, and national NGOs as appropriate. Activities within the programme will include training courses and workshops, focused on challenges and options related specifically to the coastal and marine zone, and the development of manuals and protocols for planning, management and administrative procedures in marine and coastal PAs. The programme will be closely harmonized and integrated with the institutional strengthening activities of the current SNAP project, providing a “value-added” on top of these in terms of the specific attention to marine and coastal issues.

d) Financial mechanisms to support PA management

324. The project will support the implementation, in the target coastal and marine zones, of a range of the options for financial sustainability proposed in the Financial Sustainability Strategy developed under project 3616 “Establishing a Financially Sustainable National Protected Areas System”. In general, and in accordance with the recommendations of the Financial Sustainability Strategy, the approach of the project will be to promote the application of a three-pronged strategy aiming at:

- i) Increasing in the financial resources available in the ANAP for PA management, by raising awareness of the ecosystem services (particularly in relation to CC resilience) generated by coastal and marine PAs, developing instruments to support financial sustainability (such as PA level “business plans” including cost projections, income opportunities and investment plans), and providing training to ANAP staff at central and local levels on good financial management and income generation strategies (including taking advantage of opportunities for contributions from the private sector, and for raising funds through visitor fees);
- ii) Tapping into the technical and financial resources available to private development organisations, as partners in the management of PAs, subject to the overall normative and strategic framework of the SNAP and oversight by the ANAP;
- iii) Promoting “buy-in” by local communities, and community-level environmental governance, in order to reduce local threat levels and to join forces in combatting external threats, through a focus on active consultation and participation, inclusive rather than exclusive approaches to management and emphasising the interrelations between effective BD/PA protection on the one hand and livelihood sustainability and CC resilience on the other.

325. This output will be substantially co-financed by the TNC/USAID CMBA project. CMBA will promote a sustainable finance architecture for MPAs composed of four components: (i) local income-generating finance mechanisms (e.g. user fees) identified in site-based business plans; (ii) national protected area trust funds (NPATFs) and the associated Caribbean Biodiversity Fund (CBF); (iii) the C-Fish Fund³¹; and (iv) a Marine Enterprises Investment Fund (MEIF). This sustainable finance architecture has the potential to become a major breakthrough for MPA success. Key elements of this of relevance to the Three Bays National Park will include the establishment of private sector partnerships to support CMBA; and the regional-level work on a C-Fish Fund, as a MEIF could provide targeted financing for businesses in the Three Bays area.

e) Environmental education, training and awareness raising

326. The project will develop awareness and knowledge among key stakeholders regarding the importance of coastal and marine resources, and the options available for managing them. This will be targeted at, for example, MDE staff at central and local levels (particularly the ANAP), staff of ministries in related sectors (e.g. tourism, agriculture, education and planning), regional and municipal governments, NGOs and PDOs, and members of community-based organizations, and will result in increased dedication of effort and resources to coastal and marine conservation, and greater ability to develop and apply effective and sustainable conservation strategies: it is therefore vital for the social, institutional and financial sustainability of the impacts of the project.

327. The strategies to be applied will include the hosting and facilitation of workshops at central, regional and community levels regarding coastal and marine issues; the generation and dissemination of awareness raising materials, including posters, school materials and radio programmes; support to the formulation and implementation of university-level syllabi on marine ecology and conservation; the direct provision of classes on these subjects at BSc and MSc levels in national universities. Wherever possible this support will build on progress to date, for example by providing further training to the corps of “EcoDivers” that has been developed by the NGO ReefCheck, some of whom are currently supporting UNEP in its related projects in the south-west of the country.

328. The TNC/USAID CMBA project will also contribute significantly to this sub-output: Led by RARE, CMBA will pilot a new low-cost, 10-day training program (“Campaigning for Conservation,” C-4-C), drawing on RARE’s experience with PRIDE campaigns. C-4-C will build capacity of MPA managers, local NGOs, and others to develop and carry out effective social marketing campaigns that lead to strong female and male local constituencies for MPAs.

Output 2.3 Alternative livelihood options to reduce pressures on coastal and marine biodiversity

a) Alternative livelihood options to reduce pressures on coastal and marine biodiversity developed and applied at site level

329. At site level, the project will support and advise on the development, application and institutionalization of alternative livelihood options that will reduce pressures on coastal and marine biodiversity, and are feasible and attractive in social, economic and operational terms. The identification and implementation of these and other models of natural resource management and livelihood support will be achieved through highly participatory processes involving the members of local communities, in order to maximize the probability of their uptake, sustainability and compatibility with their overall livelihood support systems.

³¹ The **C-FISH Fund** is a new public-private partnership to provide sustainable funding to community-based Caribbean fish sanctuaries. The Fund will use a range of innovative and “business-based” fund-raising mechanisms to support livelihoods in vulnerable communities and encourage engagement of tourists, donors and stakeholders. The C-FISH Fund currently has the support of Virgin Holidays, The Travel Foundation, The Sandals Foundation and Royal Caribbean.

330. The promotion of alternative livelihood options will be resource demanding, and will therefore be supported by significant levels of cofinancing. This will include the following:

- *Support by the IDB in the Three Bays National Park (Complex 1)*, over a period of 2 years, for the formulation of an economic development strategy and business planning, resulting in 4-5 business concepts including “eco-caf  s”, sustainable salt production and the conversion of charcoal stoves to gas.
- *World Bank project “Relaunching Agriculture and Strengthening Agriculture Public Services-Phase II (RESEPAG)” (Complex 1)*, which will promote market-based access to inputs, under the new Ministry Agriculture approach of using demand-priming voucher systems to stimulate demand for planting material from nurseries, for fertilizer and other inputs, thereby strengthening incentives for the private provision of inputs.
- *IFAD project PPI-2: Development of Small Irrigation Systems Phase II (Complex 1)*, which will support the sustainable intensification and increase of agricultural production through efficient water management and consolidation of irrigated agriculture, and the facilitate of farmers’ access to financial services.
- *IFAD project PPI-3: Development of Small-Scale Irrigation and Access to Markets in Nippes and Goave Region (Complex 2)*, which aims to increase agricultural production through efficient water management and consolidation of irrigated agriculture, improve the value of products of irrigated agriculture and farmers' access to markets and financial services, and strengthen grass-root organizations’ planning, organization and management capacity in order to facilitate market linkages and access to financial services.

331. GEF resources will complement these investments in an incremental manner. Technical orientation will be provided on the range of BD-friendly alternative livelihood options available, and on strategies for optimizing their potential in BD terms. In the absence of this orientation, there is a risk that the promotion of poorly-considered economic/livelihood support activities in the vicinity of areas of high biological sensitivity could generate unintended negative impacts, for example through exceeding or degrading the regenerative capacities of natural resources (for example in the case of poorly planned tourism or extraction of non-timber forest products), generating pollutants (such as agrochemical runoff) that damage natural ecosystems, or attracting population that exceeds the carrying capacities of ecosystems and basic services. Funding will also be provided as necessary to cover the initial costs of investments in pilots of unfamiliar livelihood support options (such as ecotourism or fish farming) to which local people may be risk averse and/or not eligible for funding through the conventional financial sector.

332. Examples of the alternative livelihood options that will be promoted through the project and its partners are shown in (the specific options to be supported in each zone will be subject to final confirmation through consultation with the communities in question at project start-up).

Box 8. Examples of alternative livelihood options

Irrigated agriculture

This is the main focus, for example, of the IFAD-funded Small Scale Irrigation Development Project (PPI2) in Complex 1, and PPI3 in Complex 2; focusing on areas where people have some access to productive resources, PPI3 offers technologies to support individual irrigation systems and off-farm income-generating activities, through the development of irrigation systems, the establishment of a national water management programme and an emergency fund, strengthening of the capacity of public institutions and water users’ associations, improving land tenure security, and promoting the use of innovative irrigation technologies.

Honey production

When accompanied by community organisation and capacity development, and targeted at premium niche markets, the production of mangrove honey this has potential to provide dual environmental benefits, as an alternative to fishing and also as a source of motivation to the communities to conserve the mangroves from which the honey comes, which are also vital for the sustainability of fish stocks. There is excellent potential for growth in the coverage of apiculture, given that less than 1% of households nationally keep bees at present (despite the suitability also of the abundant *Prosopis juliflora* as a source of honey); and 87% of hives are of the low productivity traditional type, meaning that there is also much scope for improvement of productivity. Complexes 2 and 3 currently have among the highest levels of honey production in the country (with 15% and 13% respectively of the total number of hives nationally). In the course of one year the USAID Farmer to Farmer programme resulted in more than 1,000 beekeepers returned to raising bees, with more than 300 hives restructured and an increase in production from 3 to 7 gallons per hive³².

Iguana farming

There are numerous successful experiences with iguana farming in Central America³³. This activity involves the protection of areas of habitat and the installation of artificial nests in order to increase reproductive success; it has been shown to have much potential as a source of protein for local communities, as a source of income (through the sale of meat and/or young individuals for export to the pet trade), and as a means of restocking local populations of iguanas (in association with the protection of additional areas of natural habitat and environmental education programmes).

Tourism

There is significant potential for tourism development in all three complexes, and specific interest has been expressed by commercial investors in developing this sector in Complexes 1 and 2, both of which have major potential attractions (in Complex 1, these include beaches and historical sites, and in Complex 2 there are very attractive but undeveloped potential dive sites such as the “Blue Hole” to the south of Baraderes Peninsula). Target audiences include Haitian expatriates, North Americans, French-speaking visitors to Haiti, scuba divers and whale watching enthusiasts. In general, this sector is of high priority to the Government but at the same time there is an urgent need for its development to be guided by considerations of environmental and social sustainability, on which the project could advise in the target complexes.

Aquaculture

There are opportunities for the development of aquaculture on the coastal plains of the North and North-east Departments. Caribbean Harvest, a firm that has successfully piloted aquaculture production on the Cul-de Sac plain, is looking at the Lagon aux Boeuf area as a possible site where its aquaculture production could be extended. Potential annual income per pond (assuming annual fish production of 108kg/pond and \$7.20 per kg sale price) is estimated at around US\$777.

Horticulture

There is a substantial market for flowers both in Haiti and in the wider Caribbean. USAID has pioneered low-cost green houses that can be used to produce flowers and other high value produce. An average Haitian flower producer using traditional methods makes \$170 a year on a surface of 1,000 m², while a farmer who owns a greenhouse can generate between \$1,500 and \$2,500 annually depending on the crop, on only a 70m² area. The 120-member flower growers’ association in Furcy generates \$18,000 per year in revenue. The production of high-value market vegetables is a profitable venture with significant

³² <http://www.usaid.gov/results-data/success-stories/beekeeping-industry-reinvigorated-haiti>

³³ See e.g. <http://www.new-ag.info/99-3/focuson/focuson9.html>

opportunities for employment and improved livelihoods. This would be the case in Grande Anse and Nippes (particularly with the new road to Jeremie allowing transport to Les Cayes and Jacmel), and also in the highland areas of the South east Department. The production of flowers and market vegetables would have most potential as a livelihood option to fishing in cases where fishers' resource access systems span both coastal and highland areas, and as such will require further social analysis during project implementation.

Plastic recycling

In line with the recommendations of the STAP advisory document "Marine Debris as a Global Environmental Problem, Introducing a solutions based framework focused on plastic"³⁴, the project will assist local communities to turn plastic into a usable resource rather solely a problem, through the promotion of local enterprises based on plastic recycling (see for example <http://www.haitirecycling.org/pdf/haiti-recycling-english.pdf>): such enterprises would yield multiple benefits, through reducing the volumes of plastic present in coastal and marine environments, generating employment and income for local people, and providing livelihood alternatives with potential to reduce their dependence on fishing (thereby reducing fishing pressures on coastal and marine ecosystems).

b) Community-based structures for planning and implementing alternative livelihood options

333. These alternative livelihood options will be supported at local level by community-based structures for their planning and implementation, including strengthened village organizations capable of recognizing the magnitude and nature of environmental issues and mobilizing local and external resources accordingly, and strengthened local mechanisms for sanctions of activities which threaten coastal and marine ecosystems (such as the felling of mangroves or the pollution of water courses with agrochemicals). Wherever possible, the strengthening of local organizations will be coordinated with and build on the initiatives of NGOs and international cooperation projects and other existing initiatives.

c) Strengthened organizations and norms at local level to support alternative livelihood options

334. The project will also work with local communities and municipal authorities in negotiating, developing and applying municipal and community-based norms for natural resource management and environmental controls (for example on agricultural practices, NTFP extraction and infrastructural development). These will be developed through participatory multi-stakeholder processes of analysis which will enable participants to characterize conflicts and threats related to natural resource management, which affect their interests, such as the increasing levels of incursion of external fishers into the customary fishing areas of local communities, and the degradation of reefs and mangroves on which local people depend due to demographic changes and economic development.

Institutional strengthening to be undertaken by the project

335. In line with the principles of both GEF and UNDP, in the course of the delivery of the above outputs the project will place a strong emphasis on the strengthening of national institutions, both at central and regional levels. This will be essential for the long term sustainability of the model that the project will seek to introduce, set out in paragraphs 202-204. The institutions to be targeted by the project, and the strengthening strategies to be applied, will include (but not be limited to) the following:

Ministry of Environment (MDE)

336. The MDE will be the implementing partner for the project, through the National Protected Areas Agency (ANAP), the Director of which will be the National Director of the project. Other directorates of the MDE to be involved in, and strengthened by, the project, will include the Directorates of Soils and

³⁴ Available at <http://www.stapgef.org/international-waters>

Ecosystems, of Forests, and Environmental Evaluation. Support to provided to MDE and its respective directorates, resulting in a strengthening of their abilities to sustain the “ridge-to-reef” model of resilience and conservation promoted by the project, will include the following:

- Strengthening of the technical capacities of staff members in key positions, through their direct participation in project activities alongside counterpart advisers supported by GEF funds, and their participation in training courses funded by the project. This will result, for example, in increased knowledge and awareness among key staff members such as the Director of Protected Areas, heads of regional MDE offices and local PA personnel, regarding socially sustainable and biologically effective models of conservation and resource management.
- The direct funding of equipment to strengthen the presence and operational capacities of MDE at regional and PA levels in the target areas, and to partner entites such as the Surveillance Corps. This support will include, for example, computers and other office equipment, uniforms and field kit, buoys and signs to demarcate PAs, and promotional materials. In Complex 1, this will complement and consolidate support to be provided by IDB during the first two years of the project to the management of the Three Bays National Park.
- Provision of technical support (in complement to the Building Climate Change Adaptive Capacities project APCCC, funded by the European Union), resulting in the institutionalisation of mechanisms in the MDE and its partners for the effective generation and supply of environmental information to processes of environmental planning and decision-making processes, such as PA design and management planning by the ANAP, the formulation of environmental norms and regulations by MDE and regional/local governments, and territorial land use planning by local governments.
- Support to the application in practice of the financial strategy developed during the current GEF project, through support to MDE/ANAP by project staff and consultants to the development of a concrete action plan and the requisite regulatory and procedural instruments.
- Support to MDE/ANAP in the negotiation and implementation of partnerships which will permit the resources currently available to Government in support of PA management to be complemented by those available to private development organisations.

Ministry of Agriculture (MARNR)

337. The project will provide direct training to MARNR staff at central and local levels, with emphasis on how to incorporate CC resilience issues into agricultural development and extension programmes. In addition to training, it will advise on the incorporation of these issues into the extension programmes of MARNR, and their application at local level through the Commune-level Agriculture Offices (BAC). This support will be provided in collaboration with partner projects associated with MARNR in the target areas, such as the IFAD-funded PPI2 and PPI3 projects and the World Bank RESEPAG project.

Regional and Local Governments

338. Local Governments will be supported through the provision of direct technical advice and support in relation to issues such as environmental and land use planning, environmental governance, multi-stakeholder negotiation and conflict resolution in relation to environmental issues, and interactions with community-based organisations in relation to environmental issues. This will be achieved through direct interactions with local project staff (the two regional facilitators in each target complex) and with associated consultants, and through training events tailored to the specific needs of regional and local government staff. The project will also provide concrete support, for example in terms of computers,

databases and monitoring equipment, in order to bring the regional and local government offices up to the levels required to function within the context of the project.

Incremental reasoning and expected global, national and local benefits

Table 6. Adaptation benefits:

Current situation	Alternative to be put in place by the project	Adaptation benefits
Increased resilience to climate threats in key watersheds and coastal ecosystems		
<ul style="list-style-type: none"> - Low levels of natural resource governance and poor natural resource management in watersheds, resulting in increased vulnerability of production systems to climate change, and increased vulnerability of coastal populations and ecosystems to flooding and pollution, which undermine their potential to sustain livelihoods and contribute to EBA. - Inadequate/ineffective provisions for incorporating considerations of EBA and climate risk management into the location and design of economic development initiatives - Limited options available to local people for meeting livelihood needs without undermining CC resilience 	<p>Soil- and water-conservation practices furthering EBA in target watersheds, and protection and restoration of vulnerable ecosystems of importance for EBA, supported by</p> <ul style="list-style-type: none"> - Integrated policy, strategic and planning framework for CC adaptation approaches to be applied in priority watersheds, - Strengthened mechanisms and capacities for environmental decision-making in relation to CC adaptation in the target watersheds - Planning framework for the integration of considerations of EBA, CC risk management, watershed management, sustainable development and poverty reduction - Governance framework for EBA, CC risk management and sustainable development - Models for natural resource management developed, applied and institutionalized at site level - Community-based structures for planning and implementing EBA, CC risk reduction and watershed management <p>This will result in livelihood support activities being carried out in ways which promote EBA and resilience to climate risks; productive and infrastructural initiatives being located more appropriately in the landscape; and reduced levels of threats from illegal activities.</p>	<ul style="list-style-type: none"> - Increased coverage of soil- and water-conservation practices which further EBA and climate risk resilience; - Increased biological viability of coastal ecosystems and therefore their contribution to EBA; - Stability in the areas and conditions of key areas of ecosystems of importance for EBA, climate risk management, connectivity and watershed management; - Improvements of indices of ecosystem health and environmental services in key areas of ecosystems of importance for EBA, connectivity and watershed management; - Increases in coverage and quality of vegetation in vulnerable parts of target watersheds, as a result of reforestation and/or restoration activities in order to increase CC resilience; - Increases in coverage and quality of mangroves in target areas, providing improved protection against sea-level rise and wave impact, as a result of reforestation and/or restoration activities; - Reduced economic losses through management (establishment, maintenance, etc.) of climate resilient natural assets.

Table 7. Global Benefits:

Current situation	Alternative to be put in place by the project	Global benefits
Establishment and management of PAs in the marine and coastal zone		
<ul style="list-style-type: none"> - Low levels of governance in existing and candidate PAs, 	<p>Refined proposals for the PA estate in the MCZ (Output 1.1) and strengthened instruments and capacities for the effective</p>	<p>Improved coverage and effectiveness of PAs, and corresponding reductions in threats, will result in stability in the areas and intactness indices of mangroves, eel grass beds, reefs and bay</p>

<p>resulting in overfishing and habitat destruction</p> <p>- Low levels of management capacities for existing and candidate PAs</p>	<p>management of PAs (Output 1.2), resulting in Increase in the coverage of coastal and marine ecosystems that have been declared and gazetted as protected areas (by category), by around 94,887ha and 10% increase in the average management effectiveness rating of target PAs (including improvements in infrastructure and enforcement), measured through the GEF Management Effectiveness Tracking Tool (METT), resulting in reduced threats (such as extraction of timber, overfishing, extraction of sand, coral mining and pollution) affecting biodiversity of global priority and importance for local livelihoods.</p>	<p>habitats in target PAs, allowing these to continue to function as habitat for threatened or seriously endangered species, such as the American crocodile, Atlantic leatherback sea turtle, Atlantic Hawksbill sea turtle, flamingo, black-crowned palm tanager, northern mockingbird and cave swallow. A highly significant additional benefit will be the protection of flows of ecosystem products and services for local communities, including sustainability of fisheries (the mangrove forests of the Caracol and Fort Liberté Bays play an important role in the reproduction cycle of numerous coastal and pelagic fish species of livelihood and commercial importance) and protection from storm surges. The environmental services provided by Caracol Bay alone have been estimated to have a total value of US\$110M per year.</p>
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Socioeconomic benefits to be delivered by the project

339. The environmental and socioeconomic benefits of the project will be closely interlinked. The protection of coastal and marine ecosystems (directly, through the PA strengthening actions proposed under Component 1 and indirectly, through the improved watershed management actions proposed under Component 2) will serve to safeguard their long-term potential to sustain livelihoods in fisher communities located along the coastal zones of the target areas, and to buffer these communities against the impacts of climate change (such as wave impact and sea level rise). The improved management of the watersheds which lie inland from these ecosystems will increase the sustainability of livelihoods in farming communities located in the watersheds, and the resilience of their production systems to the impacts of climate change; it will also reduce the exposure of populations living downstream to environmental threats (related in large part to climate change), such as flash flooding and landslides.

340. The design of the project recognizes the need to combine environmental protection with the satisfaction of the short term livelihood and income needs of impoverished local people. Therefore, rather than attempting an (in the current context of Haiti) impractical and unenforceable exclusive approach to conservation, it will seek to ensure that economic development and livelihood support initiatives are carried out with the minimum of impacts on BD and other natural resources and, where possible, “win-win” options are implemented which allow sound natural resource management to contribute actively to the stability of local people’s livelihoods.

341. In accordance with this framework, the concrete socioeconomic benefits to be delivered will be as follows:

- **Increased resilience of farmers to climate change.** As a result of the project, a total of 306,850 farmers, distributed between the three target complexes, will be applying conservation agriculture practices that incorporate specific measures to reduce the vulnerability of the agricultural aspects of their livelihoods to climate change. This in turn will contribute to an increase in farmers’ perceptions of the CC resilience of their livelihoods in all of the target communities.
- **Reduced exposure of populations downstream to environmental risk resulting from poor watershed management,** particularly flooding, resulting from the sedimentation of water courses due to erosion upstream, and flash floods resulting from landslides due to deforestation upstream.

The magnitude of this benefit is hard to quantify given the stochastic nature of the extreme rainfall events which these risks are typically associated, but a total of at least XX persons, defined as residents of the main urban centres downstream of the areas where the project will promote improved watershed management, will potentially benefit.

- **Alternative livelihoods for fishers:** the project will seek to reduce the levels of fishing activity in the target areas by supporting the development of alternative livelihood options. As a minimum, this will constitute a social mitigation strategy that will ensure that fishers and their families suffer no net negative impact on their livelihoods as a result of the reduction of fishing levels; in fact, given the imminent collapse of fisheries that is suggested by PPG studies (due to overfishing compounded by climate change), this strategy has the potential to increase livelihood sustainability through the inclusion of alternative and more resilient livelihood support options.
- **Increased sustainability of fishing:** reductions in the overall numbers of people fishing will mean that it will become more sustainable and profitable for those that continue to fish, as the recovery of ecosystem health and fish populations will lead to increases in fish availability and size, and therefore improved unit prices.

342. The project will employ a number of strategies aimed at optimizing these socioeconomic benefits:

- Maximization of the participation of local people (including women) in the formulation and implementation of the proposed natural resource management and livelihood substitution strategies, thereby ensuring their compatibility with sociocultural considerations and the functioning of existing livelihood support systems.
- A preferential focus on the promotion of livelihood substitution strategies that provide opportunities for the participation of women, such as small-scale manufacturing, commerce and ecotourism. These options will be targeted in particular at the women who are currently involved in the commerce of fish, and whose livelihoods and power status might otherwise be negatively affected by any reduction in fishing activity.
- Improved EIA (including social aspects) that will help to ensure that economic development initiatives do not undermine natural capital on which local livelihoods depend (e.g. by polluting aquatic ecosystems of importance for fish reproduction)

Key indicators, risks and assumptions

RISK	RANKING	MITIGATION STRATEGY
Climate change, resulting in changed/increased pressures on marine and coastal ecosystems, for example due to sea level rise and increased frequency/intensity of storm events.	Medium	The project's emphasis on conserving mangroves will confer benefits on marine and coastal ecosystems in general, due to the buffering and stabilizing effect these have in the face of sea level rise and storm impacts. Through its support to PA design and territorial land use planning the project will ensure that PAs and other spatial units within the landscape provide for CC-related changes, for example by designating zones into which ecosystems such as mangroves (whose limits are naturally defined by sea level and salinity thresholds) can migrate as these thresholds move upwards and inland.
Policy support for economic	Medium	A central feature of the design logic of the project is

development initiatives at the expense of natural resource and biodiversity conservation		the demonstration to policy makers and planners of how economic development, livelihood support and the conservation of natural resources and biodiversity can be made compatible, and the creation of the mechanisms and capacities required to put this into practice.
Weak institutional capacities for planning, management and governance in the target PAs and watersheds.	Medium	The project will invest in filling key capacity gaps: risk will further be reduced by involving multiple actors in supporting watershed management and BD conservation, including (as complements to the relevant entities within MDE and other relevant sector ministries), NGOs, private development organisations and community-based organisations.
Limited capacity, commitment and/or governance among local people in the target PAs and watershed.	Medium	The project will work in a participatory manner with local communities to discuss and define the strategies to be implemented at local levels, in order to maximize the likelihood of ownership and uptake. It will also work as closely as possible with, and strengthen, community-level governance structures.

Financial modality

343. Project resources will be provided as a donation, principally to build capacities within Government and other stakeholders and central, regional and community levels. 40% of the LDCF resources under Component 1 (around 22% of the total GEF/LDCF project resources) will be directly invested in ecosystem rehabilitation in order to generate more immediate CC resilience benefits.

Table 8. Total Project Budget per Outcome

Project Components	GEF Financing		Co-Financing		Total (\$)
	(\$)	%	(\$)	%	
1. Increased resilience to climate threats in key watersheds and coastal ecosystems.	5,125,685	56	24,000,000	57	29,125,685
2. Establishment and management of PAs in the marine and coastal zones of target watersheds	3,574,380	39	16,000,000	38	19,574,380
Project Management	435,003	5	40,000,000	5	2,435,003
Total Project Costs	9,135,068	100	2,000,000	100	51,135,068

Cost-effectiveness

344. The adoption of a landscape-wide EBA approach, with a particular focus on watersheds and coastal ecosystems, will be more cost-effective than infrastructural solutions. Table 9 shows the estimated costs of physical defence works in the Caribbean islands: it is estimated that an EBA approach to coastal protection would cost around 10% of this³⁵.

³⁵Project Document for Adaptation Fund project “Reduction of vulnerability to coastal flooding through ecosystem-based adaptation in the south of Artemisa and Mayabeque provinces” in Cuba

Table 9. Cost estimates for physical coastal defence works in the Caribbean islands³⁶

Type of structure	Cost (US\$/m)
Concrete and rock coating	650-975
Rock breakwaters	650-975
Concrete breakwaters	680-1,170
Offshore rock breakwaters	2,925-3,900
Offshore concrete breakwaters	3,250-4,225

345. The relative cost-effectiveness of the EBA approach is even greater when the ecosystem services of mangroves are taken into account: the conservative estimate of Constanza et al. shown in Table 10 is that these are worth around \$9,900/ha/year.

Table 10. Estimated mangrove ecosystem services worldwide³⁷

Source	Region	Ecosystem services included	Value, US\$/ha/yr
Constanza <i>et al.</i>	Worldwide	All services	9,900
Sathirathai and Barbier	Thailand	All services	27,264-35,921
Ronnback	Worldwide	All fisheries	750-11,280
Aburto-Oropeza <i>et al.</i>	Mexico	Fish and blue crab fisheries	37,500

346. Although around 22% of total GEF/LDCF resources will be directly invested in ecosystem rehabilitation, the remainder will be used for capacity development in Government and other stakeholders. This will be a more cost-effective solution in the long term than investing all project resources in direct rehabilitation, as it will permit resilience and conservation benefits to be maintained and scaled up, thereby reducing continued long-term dependence on external financial support.

347. A BD1 approach, focused on protected areas, is considered to be more cost-effective than a BD2 approach focused on mainstreaming in production sectors and value chains, given that market conditions in Haiti in the sectors most directly associated with the project (particularly fisheries) are insufficiently developed at present to provide realistic prospects of significant return on investment, in terms of changes in productive behaviour in response to market stimuli.

Sustainability

Institutional and financial sustainability:

348. The project will place particular emphasis on developing capacities at both local and national levels in the Ministry of Environment and NGO partners, as well as municipal governments and local community organizations in and around the specific PAs which the project will target. This diversified approach, and in particular the involvement and strengthening of institutions at local level, will be of key importance in ensuring institutional sustainability, as they will avoid placing excessive reliance on the still incipient capacities of the Ministry of Environment. The governance frameworks and community-based structures proposed under Component 2 will further complement and support the actions and capacities of Government institutions, while (under Output 2.6) the project will strengthen capacities among community-based organizations to garner further institutional support they may need beyond the life of

³⁶ <http://www.unesco.org/csi/pub/source/ero18.htm>

³⁷ Aburto-Oropeza *et al.* PNAS . July 29, 2008. vol. 105. no. 30 _ 10457 ENVIRONMENTAL SCIENCES information online at www.pnas.org/cgi/content/full/0804601105/DCSupplemental

the project. The project will also help to develop a new generation of natural resource/conservation professionals to staff these different institutions, through its strengthening of curricula and capacities in national universities under Output 2.2.

349. The financial sustainability of the target PAs will be addressed by supporting the implementation of the financial strategies proposed under GEF/UNDP project 3616 “Establishing a Financially Sustainable National Protected Areas System”. Increases in Government funding to the PA system are expected to result from growing awareness of the environmental services provided by coastal and marine ecosystems, and the increased profile of the ANAP, as well as the provision by the project of infrastructural and equipment support at site level which will create favourable conditions for the assignation by MDE of additional PA staff. As explained under Output 2.2e above, financial sustainability will require Government budget to be complemented by increased participation of NGOs/PDOs in taking on responsibilities for PA management and in generating additional PA funding; effective participation of local communities in order to take advantage of their capacities for governance and active management, and in order to reduce local threats and corresponding costs of surveillance and enforcement; and contributions from the private sector (for example investors in the Caracol Bay Industrial Park in Complex 1, and tourism operators).

Environmental sustainability

350. The CC resilience and BD conservation strategies to be promoted by the project will inherently be environmentally sustainable. There is some risk of the alternative livelihood strategies that will be promoted in association with partner projects and institutions lacking environmental sustainability (for example aquaculture or agriculture projects displacing natural ecosystems or generating wastes); however project technicians will work closely with partners in the development of these alternatives in order to ensure that safeguards are applied. Emphasis will be placed on working with local communities in an integrated manner, presenting livelihood support, environmental sustainability and governance as related and mutually dependent aspects of the same “package” of benefits.

Replicability

351. The three target complexes were chosen not only in terms of the direct potential to generate environmental and resilience benefits in each, but also on the basis of their diversity: between them, they include a range of climatic, ecological, edaphic, topographical and socioeconomic conditions, enabling them to function effectively as laboratories for CC resilience and BD conservation strategies with potential for replication in virtually any other watershed-coastal/marine complex in the country.

PART III. MANAGEMENT ARRANGEMENTS

Arrangements and responsibilities

352. The duration of the project will be 5 years. It will be executed by the Ministry of Environment, in close collaboration with other sector-based Ministries. Technical and operational support leading to the delivery of the proposed outputs will be provided by a team of GEF/LDCF funded thematic specialists, consultants and administrative staff, contracted by UNDP, operating at central and regional levels in close collaboration with MDE and local governments, under the guidance of a GEF/LDCF-funded National Project Coordinator (NPC). The NPC will work in close collaboration with, and receive strategic guidance from, a National Project Director (NPD) appointed by the Minister of Environment from among MDE high level staff.

353. Project implementation will be guided and supported by the following entities:

1) Project Board

354. The Project Board (Steering Committee) will be established at the national level, composed among others of Ministries of Environment, Agriculture/Fishery Division, Tourism, Finances, Planning and the Interior, and the Haitian Civil Society Platform for Climate Change, with the Ministry of Environment as chair and the Ministry of Agriculture as vice-chair. It will provide guidance and oversee the overall performance of the project, the implementation of activities and the achievement of the project outcomes and results. It will also validate outputs, resolve conflicts, remove bottlenecks and advise on steps to be taken to move forward.

355. The composition, responsibilities and rules of operation of the Board will be confirmed during its first meeting. Subject to the decision of this meeting, it is proposed that the Board will be responsible for approving the operational plans and annual reports of the project as well as the terms of reference and appointments of key members of staff. The Board will meet at least two times per year and in addition could be convened extraordinarily by the Chair, on the request of individual members.

356. The Project Board will be responsible for making executive decisions for the project, in particular when guidance is required by the Project Coordinator. The Project Board will play a critical role in facilitating inter-ministerial coordination, project monitoring and evaluations by quality assuring these processes and products, and using evaluations for performance improvement, accountability and learning. It will ensure that required resources are committed and will arbitrate on any conflicts within the project or negotiate a solution to any problems with external bodies. In addition, it will approve the appointment and responsibilities of the Project Manager and any delegation of its Project Assurance responsibilities. Based on the approved Annual Work Plan, the Project Board will also consider and approve the quarterly plans and will also approve any essential deviations from the original plans.

357. In order to ensure UNDP's ultimate accountability for the project results, Project Board decisions will be made in accordance to standards that shall ensure management for development results, best value for money, fairness, integrity, transparency and effective international competition. In case consensus cannot be reached within the Board, the final decision shall rest with the UNDP.

2) Regional Technical Advisory groups

358. At regional level in each of the target zones, technical advice will be provided to the PMU from a Regional Technical Advisory Group (RTAG). This will consist of, where these mechanism exist, Departmental Consultative groups such as the Departmental Resilience Consultative Group in the North-

East and Grande Anse (for the Nippes area) and the Departmental Environmental Sector Platform in the South-East. Where this is not possible, the RTAG may be selected on an *ad hoc* basis from relevant institutions, agencies and individuals operating at the departmental level. The RTAG will be called together in sub groups to advise the PMU on specific issues as and when necessary, provide independent technical guidance, advise on existing knowledge and best practices if available.

Project Director

359. The project will be under the overall leadership of a National Project Director (NPD), who will be the Director of Protected Areas in the Ministry of Environment, and will be responsible for orienting and advising the National Project Coordinator on Government policy and priorities. The NPD will also be responsible for maintaining regular communication with the lead institutions in the agriculture and livestock sectors and ensuring that their interests are communicated effectively to the National Project Coordinator.

Project Management Unit

360. Project implementation will be the responsibility in practice of a Project Management Unit (PMU), led by a National Project Coordinator (NPC) working in collaboration with the NPD. The NPC will:

- Be the signing authority of requests to UNDP for disbursements of project funds.
- Ensure the logistical, administrative and financial effectiveness of the IP in fulfilling its roles set out above
- To this end, provide monitoring, supervision and guidance to the technical teams based in the project areas

361. Each member of the PMU will have responsibilities for the supporting the delivery of specific outputs proposed in PART I above, as set out in Table 11.

362. In order to maximise national ownership and sustainability, each of the full-time staff members of the project will ensure that permanent staff members of the MDE are fully involved in project planning activities and are copied on all relevant project correspondence. Specifically:

- The Directorate of Human Resources of the MDE will be involved in and copied on all messages regarding activities aimed at the institutional strengthening of the institution.
- Departmental Directorates of MDE will be informed and given the opportunity to comment on all activities funded by LDCF resources in their areas of influence, under Component 1 of the project.
- The ANAP will be involved in and informed about all activities foreseen under Component 2 of the project.

363. The PMU will closely assist the Ministry of Environment in performing its roles, in particular by strengthening the following six entities:

- The National Agency for Protected Areas (ANAP), under outputs 2.1 and 2.2, in collaboration with relevant stakeholders. Of particular interest for the ANAP are activities dealing with the development and adaptation of co-management arrangements for Marine Managed Areas, preparation of Integrated Marine Protected Area Plans including inter alia the collection of data necessary for monitoring and evaluation of adaptive management, zoning plans, activities to ensure sustainable use, policy and legislative instruments in support of the financial sustainability of MPAs; and short-term training courses in MPA, including study tours for ANAP staff;
- The National Observatory of the Environment and Vulnerability to be reinforced in a context of subcontract with CATIE (see partnership arrangement)

- The Forestry Division and the Soils and Ecosystems Division under the outputs 1.2, 1.3. Under this reinforcement Ecological landscape and ecosystems restoration, VVA methodology and tools, formulation of adaptation and resilience plans based on predictive scenario models, support to reforestation and watersheds management activities will be at the core of efforts of the Project;
- The Environmental Surveillance Corps (ESC) will be also strengthened by putting the ESC in situation to deploy coastal and marine brigades where the project will operate.

364. At the regional level, the project will reinforce the Departmental Directions of the Ministry. Technical advice will be provided by a RTAG. This will consist of, where these mechanism exist, Departmental Consultative groups such as the Resilience Departmental Consultative Group in the North-East and Grande Anse (for the Nippes area) and the Table Departementale Sectorielle de l'Environnement in the South-East. An other option is that the RTAG could be selected on an ad-hoc basis from relevant institutions, agencies and individuals operating at the departmental level. The RTAG will be called together in sub groups to advise the PMU on specific issues as and when necessary, provide independent technical guidance, advise on existing knowledge and best practices if available.

365. An exit strategy and plan will be developed during the last year of the project since it is envisaged that the project will have developed the capacities and associated environment for resilience and EBA to continue without external interventions once funding ceases.

Table 11. Technical staff composing Project Management Unit, with responsibilities

Staff member	Responsibilities/outputs
Full-time staff, central office (3)	
General coordinator	Overall coordination and institutional liaison
	1.1b Definition of arrangements for inter-institutional collaboration and responsibilities in relation to EBA
	2.2c Institutional strengthening programme at national level for PAs
Coordinator Component 1 (specialist in NRM and EBA)	1.1a National strategy and spatial prioritization documents aimed at optimizing the delivery of EBA benefits nationwide
	1.2a Models for natural resource management developed and applied at site level
	1.2d Resilience and adaptation guidance
	1.2e Systematization of Payment for Ecosystems Services (PES) models in the three target zones
	1.3 Assisted rehabilitation—to recover ecosystem functionality
	2.3a Alternative livelihood options to reduce pressures on coastal and marine biodiversity developed and applied at site level
Coordinator Component 2 (specialist in BD and PA)	2.1a Declaration of Managed Marine Areas (MMAs) in all three target complexes
	2.1b Internal zoning of PAs
	2.1c Detailed studies of environmental and social baselines
	2.2a Definitions of management provisions and corresponding management instruments
	2.2c Institutional strengthening programme at national level for PAs
	2.2d Financial mechanisms to support PA management
Full-time regional staff (2/region = 6)	
3 regional facilitators (NRM and EBA)	1.1c (i) Strengthened platforms for multi-stakeholder decision-making in relation to EBA
	1.2a Models for natural resource management developed and applied at site level
	1.2b Community-based structures for planning and implementing EBA and watershed management
	1.2c Strengthened organizations and norms for environmental governance at local level
	1.3 Assisted rehabilitation—to recover ecosystem functionality
	2.3a Alternative livelihood options to reduce pressures on coastal and marine biodiversity developed and applied at site level
3 regional facilitators (BD and PA)	2.1a Declaration of Managed Marine Areas (MMAs) in all three target complexes
	2.1b Internal zoning of PAs
	2.2a Definitions of management provisions and corresponding management instruments
	2.2b Programme for training and strengthening local organizations
International consultants with one-off short term inputs	

Staff member	Responsibilities/outputs
International consultant on EIA/SEA, environmental decision-making and territorial land use planning	1.1c (ii) Formalized and effective procedures for Environmental Impact Assessment and Strategic Environmental Assessment incorporating considerations of CC resilience
	1.1c (iii) Improved mechanisms for information flow to environmental decision-making processes
International consultant on NRM/EBA	1.3 Assisted rehabilitation—to recover ecosystem functionality
International PA specialist	2.1a Declaration of Managed Marine Areas (MMAs) in all three target complexes
	2.1b Internal zoning of PAs
	2.2a Definitions of management provisions and corresponding management instruments
International consultant on PA financing	2.2d Financial mechanisms to support PA management
National consultants with regular inputs over long term	
National consultant participation, gender, strengthening of CBOs	1.1c (i) Strengthened platforms for multi-stakeholder decision-making in relation to EBA
	1.2b Community-based structures for planning and implementing EBA and watershed management
	1.2c Strengthened organizations and norms for environmental governance at local level
	2.2b Programme for training and strengthening local organizations
	2.3b Community-based structures for planning and implementing alternative livelihood options
	2.3c Strengthened organizations and norms at local level to support alternative livelihood options
National consultant M&E	
National consultant on strengthening of environmental institutions	1c (ii) Formalized and effective procedures for Environmental Impact Assessment and Strategic Environmental Assessment incorporating considerations of CC resilience
	1.1c (iii) Improved mechanisms for information flow to environmental decision-making processes
	1.1d) Territorial land use plans, taking into account spatial variations in CC vulnerability and EBA potential
National consultant on private sector liaison and advice	1.1e) Plans for environmental management and investment in support of EBA
National consultant on PA financing	2.2d Financial mechanisms to support PA management
Contractual services - companies	
Environmental/social consultancy company/NGO	1.1f Regional/departmental predictive climate change models
	2.1c Detailed studies of environmental and social baselines

Partnership arrangements

366. The success of the project will depend largely on involvement by stakeholders at different levels and empowering national institutions and local communities to ensure a sense of ownership and responsibility for project outcomes. The project will engage, at national and regional level, a diverse group of stakeholders that will include (see table below for more details):

- (i) Community-based organizations, local development associations and resource users associations (fishermen associations);
- (ii) Service providers (NGOs, Environmental Foundations, Government implementing agencies, private development operators and professional associations) that could take the form of contractual services or soft agreement or arrangement (no paid services) as well research institutions involved in the development and delivery of demand driven research and extension;
- (iii) Government agencies, including Municipalities and local authorities, in the context of governance, policies, plans, guidance and mainstreaming EBA and resilience into their operations;

367. Coordination between agencies, including other GEF projects, will be vital to minimize or avoid duplication, to improve effectiveness of activities, and to scale up impacts. Linkages between agencies including UNEP, FAO, WFP, IFAD, DFID, World Bank, IDB, EU, GIZ and AECID will be promoted, in consultation with partners and the Government, through two more structured coordination mechanisms:

- 1) The **Technical Group of Political Champions for Resilience in Haiti** (TG-PCR/Haiti), aiming at playing an ambassadorial and advocacy role in favor of causes and issues that relate to resilience and its relation to the development process across the country;
- 2) The **Permanent Working Group on Protected Areas** (GTAP), a consultation and harmonization mechanism promoted by the UNDP/SNAP Project and the Swiss Cooperation Development Division (DDC), that will play an advisory and coordination role to ANAP.

Table 12. Proposed partnership arrangements with key stakeholders

Partner	Category of partners	Roles in Haiti/EBA/Resilience project implementation	Legal nature of the partnership
National level			
Ministry of Agriculture (Division of Fishery and Departmental Directions)	Service providers and guidance	Member of the National Steering Committee (See institutional implementation arrangements) and key involvement in the consultation process to create new Marine Managed areas; Promotion of community sustainable fisheries including best practices; CC resilient farming and aquaculture production techniques and systems introduced at the community level; nursery for continuous supply of resilient traditional plants in case of climate related disruptions; prioritize vulnerability and adaptation options including “no regret” options such as organic farming and soil conservation methods;	MOU for output 1.2 and part of output 1.3 and 1.4
Ministry of Interior (DPC, Departmental Delegations and Communal Committee for Civil Protection	Guidance, mainstreaming EBA and resilience and service providers	Member of the National Steering Committee; integration of EBA and resilience into disaster risk policy and plans, coordination mechanism and field operations; harmonization and consultation with EBA project to develop and apply relevant Vulnerability and Adaptation Assessment (VAA) approach and tools; conduct VAA in pilot communities and train technical and community leaders on the approach and tools	MOU for part of output 1.4
Ministry of Economy and Finances; Ministry of Planning and Cooperation/CIAT	Guidance, mainstreaming EBA and resilience	Members of the National Steering Committee; promote and lead a Task Force with the Ministry of Environment and other relevant entities to ensure the financial sustainability of Protected Areas and the mainstreaming EBA/resilience to CC into policies and plans; insertion of EBA project into the national budget of investment through the named “ Fiche d’Identité et d’Opérations/FIOP” instrument to include financial provisions to complement financial resources of EBA Project	MOU for output 1.1 but no contractual services included
Ministry of Tourism	Guidance, mainstreaming EBA and resilience	Member of the National Steering Committee; integration of marine conservation aspects into their field operations; possibility to include Baradères/Cayemites and South-East Target Zones into the Tourism Development Plan	Normal cooperation between State Agencies
CATIE with national partners: University of Limonade, Agronomy and	Services provider	Provision of scientific and application-oriented backstopping to the national institutions mentioned that focus on watershed management and climate change, as well as on the development and implementation of sustainable land-use systems, regional/departmental predictive climate modelling using	Contractual services

Partner	Category of partners	Roles in Haiti/EBA/Resilience project implementation	Legal nature of the partnership
Veterinary Collège/State University of Haiti and the Observatoire National de l'Environnement et de la Vulnérabilité (ONEV)		climate forecasting for the 3 target zones to prepare relevant Community-Based Adaptation Plans; Data Information and Knowledge Management; technical and scientific back-up to apply VAA methodology.	
Haitian Civil Society Platform on Climate Change (PSC-CC)	Service providers	Climate Change outreach and education ; prepare a Resilient Community-Based Training Manual for the 3 Target Zones	Contractual services for part of output 2.2 dealing with training and strengthening local organizations
Complex 1 (North East)			
Municipalities including local authorities managing communal sections/CASEC and ASEC (Limonade, Caracol, Terrier Rouge, Ferrier, Trou du Nord, Fort Liberté, Ouanaminthe, Carice, Mont Organisé, Capotille and Vallières)	Guidance, mainstreaming EBA and resilience	Members of the Regional Technical Advisory Group (see institutional implementation arrangements); Municipalities have jurisdiction over the coastal areas and watersheds associated; development of management plans for the Parc des 3 Baies; involvement in adaptation measures and compliance to protect coral reefs, promote sustainable harvesting of in-shore fisheries; involvement in foreshore protection measures including revegetation and establishment of set back zones to control aggregate removal of corals and mangroves for construction and other uses; selection of sub-watersheds and micro-catchments for adaptation measures; municipal ordinances for compliance in liaison with ecosystems and landscapes protection within the context of the Parc des 3 Baies	Normal collaboration between Central Government and Municipalities and local authorities
FOPROBIM	Services provider	Corail reefs and mangroves rehabilitation and management plans in the Parc des 3 Baies with gender sensitive planning and interventions; technical assistance to optimize salt value chain; local level assessment, with an adaptation lens, of CC risks facing the fisheries sector; propose and implement a	Contractual services

Partner	Category of partners	Roles in Haiti/EBA/Resilience project implementation	Legal nature of the partnership
		community-based approach to co-management of fisheries resources.	
OXFAM/GB	Guidance, mainstreaming EBA and resilience and services provider	Assist communities and households (Vallières, Carice and Mont Organisé communes) to plan and implement adaptation activities aimed at improving and sustaining food and crop production (in consultation with the Ministry of Agriculture) that will be resilient to climate impacts including in-situ collections of diverse useful plants in farmer's food gardens or proved resilient crops from Dominican Republic, agroforestry plots and farmer training and vocational centers to ensure the continuous supply of resilient traditional planting materials to farmers; watersheds restoration measures (sub-watersheds and microcatchments) in Vallières, Carice and Mont-Organisé	Contractual services
CARITAS	Guidance, mainstreaming EBA and resilience	Orientation of client base to benefit vegetable production package and techniques in Vallières, Carice, Mont Organisé	Soft agreement
SGP/UNDP	Guidance, mainstreaming EBA and resilience	Collaboration and synergy in Community-Based Adaptation measures to CC targeting mangroves rehabilitation	Soft agreement
Agro Action Allemande	Services provider	Management of remaining dry forests (<i>Prosopis juliflora</i> among others) with charcoal producers in the 3 bays; watershed restoration involving adaptation and resilient measures in Trou du Nord.	Contractual services
University of Limonade	Guidance, mainstreaming EBA and resilience	Involvement of professors and students in technical and scientific backstopping activities (See National scale)	Contractual; part of the CATIE package
Local fishermen associations including inter alia Brigade Maritime en Action, Association des Pêcheurs de Caracol etc	Local resource users associations	Participatory management arrangements in the Parc des 3 baies and sustainable use of coastal marine fishing resources (Community-based fisheries management); involvement of Brigade Maritime en Action members and others in the embryonic regional Parc des 3 Baies Environmental Surveillance Corps Brigade (to be put in place) in patrolling and compliance; building local capacity	Cost will be taken in charge by EBA/Resilient Project through some contractual services envisaged and the Ministry of Environment
Local communities including inter alia Réseau des	CBOs, Local development associations	Participatory management arrangements; active participation in livelihood demonstration projects	Cost will be taken in charge by EBA/Resilient

Partner	Category of partners	Roles in Haiti/EBA/Resilience project implementation	Legal nature of the partnership
Femmes Actives pour le Développement de Trou du Nord, Union des Jeunes pour le Développement et la Reforestation de Trou du Nord etc			Project through some contractual services envisaged and the Ministry of Environment
Complex 2 (South West)			
Municipalities including local authorities managing communal sections/CASEC and ASEC (Baradères, Petit Trou de Nippes, Corail, Grand Boucan, Pestel/Cayémites and Corails	Guidance, mainstreaming EBA and resilience	Members of the Regional Technical Advisory Group; development of management plans for Marine Managed Areas; involvement in adaptation measures and compliance to protect coral reefs, promote sustainable harvesting of in-shore fisheries; involvement in foreshore protection measures including revegetation and establishment of set back zones to control aggregate removal of corals and mangroves for construction and other uses; selection of sub-watersheds and micro-catchments for adaptation measures; municipal ordinances for compliance in liaison with ecosystems and landscapes protection and Marine Managed Area	Normal collaboration between Central Government and Municipalities and local authorities
FEDA S.A (Ferme d'Expérimentation et de Démonstration Apicole, Beekeeping Experimentation and Demonstration Farm)	Service provider (Private development Operator)	Production of ecological honey and other beekeeping products including vinegar according to international standards and norms ; could promote and intensify this ecological production in the target zone by providing more services to beekeepers; could be contracted to promote ecological honey production in South-East and North-East as alternatives livelihoods	Contractual services
International Red Cross	N/A	Collaboration in VAA methodology and local adaptation and resilient plans	Soft agreement

Partner	Category of partners	Roles in Haiti/EBA/Resilience project implementation	Legal nature of the partnership
Local Fishermen Associations including Association des Pêcheurs pour le Développement de Grand Boucan, Association des Pêcheurs de Anse Dunord, Association des Pêcheurs de Anse-à-Mason, Association des Pêcheurs de Basse, Union des Pêcheurs pour le Développement de Baradères	Local Resources users association and services provider	Community-Based fisheries management based on safeguard management and code of practices for fisheries strategic stocks (lobsters, conches etc) to protect reproduction zones and spawning grounds of fish species, to regulate sizes of catches, period of fishing to avoid to seize individuals in in period of reproduction (lobsters particularly), to regulate the number of fish engines; alternatives livelihoods; promotion of good practices in term of self regulations promoted by the Fishermen Association of Anse Dunord	Contractual services with a grouping of fishermen associations
ABE (Altènatif pou yon Lòt Baradè San Esklizyon)	Service provider	Local governance, Territorial planning and land-use	Possible contractual services
Complex 3 (SE)			
Municipalities including local authorities managing communal sections (CASEC and ASEC): Marigot, Belle-Anse and Anse-à-Pitre	Guidance, mainstreaming EBA and resilience	Members of the Regional Technical Advisory Group; development of management plans for Marine Managed Areas; involvement in adaptation measures and compliance to protect coral reefs, promote sustainable harvesting of in-shore fisheries; involvement in foreshore protection measures including revegetation and establishment of set back zones to control aggregate removal of corails and mangroves for construction and other uses; selection of sub-watersheds and micro-catchments for adaptation measures; municipal ordinances for compliance in liaison with ecosystems and landscapes protection and Marine Managed Area	Normal collaboration between Central Government and Municipalities and local authorities
Fondation Seguin	Services provider	Soils conservation, nurseries and tree planting, eco-tourism, education, payment for ecosystem services in the transect	Contractual services

Partner	Category of partners	Roles in Haiti/EBA/Resilience project implementation	Legal nature of the partnership
		Seguin-Baie d'Orange-Mare Briole- Callumette-	
Helvetas	Services provider	Collaboration with the project in co-management structures experiences for Protected areas, green infrastructures, land-use management tools, financial strategy for Protected areas	Soft agreement
CARE/AICF/WFP	Services provider	Vulnerability assessment, on-going training, availability of data on vulnerable groups, knowledge management	Soft agreement
SUCO	Services provider	Alternative livelihoods, resilient varieties of bananas to black sigatoka diseases, reforestation and watersheds management	Soft agreement
Service Chrétien d'Haiti	Services provider	Environmental education for teachers, governance, tree planting and food security initiatives; key member of the Haitian Civil Society Platform on Climate Change (See national scale)	Soft agreement
Solidaridad International	Services provider	Risk Disaster reduction, community resilience in Belle Anse	Soft agreement
Agro-Action Allemande and its partners including ACDED	Services provider	Local governance on resilience, environmental rehabilitation in Cascade Pichon/Belle-Anse, ecological restoration	Soft agreement
PADF	Services provider	Resilience actions (ravines protection and correction, soils conservation) in the transect of Seguin-Macary-Fonds Jean Noel- Péredo-Savanne du Bois	Soft agreement
Heart to Heart International	Services provider	Data base on local vulnerability	Soft agreement
Local fishermen associations including inter alia Fédération pour le Développement de la Pêche à Anse-à-Pitre, Association des Vendeurs de Poissons à Anse-à-Pitre	Local Resources users association and services provider	Community-Based fisheries management based on safeguard management and code of practices for fisheries strategic stocks (lobsters, conches etc) to protect reproduction zones and spawning grounds of fish species, to regulate sizes of catches, period of fishing to avoid to seize individuals in in period of reproduction (lobsters particularly), to regulate the number of fish engines; alternatives livelihoods	Contractual services with a grouping of fishermen associations
Local communities including inter alia Mouvement des	CBO's, Local development associations	Participatory management arrangements; active participation in livelihood demonstration projects	

Partner	Category of partners	Roles in Haiti/EBA/Resilience project implementation	Legal nature of the partnership
Jeunes Paysans de Cassédent, Association Paysans du Quartier de Seguin, Fédération des			
GEPLA	Service provider (Private development Operator)	Production of resilient crops	Possible contractual services

UNDP Support Services

368. UNDP will provide **Project Assurance**, supporting the Project Board Executive by carrying out objective and independent project oversight and monitoring functions.

Collaborative arrangements with related projects

369. The forms of collaboration that will be most crucial for the success of the project are shown in paragraphs 242-247.

Prior obligations and Prerequisites

N/A

Audit arrangements

370. The project will be audited in accordance with the UNDP Financial Rules and Regulations and applicable audit policies. The Government will provide the Resident Representative with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of UNDP (including GEF) funds according to the established procedures set out in the Programming and Finance manuals. The Audit will be conducted by a special and certified audit firm. UNDP will be responsible for making audit arrangements for the project in communication with the Project Implementing Partner. UNDP and the project Implementing Partner will provide audit management responses and the Project Manager and project support team will address audit recommendations. As a part of its oversight function, UNDP will conduct audit spot checks at least two times a year.

Communications and visibility requirements

371. Full compliance is required with UNDP's Branding Guidelines. These can be accessed at <http://intra.undp.org/coa/branding.shtml>, and specific guidelines on UNDP logo use can be accessed at: <http://intra.undp.org/branding/useOfLogo.html>. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects needs to be used. For the avoidance of any doubt, when logo use is required, the UNDP logo needs to be used alongside the GEF logo. The GEF logo can be accessed at: http://www.thegef.org/gef/GEF_logo. The UNDP logo can be accessed at <http://intra.undp.org/coa/branding.shtml>.

372. Full compliance is also required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"). The GEF Guidelines can be accessed at: http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf. Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.

373. Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied..

PART IV. MONITORING FRAMEWORK AND EVALUATION

374. The project will be monitored through the following M& E activities. The M& E budget is provided in the table below.

Project start:

375. A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

376. The Inception Workshop should address a number of key issues including:

- a) Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and RCU staff vis à vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
- b) Based on the project results framework and the relevant GEF Tracking Tool if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
- c) Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
- d) Discuss financial reporting procedures and obligations, and arrangements for annual audit.
- e) Plan and schedule Project Board meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following the inception workshop.

377. An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly:

- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).
- Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor issues, lessons learned etc... The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Annually:

- Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared by the Project Coordinator to monitor progress made since project start and in particular for the previous

reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

378. The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- AWP and other expenditure reports
- Risk and adaptive management
- ATLAS QPR
- Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

Periodic Monitoring through site visits:

379. UNDP CO and the UNDP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members.

Mid-term of project cycle:

380. The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation. The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Center (ERC).

381. The relevant GEF Focal Area Tracking Tools will also be completed during the mid-term evaluation cycle.

End of Project:

382. An independent Final Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF.

383. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC).

384. The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation.

385. During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Learning and knowledge sharing:

386. Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

387. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

388. Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

M& E workplan and budget

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team staff time</i>	Time frame
Inception Workshop and Report	<ul style="list-style-type: none"> Project Manager UNDP CO, UNDP GEF 	Indicative cost: \$3,000	Within first two months of project start up
Measurement of Means of Verification of project results.	<ul style="list-style-type: none"> UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members. 	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on <i>output and implementation</i>	<ul style="list-style-type: none"> Oversight by Project Manager Project team 	To be determined as part of the Annual Work Plan's preparation.	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	<ul style="list-style-type: none"> Project manager and team UNDP CO UNDP RTA UNDP EEG 	None	Annually
Periodic status/ progress reports	<ul style="list-style-type: none"> Project manager and team 	None	Quarterly
Mid-term Evaluation	<ul style="list-style-type: none"> Project manager and team UNDP CO UNDP RCU External Consultants (i.e. evaluation team) 	Indicative cost: 30,000	At the mid-point of project implementation.
Final Evaluation	<ul style="list-style-type: none"> Project manager and team, UNDP CO UNDP RCU External Consultants (i.e. evaluation team) 	Indicative cost : 30,000	At least three months before the end of project implementation
Project Terminal Report	<ul style="list-style-type: none"> Project manager and team 	0	At least three months

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team staff time</i>	Time frame
	<ul style="list-style-type: none"> UNDP CO local consultant 		before the end of the project
Audit	<ul style="list-style-type: none"> UNDP CO Project manager and team 	Indicative cost per year: 3,000	Yearly
Visits to field sites	<ul style="list-style-type: none"> UNDP CO UNDP RCU (as appropriate) Government representatives 	For GEF supported projects, paid from IA fees and operational budget	Yearly

Table 13. Impact Measurement Template

Key Impact Indicator	Target (Year 5)	Means of Verification	Sampling frequency	Location										
Extent of application of watershed management practices that contribute to CC resilience and to reducing upstream-downstream impacts	<div> Watershed management practices that contribute to CC resilience and to reducing upstream-downstream impacts are applied by 75% of the target households³⁸: <table> <tr> <th>Complex</th> <th>Households</th> </tr> <tr> <td>1 (NE)</td> <td>284,250</td> </tr> <tr> <td>2 (SW)</td> <td>12,600</td> </tr> <tr> <td>3 (SE)</td> <td>10,000 (subject to confirmation)</td> </tr> <tr> <td>Total</td> <td>306,850</td> </tr> </table> </div>	Complex	Households	1 (NE)	284,250	2 (SW)	12,600	3 (SE)	10,000 (subject to confirmation)	Total	306,850	Household surveys carried out in collaboration with partner institutions and projects in each zone	Yearly	Target watersheds
Complex	Households													
1 (NE)	284,250													
2 (SW)	12,600													
3 (SE)	10,000 (subject to confirmation)													
Total	306,850													
Areas of coastal and marine ecosystems (coral reefs, mangroves and sea grass beds) in the target complexes of importance for ecosystem-based adaptation to climate change	No loss of area of coral reef, mangroves or sea grass beds.	Field visits, diver surveys, overflights	Yearly	Target PAs										
Increased populations of fish on coral reefs, including herbivores of importance for maintaining the health of coral reefs	<div> Ranges of fish numbers per 100 m² in the three target complexes: <ul style="list-style-type: none"> - Grouper (>30cm): 1 - Nassau grouper: 0.25-0.5 - Grunts/margates: 1-2 - Snapper: 0.25 - Moray eels: 0.25 - Butterflyfish: 1 - Parrotfish (>20cm): 0.5 </div>	Reef surveys by divers	Yearly	Target PAs										

³⁸ The total numbers of target households give the value for CCA TT indicator 1 (Numbers of people who receive direct assistance aimed at reducing their vulnerability)

PART V. LEGAL CONTEXT

389. This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CPAP provisions apply to this document.

390. Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

391. The implementing partner shall:

- a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
- b) assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

392. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

393. The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via <http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

SECTION II: STRATEGIC RESULTS FRAMEWORK AND GEF INCREMENT

Vertical logic	Indicator	Baseline value	Target value	Means of verification	Risks										
Project Objective: Watersheds and coastal areas in Haiti are spatially configured and managed to increase the resilience of ecosystems and vulnerable communities to climate change and anthropic threats	0.1. Extent of application of watershed management practices that contribute to CC resilience and to reducing upstream-downstream impacts	Data from comparable areas suggest that approximately 50% of rural households (HH) typically employ Conservation Agriculture Practices ³⁹ on one or more of their plots, and approximately 40% of actively used fields have them in place ⁴⁰ , but without specific EBA benefits.	Watershed management practices that contribute to CC resilience and to reducing upstream-downstream impacts are applied by 75% of the target households ⁴¹ : <table><tr><td>Complex</td><td>Households</td></tr><tr><td>1 (NE)</td><td>284,250⁴²</td></tr><tr><td>2 (SW)</td><td>12,600⁴³</td></tr><tr><td>3 (SE)</td><td>10,000 (subject to confirmation)</td></tr><tr><td>Total</td><td>306,850</td></tr></table>	Complex	Households	1 (NE)	284,250 ⁴²	2 (SW)	12,600 ⁴³	3 (SE)	10,000 (subject to confirmation)	Total	306,850	Household surveys carried out in collaboration with partner institutions and projects in each zone	Delays in operations of partner projects through which target populations will be reached Climatic events out of coping range of resource management strategies Changes in economic conditions beyond coping range of NRM strategies
	Complex	Households													
1 (NE)	284,250 ⁴²														
2 (SW)	12,600 ⁴³														
3 (SE)	10,000 (subject to confirmation)														
Total	306,850														
	0.2. Areas of coastal and marine ecosystems (coral reefs, mangroves and sea grass beds) in the target complexes of importance for ecosystem-based adaptation to climate change	Current areas (ha) of coral reefs, mangroves and sea grass beds in the target complexes: - Coral reef: 4,801ha - Mangroves: 7,659ha - Sea grass: 24,140ha - Total priority ecosystems: 36,600ha Current annual rates of area loss ⁴⁴ : - Coral: 1.3-1.5% - Mangroves: 0.16%	No loss of area of coral reef, mangroves or sea grass beds.	Field visits, diver surveys, overflights	CC-related phenomena (e.g. coral bleaching, storm-related sediment runoff, sea level rise) outside of coping range of strategies										

³⁹ e.g. live barriers, hedgerows, rock barriers, rock walls, trash contour barriers, soil bunds or embryonic terraces, ravine barriers using wattle construction, contour canals. Under the baseline situation, these practices control erosion but do not contribute to CC resilience, for example by conserving moisture.

⁴⁰ These estimates are based on percentages found in a survey by Virginia Tech on the Central Plateau of Haiti, and will be validated at local level at project start

⁴¹ The total numbers of target households give the value for CCA TT indicator 1 (Numbers of people who receive direct assistance aimed at reducing their vulnerability)

⁴² 18,000 client households of USAID Avansé Project, 262,500 client households of the World Bank RESEPAG project and 3,750 client households of the IFAD PPI2 project (75% of the estimated client households of each partner project that coincide with the project target area)

⁴³ 75% of the client households of IFAD PPI3 project in the target area.

⁴⁴ Based on overall loss of mangroves in Haiti between 2000 and 2005 of 0.8% (<http://ftp.fao.org/docrep/fao/010/a1427e/a1427e07.pdf>), and estimated annual loss of coral in the Caribbean as a whole of 1.5% (Hodgson et al. 2002)

Vertical logic	Indicator	Baseline value	Target value	Means of verification	Risks
		- Sea grass beds: stable			
	0.3. Increased populations of fish on coral reefs, including herbivores of importance for maintaining the health of coral reefs	Ranges of fish numbers per 100 m ² in the three target complexes: <ul style="list-style-type: none"> - Grouper (>30cm): 0-0.25 - Nassau grouper: 0-0.25 - Grunts/margates: 0-1 - Snapper: 0 - Moray eels: 0 - Butterflyfish: 0-0.25 - Parrotfish (>20cm): 0-0.25 	Ranges of fish numbers per 100 m ² in the three target complexes: <ul style="list-style-type: none"> - Grouper (>30cm): 1 - Nassau grouper: 0.25-0.5 - Grunts/margates: 1-2 - Snapper: 0.25 - Moray eels: 0.25 - Butterflyfish: 1 - Parrotfish (>20cm): 0.5 	Reef surveys by divers	Delays in operations of partner projects through which alternative livelihoods will be provided Inadequate governance conditions in fishing communities Increased pressures on fisheries from external actors and initiatives
1. Increased resilience to climate threats in key watersheds and coastal ecosystems.	1.1. Improvements in climate change resilience among men and women in target communities, as measured by participatory assessments (e.g. IIED CRISTAL or Tear Fund methodologies, to be confirmed at project start)	Baseline to be determined through participatory assessments at project start	All target communities (see definition under indicator 0.1) report improved resilience among men and women relative to the without project situation	Participatory assessments (e.g. IIED CRISTAL or Tear Fund methodologies)	Delays in operations of partner projects through which alternative livelihoods will be provided CC, natural disasters and/or economic factors outside of coping ranges of resilience strategies
	1.2. Areas of ecosystems of critical importance for EBA that have been actively restored	Current areas (ha) of coral reefs, mangroves and sea grass beds in the target complexes: See Indicator 0.2	Additional areas established through investment in active restoration: <ul style="list-style-type: none"> - Mangrove restoration: 7ha (along 7km of coastline) - Gulley stabilization: 10.0km - Reforestation: 2,000ha 	Registers of restoration activities (directly financed by LDCF resources)	
	1.3. Degree of incorporation of	None of the Municipal and Departmental governments in the	All Municipal and Departmental governments in the target complexes	Review of zoning plans	Capacities and commitment of

Vertical logic	Indicator	Baseline value	Target value	Means of verification	Risks
	EBA/CC considerations and integrated landscape approach into planning instruments covering areas of importance for EBA and/or particularly vulnerable to CC	target complexes have spatial land use plans that incorporate EBA/CC considerations	have spatial land use plans that incorporate EBA/CC considerations		Municipal and Departmental Governments
2. Establishment and management of PAs in the marine and coastal zones of target watersheds	2.1. Increase in the coverage of priority coastal and marine ecosystems (coral reefs, mangroves and seagrass beds) that have been declared and gazetted as protected areas (marine managed areas)	Total area of coral reefs, mangroves and seagrass beds included in declared and gazetted PAs at present: Coral reefs: 1,503ha Mangroves: 5,559ha Sea grass beds: 8,640ha Other ecosystems: 25,030ha Total: 40,732ha	Total area of coral reefs, mangroves and seagrass beds included in declared and gazetted PAs at project end: 35,402ha Additional area included in PAs, by ecosystem: - Coral reef: 2,100ha - Mangroves: 2,100ha - Sea grass: 15,500ha - Total priority ecosystems: 19,700ha - Total all coastal/marine ecosystems: 37,300ha	Coordinates contained in PA declarations	Political support to the MMA concept Community support to the MMA concept
	2.2. Area covered by alternative management or protection categories providing for active integrated management and use	0ha: only one PA (Three Bays NP in Complex 1) has been established, without any internal zoning)	A total of 45,497ha out of 99,883ha of MMAs has been zoned for active management	PA management and zoning plans	Political support to the zoning proposals Community support to the zoning proposals
	2.3. Maintenance of income levels of fisher families (men and women) due to alternative livelihood opportunities and/or improvements in quality and value of fish caught and sold	Baseline to be determined during project through retrospective time line exercises	No fisher families in the target areas suffer reduced incomes as a result of project actions	Retrospective time line exercises in focus group meetings and/or household surveys	Delays in operations of partner projects through which alternative livelihoods will be provided Productivity of fisheries is undermined by external actors or

Vertical logic	Indicator	Baseline value		Target value		Means of verification	Risks															
							initiatives															
	2.4. Reductions in total threat levels affecting proposed coastal and marine PAs, as measured through the GEF Management Effectiveness Tracking Tool (METT)	<table><tr><th>Complex</th><th>Threat level</th></tr><tr><td>1 (NE)</td><td>67</td></tr><tr><td>2 (SW)</td><td>52</td></tr><tr><td>3 (SE)</td><td>53</td></tr></table>	Complex	Threat level	1 (NE)	67	2 (SW)	52	3 (SE)	53		<table><tr><th>Complex</th><th>Threat level*</th></tr><tr><td>1 (NE)</td><td>44</td></tr><tr><td>2 (SW)</td><td>29</td></tr><tr><td>3 (SE)</td><td>32</td></tr></table> See ProDoc annex for targets per METT variable	Complex	Threat level*	1 (NE)	44	2 (SW)	29	3 (SE)	32	METT workshops with PA managers	PAs are subjected to threats not targeted by the project
Complex	Threat level																					
1 (NE)	67																					
2 (SW)	52																					
3 (SE)	53																					
Complex	Threat level*																					
1 (NE)	44																					
2 (SW)	29																					
3 (SE)	32																					
	2.5. Management effectiveness rating of target PAs (including improvements in infrastructure and enforcement), measured through the GEF Management Effectiveness Tracking Tool (METT)	<table><tr><th>Complex</th><th>Management effectiveness rating</th></tr><tr><td>1 (NE)</td><td>10</td></tr><tr><td>2 (SW)</td><td>5</td></tr><tr><td>3 (SE)</td><td>5</td></tr></table>	Complex	Management effectiveness rating	1 (NE)	10	2 (SW)	5	3 (SE)	5		<table><tr><th>Complex</th><th>Management effectiveness rating*</th></tr><tr><td>1 (NE)</td><td>49</td></tr><tr><td>2 (SW)</td><td>48</td></tr><tr><td>3 (SE)</td><td>48</td></tr></table> *See ProDoc annex for targets per METT variable	Complex	Management effectiveness rating*	1 (NE)	49	2 (SW)	48	3 (SE)	48	METT workshops with PA managers	Inadequate regulatory and resource commitment by Government Inadequate buy-in by local communities
Complex	Management effectiveness rating																					
1 (NE)	10																					
2 (SW)	5																					
3 (SE)	5																					
Complex	Management effectiveness rating*																					
1 (NE)	49																					
2 (SW)	48																					
3 (SE)	48																					

Detail for Indicator O2: Baseline and target areas per complex of coral reef, mangroves and sea grass:

Ecosystem	Baseline				Target			
	1 NE	2 SW	3 SE	Total	1 NE	2 SW	3 SE	Total
Coral reef	1,503	2,000	1,298	4,801	No reduction			
Mangroves	5,559	2,050	50	7,659				
Sea grass	8,640	14,000	1,500	24,140				
Total	15,702	18,050	2,848	36,600				

Detail for Indicator O3: Baseline and target values per complex of numbers of fish/100m²

Fish type	Baseline			Target		
	1 NE	2 SW	3 SE	1 NE	2 SW	3 SE
Grouper (>30 cm)	0.25	0	0	1	1	1
Nassau Grouper	0.25	0	0	0.5	0.25	0.25
Grunts/margates	0	1	0.25	2	1	1
Snapper	0	0	0	0.25	0.25	0.25
Moray eels	0	0	0	0.25	0.25	0.25

Butterflyfish	0.25	0	0	1	1	1
Parrotfish (>20cm)	0.25	0	0.25	0.5	0.5	0.5

Detail for Indicator 1.2: Target values for areas (ha) established through active rehabilitation, by complex

	1 NE	2 SW	3 SE	Total
Coral	5.0	5.0	0.5	10.5
Mangroves	1.0	1.0	1.0	3.0
Seagrass	2.0	2.0	2.0	6.0
Gulleys (m)	4.0	2.0	4.0	10.0
Reforestation	250.0	500.0	500.0	1,250.0

Detail for Indicator 2.1: Baseline and target values for areas (ha) of ecosystems included in protected areas, by complex⁴⁵

Ecosystem	Baseline				Target			
	1 NE	2 SW	3 SE	Total	1 NE	2 SW	3 SE	Total
Coral reef	1,503	0	0	1,503	1,503	2,000	100	3,603
Mangroves	5,559	0	0	5,559	5,559	2,050	50	7,659
Sea grass	8,640	0	0	8,640	8,640	14,000	1,500	24,140
Others	25,030	0	0	25,030	59,916	31,421	8,854	100,191
Totals:	40,732	0	0	40,732	75,618	49,471	10,504	135,593

Detail for Indicator 2.2: Baseline and target values for areas (ha) covered by zoning categories providing for active integrated management

Ecosystem	Baseline				Target			
	1 NE	2 SW	3 SE	Total	1 NE	2 SW	3 SE	Total
Multiple use	0	0	0	0	6,063	0	0	6,063
Aquaculture	0	0	0	0	300	125	30	455.4
Tourism	0	0	0	0	13,110	14,942	200	28,252
No-Take Fisheries	0	0	0	0	4,647	1,464	2,298	8,409
Mangrove Conservation	0	0	0	0	1,714	600	3	2,317
Total management zones	0	0	0	0	25,834	17,131	2,531	45,496
Total MMA	0	0	0	0	40,372	49,471	9,680	99,883
Non-MMA area	75,618	0	0	75,618	35,246	0	0	35,246
Total PA	75,618	0	0	75,618	75,618	49,471	9,680	135,129

⁴⁵ The areas in Complex 1 are those of the proposed MMA inside the Three Bays National Park (the NP itself was declared before project start). The target areas in the other complexes refer to completely new proposed PAs.

SECTION III: TOTAL BUDGET AND WORKPLAN

Award ID:	00081100	Project ID(s):	00090545
Award Title:	Increasing resilience of ecosystems and vulnerable communities to CC and anthropic threats through a ridge to reef approach to BD conservation and watershed management		
Business Unit:	HT110		
Project Title:	Increasing resilience of ecosystems and vulnerable communities to CC and anthropic threats through a ridge to reef approach to BD conservation and watershed management		
PIMS N°:	4648		
Implementing Partner (Executing Agency)	Ministry of Environment		

GEF Outcome/ Atlas Activity	Responsible party	Fund ID / Donor Name	ERP/ATLAS Budget Description/ Input	Atlas Code	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Note
					US\$	US\$	US\$	US\$	US\$	US\$	
1. Increased resilience to climate threats in key watersheds and coastal ecosystems.	Ministry of Environment	62160 LDCF	International Consultants	71200	24,000	24,000	24,000	24,000	24,000	120,000	1
			Local Consultants	71300	96,715	96,715	96,715	96,715	96,715	483,575	2
			Contractual Services - Individual	71400	226,458	226,458	226,459	226,459	226,459	1,132,293	3
			Travel	71600	15,431	15,431	15,431	15,431	15,431	77,155	4
			Contractual services - companies	72100	20,000	20,000	20,000	20,000	20,000	100,000	5
			Equipment and Furniture	72200	214,352	0	0 0	0	0	214,352	6
			Materials and Goods	72300	12,500	12,500	12,500	12,500	12,500	62,500	7
			Supplies	72500	27,027	27,027	27,027	27,027	27,027	135,135	8
			Grants	72600	438,425	438,425	438,425	438,425	438,425	2,192,125	9
			Rental & Maintenance-Premises	73100	7,000	7,000	7,000	7,000	7,000	35,000	10
			Rental and Maintenance – other equipment	73400	4,710	4,710	4,710	4,710	4,710	23,550	11
			Training	75700	110,000	110,000	110,000	110,000	110,000	550,000	12
	LDCF Subtotal Outcome 1				1,196,618	982,266	982,267	982,267	982,267	5,125,685	
2. Establishment and	Ministry of Environment	62000 GEF TF	International Consultants	71200	34,000	34,000	34,000	0	0	102,000	13
			Local Consultants	71300	77,535	77,535	51,285	51,285	51,285	308,925	14

management of PAs in the marine and coastal zones of target watersheds.			Contractual Services - Individ	71400	202,390	202,390	202,390	202,390	202,390	1,011,950	15	
			Travel	71600	14,272	14,272	14,272	14,272	14,272	71,360	16	
			Contractual services - companies	72100	175,000	212,500	137,500	137,500	137,500	800,000	17	
			Equipment and Furniture	72200	164,650	0	0	0	0	164,650	18	
			Supplies	72500	18,018	18,018	18,018	18,018	18,018	90,090	19	
			Grants	72600	120,000	180,000	120,000	120,000	60,000	600,000	20	
			Rental & Maintenance-Premises	73100	5,000	5,000	5,000	5,000	5,000	25,000	21	
			Rental and Maintenance – other equipment	73400	3,140	3,140	3,140	3,140	3,140	15,700	22	
			Training	75700	76,941	76,941	76,941	76,941	76,941	384,705	23	
			GEF TF Subtotal Outcome 2				890,946	823,796	662,546	628,546	568,546	3,574,380
3. Project Management	UNDP	62160 LDCF	Contractual Services - Individ	71400	26,175	26,175	26,173	26,174	26,174	130,871	24	
			Travel	71600	80	80	6,700	80	6,700	13,640	25	
			Professional Services	74100	3,000	3,000	3,000	3,000	3,000	15,000	26	
			Direct Project Costs	74599	27,975	25,764	26,260	16,775		96,774	27	
		LDCF Subtotal Project Management				57,230	55,019	62,133	46,029	35,874	256,285	
		62000 GEF TF	International Consultants	71200	0	0	72,000	0	72,000	144,000	28	
			Direct Project Costs	74599	0	0	0	8,458	26,260	34,718	27	
		GEF TF Subtotal Project Management				0	0	72,000	8,458	98,260	178,718	
		GEF & LDCF Subtotal Project Management				57,230	55,019	134,133	54,487	134,134	435,003	
		TRAC	Contractual Services - Individ	71400	80,000	80,000	80,000	80,000	80,000	400,000		
		TRAC Subtotal Project Management				80,000	80,000	80,000	80,000	80,000	400,000	
		Total Project Management				137,230	135,019	214,133	134,487	214,134	835,003	
Totals by financing source		GEF TF			890,946	823,796	734,546	637,004	666,806	3,753,098		
		LDCF			1,253,848	1,037,285	1,044,400	1,028,296	1,018,141	5,381,970		
		TRAC			80,000	80,000	80,000	80,000	80,000	400,000		
Totals					2,224,794	1,941,081	1,858,946	1,745,300	1,764,947	9,535,068		

Budget summary

International Consultants	71200	58,000	58,000	130,000	24,000	96,000	366,000
Local Consultants	71300	174,250	174,250	148,000	148,000	148,000	792,500
Contractual Services - Individual	71400	455,023	455,023	455,022	455,023	455,023	2,275,114
Travel	71600	29,783	29,783	36,403	29,783	36,403	162,155
Contractual services - companies	72100	195,000	232,500	157,500	157,500	157,500	900,000
Equipment and Furniture	72200	379,002	-	-	-	-	379,002
Materials and goods	72300	12,500	12,500	12,500	12,500	12,500	62,500
Supplies	72500	45,045	45,045	45,045	45,045	45,045	225,225
Grants	72600	558,425	618,425	558,425	558,425	498,425	2,792,125
Rental and Maintenance - Premises	73100	12,000	12,000	12,000	12,000	12,000	60,000
Rental and Maintenance – other equipment	73400	7,850	7,850	7,850	7,850	7,850	39,250
Professional Services	74100	3,000	3,000	3,000	3,000	3,000	15,000
Direct Project Costs	74599	27,975	25,764	26,260	25,233	26,260	131,492
Training	75700	186,941	186,941	186,941	186,941	186,941	934,705
		2,144,794	1,861,081	1,778,946	1,665,300	1,684,947	9,135,068

Budget notes

Item	Budget code	Amount	Details
Component 1			
1	International Consultants	71200	120,000
			Specialist on EIA/SEA, environmental decision-making and territorial land use planning, to support the development of mechanisms for incorporating EBA-related environmental information into decision making and planning (outputs 1.1c ii and iii)
			International specialist on EBA/NRM, to support the generation of technical recommendations for NRM/EBA practices (output 1.2a) and ecosystem rehabilitation (output 1.3)
2	Local Consultants	71300	483,575
			Specialist to support the development and application of project strategies for supporting gender mainstreaming, stakeholder participation and the strengthening of community based organizations (cross-cutting, costs shared pro rata between Components 1 and 2)
			Specialist to support local and regional Governments in the incorporation of EBA considerations into territorial land use planning processes (output 1.1d)
			Environmental specialist to advise private sector actors on the development and application of measures to mitigate and/or offset their environmental impacts (output 1.1e)
			National specialist on EBA/NRM to support the application of NRM/EBA strategies (output 1.2a) and ecosystem rehabilitation (output 1.3) BACs
			3 facilitation consultants (1 per zone) to provide hands on technical and organisational support to local stakeholders and consolidate links between Government entities and local communities

Item	Budget code		Amount	Details
				M&E consultant to support the development and implementation of the project M&E system, including BD and threats status, and PA effectiveness(pro rata Components 1 and 2).
3	Contractual Services - Individual	71400	1,132,293	Full time project coordinator (costs divided pro rata between Components 1 and 2, and Project Management)
				Full time EBA/NRM specialist to advise on and facilitate all aspects of Component 1
				Full time M&E specialist to support the development and implementation of the project M&E system.
				3 full time EBA/NRM specialists (one per target zone) to facilitate field-level actions under Component 1
				Logistical support staff in central and regional offices (costs divided pro rata between Components 1 and 2, and Project Management)
4	Travel	71600	77,155	DSA and plane tickets for travel by project coordinator and specialists to project sites
5	Contractual services - companies	72100	100,000	Contract with national NGO/PDO for the formulation and implementation of a public awareness and environmental education campaign on CC resilience, EBA and watershed management
6	Equipment and Furniture	72200	214,352	4WD vehicles to enable the project staff to operate in the target watersheds (one per target complex and one at central level, divided pro rata between Components 1 and 2 and Project Management)
				Motorcycles to enable the project staff to operate in the target watersheds (three per target complex , divided pro rata between Components 1 and 2)
				Office furniture and equipment (including computers and printers) in three regional offices and central office, divided pro rata between Components 1 and 2 and Project Management
7	Materials and goods	72300	62,500	Seeds and planting materials for reforestation and restoration activities.
8	Supplies	72500	135,135	Fuel for 4WD vehicles in target complexes (pro rata)
				Office supplies for regional offices in three target complexes (pro rata)
9	Grants	72600	2,192,125	Grants to local communities for rehabilitating ecosystems in order to promote CC resilience (mangrove planting, coral nurseries, gully stabilisation, windbreak planting)
10	Rental and Maintenance - Premises	73100	35,000	Rent of regional offices in the three target complexes (pro rata)
11	Rental and Maintenance - other equipment	73400	23,550	Vehicle maintenance
12	Training	75700	550,000	Training workshops, field schools and training materials for the promotion of good EBA, NRM and watershed management practices
		Total	5,125,685	
	Component 2			
13	International	71200	102,000	International PA/BD specialist to support the formulation of

Item	Budget code		Amount	Details
	Consultants			proposals for PA design and management in the target areas (outputs 2.1a, 2.1b and 2.2)
				International PA finance specialist to advise on the implementation of the PA financing strategy (output 2.2d)
				International fisheries specialist to carry out evaluation of FAD impacts and design monitoring system for fish populations (output 2.1c)
				International marine biologist to support the inclusion of marine biology and coastal/marine BD management into higher education programmes (output 2.2f)
14	Local Consultants	71300	308,925	Specialist to support the development and application of project strategies for supporting gender mainstreaming, stakeholder participation and the strengthening of community based organizations (cross-cutting, costs shared pro rata between Components 1 and 2)
				Consultant to support legal aspects of PA declaration
				3 facilitation consultants (1 per zone) to facilitate provide hands on technical and organisational support to local stakeholders and consolidate links between Government entities and local communities
				M&E consultant to support the development and implementation of the project M&E system, including BD and threats status, and PA effectiveness (pro rata Components 1 and 2).
15	Contractual Services - Individ	71400	1,011,950	Full time project coordinator (costs divided pro rata between Components 1 and 2, and Project Management)
				Full time PA/BD specialist to advise on and facilitate all aspects of Component 2
				3 full time PA/BD specialists (one per target zone) to facilitate field-level actions under Component 2
				Logistical support staff in central and regional offices (costs divided pro rata between Components 1 and 2, and Project Management)
16	Travel	71600	71,360	DSA and plane tickets for travel by project coordinator and specialists to project sites
17	Contractual services - companies	72100	800,000	Contract with national NGO/PDO to develop and implement environmental awareness and education campaigns on coastal and marine BD and ecosystems, and their importance for livelihoods and resilience
				Contracts with national NGOs/PDOs to facilitate processes in support of the design, declaration and management of PAs in the three target areas, including the negotiation of limits, zoning and management strategies with local communities and the development of natural resource/fisheries governance structures and norms (outputs 2.1 and 2.2).
				Contracts with national NGOs/OPDs to carry out baseline surveys of proposed PAs in all three target zones, covering biological, fisheries and socioeconomic aspects (output 2.1c)
				Contracts with national NGOs/OPDs to design and implement biological and fisheries monitoring systems for PAs in all three target zones
18	Equipment	72200	164,650	4WD vehicles to enable the project staff to operate in the target

Item	Budget code		Amount	Details
	and Furniture			watersheds (one per target complex and one at central level, divided pro rata between Components 1 and 2 and Project Management)
				Motorcycles to enable the project staff to operate in the target watersheds (three per target complex , divided pro rata between Components 1 and 2)
				Boats (1 per complex) to enable project team to operate in offshore areas
				Office furniture and equipment (including computers and printers) in three regional offices and central office, divided pro rata between Components 1 and 2 and Project Management
19	Supplies	72500	90,090	Fuel for 4WD vehicles in target complexes (pro rata)
				Office supplies for regional offices in three target complexes (pro rata)
20	Grants	72600	600,000	Establishment and/or improvement of PA offices and municipal governments in all three target zones (computers, surveillance equipment, uniforms etc.) in order to strengthen PA management capacity in parallel with increased staff assignation by MDE (output 2.2)
				Grants to local communities/organisations to cover the costs of community-based facilitation of governance processes, environmental education and livelihood development, including small-scale seed funding for enterprises such as plastic recycling businesses
21	Rental and Maintenance - Premises	73100	25,000	Rent of regional offices in the three target complexes (pro rata)
22	Rental and Maintenance – other equipment	73400	15,700	Vehicle maintenance
23	Training	75700	384,705	Workshops and training materials for the promotion of fisheries governance, PA planning and alternative livelihood practices
		Total	3,574,380	
Project Management				
24	Contractual Services - Individ	71400	130,871	Full time project coordinator (costs divided pro rata between Components 1 and 2, and Project Management)
				Logistical support staff in central and regional offices (costs divided pro rata between Components 1 and 2, and Project Management)
25	Travel	71600	13,640	National and international travel for external evaluators
26	Professional Services	74100	15,000	Audit costs
27	Direct Project Costs	74599	131,492	Estimated UNDP Direct Project Service/Cost recovery charges to UNDP for executing services. In accordance with GEF Council requirements, the costs of these services will be part of the executing entity's Project Management Cost allocation identified in the project budget. DPS costs would be charged at the end of each year based on the UNDP Universal Price List (UPL) or the actual corresponding service cost. The amounts here are estimations based

Item	Budget code		Amount	Details
				on the services indicated, however as part of annual project operational planning the DPS to be requested during the calendar year would be defined and the amount included in the yearly project management budgets and would be charged based on actual services provided at the end of that year.
28	International Consultants	71200	144,000	International consultants for external evaluations at mid term and end.
		Total	435,003	

SECTION IV: ADDITIONAL INFORMATION

PART I. Endorsement Letter



RÉPUBLIQUE D'HAÏTI

MINISTÈRE DE L'ENVIRONNEMENT

MDE/JFT/BM-mjva/PNUD/013250

11 Avril 2013

Port-au-Prince, le

Ms. Adriana Dinu
Officier en Charge au PNUD-GEF et Coordonnateur Exécutif Adjoint
Programme des Nations Unies pour le Développement
304 East 45th Street, 9th Floor
New York City, NY 10017, USA
Fax: +1 (212) 906-6998

Objet : Endossement pour « l'Augmentation de la résilience des écosystèmes et des communautés vulnérables aux changements climatiques et aux menaces anthropiques par l'approche « de la montagne à la mer » en vue de la conservation de la biodiversité et de la gestion des bassins versants »

En ma qualité de Point Focal Opérationnel du Fonds pour l'Environnement Mondial (GEF), je précise que la proposition de projet citée dans l'objet est en adéquation avec les priorités nationales du Gouvernement de la République d'Haïti et en conformité à ses engagements en matière de conventions environnementales internationales. Cette proposition a été discutée avec les parties prenantes, incluant les Points Focaux des Conventions Environnementales Nationales.

J'ai le plaisir d'endosser la préparation de ladite proposition de projet avec l'appui du Programme des Nations Unies pour le Développement (PNUD). Si cette proposition est approuvée, sa préparation et son implémentation seront assurées par le PNUD. Je demande à ce que le document de projet soit élaboré conjointement avec le Ministère de l'Environnement haïtien qui le validera avant qu'il soit soumis au Secrétariat du GEF pour l'endossement par le Secrétaire Exécutif en Chef (CEO).

Les ressources totales requises du GEF pour le financement du projet s'élèvent à dix millions deux cent mille (10,200,000) dollars américains (US\$), incluant la subvention pour la préparation du projet, le cas échéant, et les frais d'agence pour les services de gestion du cycle de projet associés à la subvention totale du GEF. Ces ressources sont réparties de la façon suivante :

Source de Fonds	Agence du GEF	Domaine Focal	Montant (en US\$)			
			Préparation du Projet	Implémentation du Projet	Frais d'Agence	Total
LDCF	PNUD	CCA	97,482	5,381,970	520,548	6,000,000
GEFTF	PNUD	BD	82,518	3,753,098	364,384	4,200,000
Ressources Totales du GEF			180,000	9,135,068	884,932	10,200,000

Je consens d'utiliser les ressources allouées à Haïti dans le GEF-5 tel que défini dans le Système Transparent d'Allocation des Ressources (STAR).

Veuillez agréer, Madame, mes salutations distinguées.


Dr Jean François THOMAS
Ministre
Point Focal Opérationnel du GEF


CC: Daniel Brisard, Point Focal de la Convention Cadre des Nations Unies sur les Changements Climatiques ; Martine Elisabeth Matthieu, Point Focal de la Convention sur la Diversité Biologique.

PART II. Target values for METT scores per PA complex

Management Rating	Baseline management ratings by complex			Target management ratings by complex			Actions proposed to improve METT rating
	1 (NE)	2 (SW)	3 (SE)	1 (NE)	2 (SW)	3 (SE)	
1. Legal status: Does the protected area have legal status (or in the case of private reserves is covered by a covenant or similar)?	3	-	-	3	3	3	Formally declare the MMA
2. Protected area regulations: Are appropriate regulations in place to control area use and activities (e.g. fishing)?	1	-	-	2	2	2	Draft and approve laws and regulations for management
3. Law Enforcement: Can staff (i.e. those with responsibility for managing the site) enforce protected area rules well enough?	-	-	-	1	1	1	Hire staff and train them in appropriate law enforcement methods
4. Protected area objectives: Is management undertaken according to agreed objectives?	-	-	-	2	2	2	Managers will be trained to follow management plan
5. Protected area design: Is the protected area the right size and shape to protect species, habitats, ecological processes and water catchments of key conservation concern?	3	3	3	3	3	3	
6. Protected area boundary demarcation: Is the boundary known and demarcated?	1	-	-	2	1	1	Boundaries will be marked on maps, on land and in the sea.
7. Management plan: Is there a management plan and is it being implemented?	-	-	-	1	1	1	Management plan will be drafted and implemented
7.a Planning process: The planning process allows adequate opportunity for key stakeholders to influence the management plan	1	1	1	1	1	1	Participatory management will be used to engage stakeholders in the management process.
7.b Planning process: There is an established schedule and process for periodic review and updating of the management plan	-	-	-	1	1	1	Will establish a planning process that is adaptive.
7.c Planning process: The results of monitoring, research and evaluation are routinely incorporated into planning	-	-	-	1	1	1	Will implement M & E plan that is used to feed planning.
8. Regular work plan: Is there a regular work plan and is it being implemented	-	-	-	1	1	1	A regular work plan will be created to allow all activities to be accomplished on

Management Rating	Baseline management ratings by complex			Target management ratings by complex			Actions proposed to improve METT rating
	1 (NE)	2 (SW)	3 (SE)	1 (NE)	2 (SW)	3 (SE)	
							schedule
9. Resource inventory: Do you have enough information to manage the area?	-	-	-	1	1	1	A resource inventory will be created that fill gaps in existing information, corrects and updates old information.
10. Protection systems: Are systems in place to control access/resource use in the protected area?	-	-	-	1	1	1	A system of resource management will be established that includes protection.
11. Research: Is there a programme of management-orientated survey and research work?	-	-	-	1	1	1	A regular program of reseach will be implemented to monitor and update the status of natural resources in the area.
12. Resource management: Is active resource management being undertaken?	-	-	-	1	1	1	Active resource management will be organized using the tools in the management plan.
13. Staff numbers: Are there enough people employed to manage the protected area?	-	-	-	1	1	1	Sufficient staff will be employed by government, private/public partnerships, and NGOs to carry out the work plan.
14. Staff training: Are staff adequately trained to fulfill management objectives?	-	-	-	1	1	1	Staff will be trained sufficiently to fulfill management objectives
15. Current budget: Is the current budget sufficient?	-	-	-	1	1	1	The planned current budget will be sufficient to carry out the MMA management plan.
16. Security of budget: Is the budget secure?	-	-	-	1	1	1	The planned budget will be secured from all expected sources through written plans and agreements.

	Baseline management ratings by complex			Target management ratings by complex			Actions proposed to improve METT rating
Management Rating	1 (NE)	2 (SW)	3 (SE)	1 (NE)	2 (SW)	3 (SE)	
17. Management of budget: Is the budget managed to meet critical management needs?	-	-	-	1	1	1	The budget will be managed through oversight by financial controllers and the director.
18. Equipment: Is equipment sufficient for management needs?	-	-	-	1	1	1	Sufficient equipment will be obtained/purchased so that the management plan can be achieved.
19. Maintenance of equipment: Is equipment adequately maintained?	-	-	-	1	1	1	Equipment will be maintained in good condition so that the management plan can be implemented.
20. Education and awareness: Is there a planned education programme linked to the objectives and needs?	-	-	-	1	1	1	An education program for kids, adults and new staff will be developed that is closely linked to the objectives of the project
21. Planning for land, sea and fresh water use: Does land and water use planning recognise the protected area and aid the achievement of objectives?	-	-	-	1	1	1	Land, sea and water use will be planned to allow implementation of the MMA
21a. Land and water planning for habitat conservation: Planning and management in the catchment or landscape containing the protected area incorporates provision for adequate environmental conditions (e.g. volume, quality and timing of water flow, air pollution levels etc) to sustain relevant habitats.	-	-	-	1	1	1	Planning and management in the catchments will include tracking environmental conditions to ensure delivery of objectives.
21b. Land and water planning for habitat conservation: Management of corridors linking the protected area provides for wildlife passage to key habitats outside the protected area (e.g. to allow migratory fish to travel between freshwater spawning sites and the sea, or to allow animal migration).	-	-	-	1	1	1	Migratory corridors will be maintained for all life stages adequate so that program objectives can be met.

Management Rating	Baseline management ratings by complex			Target management ratings by complex			Actions proposed to improve METT rating
	1 (NE)	2 (SW)	3 (SE)	1 (NE)	2 (SW)	3 (SE)	
21c. Land and water planning for habitat conservation: "Planning addresses ecosystem-specific needs and/or the needs of particular species of concern at an ecosystem scale (e.g. volume, quality and timing of freshwater flow to sustain particular species, fire management to maintain savannah habitats etc.)"	-	-	-	1	1	1	Ecosystem specific needs for species of concern will be met.
22. State and commercial neighbours: Is there co-operation with adjacent land and water users?	-	-	-	1	1	1	Efforts will be made to include neighbors in planning and management.
23. Indigenous people: Do indigenous and traditional peoples resident or regularly using the protected area have input to management decisions?	-	-	-	1	1	1	Local people will be engaged in the management process but there are no special "indigenous" groups per se because Columbus killed them all.
24. Local communities: Do local communities resident or near the protected area have input to management decisions?	-	-	-	1	1	1	Local communities will be included in management decision making.
24 a. Impact on communities: There is open communication and trust between local and/or indigenous people, stakeholders and protected area managers	-	-	-	1	1	1	Participatory management will be used to engage stakeholders in the management process.
24 b. Impact on communities: Programmes to enhance community welfare, while conserving protected area resources, are being implemented	-	-	-	1	1	1	job creation, training and other initiatives will be implemented to help improve economic conditions in local communities.
24 c. Impact on communities: Local and/or indigenous people actively support the protected area	-	-	-	1	1	1	Participatory management will be used to engage stakeholders in the management process.
25. Economic benefit: Is the protected area providing economic benefits to local communities, e.g. income, employment, payment for environmental services?	-	-	-	1	1	1	job creation, training and other initiatives will be implemented to help improve economic conditions in local communities.

Management Rating	Baseline management ratings by complex			Target management ratings by complex			Actions proposed to improve METT rating
	1 (NE)	2 (SW)	3 (SE)	1 (NE)	2 (SW)	3 (SE)	
26. Monitoring and evaluation: Are management activities monitored against performance?	-	-	-	1	1	1	M & E program will be used for adaptive management.
27. Visitor facilities: Are visitor facilities adequate?	-	-	-	1	1	1	Visitor facilities will be built.
28. Commercial tourism operators: Do commercial tour operators contribute to protected area management?	-	-	-	1	1	1	Commercial tour operators will be included in the planning process where it benefits the MMA.
29. Fees: If fees (i.e. entry fees or fines) are applied, do they help protected area management?	-	-	-	1	1	1	Entry fees will be established as needed to help defray the costs of MMA operation.
30. Condition of values: What is the condition of the important values of the protected area as compared to when it was first designated?	1	1	1	1	1	1	The condition of important values of the MMA will be improved as listed in the project targets.
30a: Condition of values: The assessment of the condition of values is based on research and/or monitoring	-	-	-	1	1	1	Research and monitoring will be used to assess conditions of the values.
30b: Condition of values Specific management programmes are being implemented to address threats to biodiversity, ecological and cultural values	-	-	-	1	1	1	Management programs will be defined to address threats to biodiversity, ecological and cultural values.
30c: Condition of values: Activities to maintain key biodiversity, ecological and cultural values are a routine part of park management	-	-	-	1	1	1	One standard activity is to maintain key biodiversity, ecological and cultural values.
TOTAL SCORE	10	5	5	49	48	48	

PART III. Baseline and target scores for threat reduction in target PAs (based on METT scorecard)

	Baseline threat ratings by complex			Target threat ratings by complex			Strategy resulting in threat reduction
Threat	1 (NE)	2 (SW)	3 (SE)	1 (NE)	2 (SW)	3 (SE)	
1. Residential and commercial development within a protected area							
Threats from human settlements or other non-agricultural land uses with a substantial footprint							
1.1 Housing and settlement	2	1	1	2	1	1	
1.2 Commercial and industrial areas	2	-	-	2	0	0	
1.3 Tourism and recreation infrastructure	1	1	1	1	1	1	
2. Agriculture and aquaculture within a protected area							
Threats from farming and grazing as a result of agricultural expansion and intensification, including silviculture, mariculture and aquaculture							
2.1 Annual and perennial non-timber crop cultivation	2	-	-	1	0	0	Training programs will alleviate this issue
2.1a Drug cultivation	-	-	-	0	0	0	
2.2 Wood and pulp plantations	-	-	-	0	0	0	
2.3 Livestock farming and grazing	2	1	1	1	0	0	Training programs will alleviate this issue
2.4 Marine and freshwater aquaculture	-	-	-	0	0	0	
3. Energy production and mining within a protected area							
Threats from production of non-biological resources							
3.1 Oil and gas drilling	-	-	-	0	0	0	
3.2 Mining and quarrying	1	-	1	1	0	1	
3.3 Energy generation, including from hydropower dams	1	-	-	1	0	0	
4. Transportation and service corridors within a protected area							
Threats from long narrow transport corridors and the vehicles that use them including associated wildlife mortality							

Threat	Baseline threat ratings by complex			Target threat ratings by complex			Strategy resulting in threat reduction
	1 (NE)	2 (SW)	3 (SE)	1 (NE)	2 (SW)	3 (SE)	
4.1 Roads and railroads (include road-killed animals)	1	1	1	1	1	1	
4.2 Utility and service lines (e.g. electricity cables, telephone lines,)	1	-	-	1	0	0	
4.3 Shipping lanes and canals	1	-	-	1	0	0	
4.4 Flight paths	-	-	-	0	0	0	
5. Biological resource use and harm within a protected area							
Threats from consumptive use of "wild" biological resources including both deliberate and unintentional harvesting effects; also persecution or control of specific species (note this includes hunting and killing of animals)							
5.1 Hunting, killing and collecting terrestrial animals (including killing of animals as a result of human/wildlife conflict)	2	2	2	1	1	1	Participatory management and alternative livelihoods
5.2 Gathering terrestrial plants or plant products (non-timber)	2	2	2	1	1	1	Participatory management and alternative livelihoods
5.3 Logging and wood harvesting	3	3	3	1	1	1	Participatory management and alternative livelihoods
5.4 Fishing, killing and harvesting aquatic resources	3	3	3	1	1	1	Participatory management, zoning and alternative livelihoods
6. Human intrusions and disturbance within a protected area							
Threats from human activities that alter, destroy or disturb habitats and species associated with non-consumptive uses of biological resources							
6.1 Recreational activities and tourism	1	1	1	0	0	0	Co-management with tourism
6.2 War, civil unrest and military exercises	-	-	-	0	0	0	
6.3 Research, education and other work-related activities in protected areas	1	1	1	0	0	0	With management in place, this will reduce problems due to careful oversight.
6.4 Activities of protected area managers (e.g. construction or vehicle use, artificial watering points and dams)	-	-	-	0	0	0	
6.5 Deliberate vandalism, destructive activities or threats to protected area staff and visitors	1	-	-	1	0	0	
7. Natural system modifications							

	Baseline threat ratings by complex			Target threat ratings by complex			Strategy resulting in threat reduction
Threat	1 (NE)	2 (SW)	3 (SE)	1 (NE)	2 (SW)	3 (SE)	
Threats from other actions that convert or degrade habitat or change the way the ecosystem functions							
7.1 Fire and fire suppression (including arson)	1	1	1	1	1	1	Participatory management and alternative livelihoods
7.2 Dams, hydrological modification and water management/use	-	-	-	0	0	0	
7.3a Increased fragmentation within protected area	2	1	1	1	0	0	Zoning, education and PR work should reduce this threat
7.3b Isolation from other natural habitat (e.g. deforestation, dams without effective aquatic wildlife passages)	1	1	1	1	0	0	Zoning, education, PR and participatory management should reduce this threat in the SE and SW but given the level of development in NE will not be so effective.
7.3c Other ‘edge effects’ on park values	-	-	-	0	0	0	
7.3d Loss of keystone species (e.g. top predators, pollinators etc)	3	3	3	1	1	1	Zoning, education, PR and better management
8. Invasive and other problematic species and genes							
Threats from terrestrial and aquatic non-native and native plants, animals, pathogens/microbes or genetic materials that have or are predicted to have harmful effects on biodiversity following introduction, spread and/or increase							
8.1 Invasive non-native/alien plants (weeds)	2	2	2	1	1	1	May be able to restore some native habitat
8.1a Invasive non-native/alien animals	3	3	3	3	3	3	
8.1b Pathogens (non-native or native but creating new/increased problems)	-	-	-	0	0	0	
8.2 Introduced genetic material (e.g. genetically modified organisms)	-	-	-	0	0	0	
9. Pollution entering or generated within protected area							
Threats from introduction of exotic and/or excess materials or energy from point and non-point sources							
9.1 Household sewage and urban waste water	2	1	1				

Threat	Baseline threat ratings by complex			Target threat ratings by complex			Strategy resulting in threat reduction
	1 (NE)	2 (SW)	3 (SE)	1 (NE)	2 (SW)	3 (SE)	
9.1a Sewage and waste water from protected area facilities (e.g. toilets, hotels etc)	-	-	-	0	0	0	
9.2 Industrial, mining and military effluents and discharges (e.g. poor water quality discharge from dams, e.g. unnatural temperatures, de-oxygenated, other pollution)	1	-	-	0	0	0	Will be able to work with mining and industrial point sources to reduce this threat as part of the park management plan.
9.3 Agricultural and forestry effluents (e.g. excess fertilizers or pesticides)	2	1	1	1	0	1	Can reduce with education and training
9.4 Garbage and solid waste	1	1	1				Can reduce with education and training and recycling
9.5 Air-borne pollutants	-	-	-	0	0	0	
9.6 Excess energy (e.g. heat pollution, lights etc)	-	-	-	0	0	0	
10. Geological events							
Geological events may be part of natural disturbance regimes in many ecosystems. But they can be a threat if a species or habitat is damaged and has lost its resilience and is vulnerable to disturbance. Management capacity to respond to some of these changes may be limited.							
10.1 Volcanoes	-	-	-	0	0	0	
10.2 Earthquakes/Tsunamis	2	2	2	1	1	1	Can reduce the threat from tsunami by mangrove and coral reef restoration
10.3 Avalanches/ Landslides	2	2	2	2	2	2	
10.4 Erosion and siltation/ deposition (e.g. shoreline or riverbed changes)	3	3	3	2	2	3	Can reduce the threat from upland erosion by active soil conservation measures in NE and SW but not in SE as most erosion is from the shoreline.
11. Climate change and severe weather							
Threats from long-term climatic changes which may be linked to global warming and other severe climatic/weather events outside of the natural range of variation							

Threat	Baseline threat ratings by complex			Target threat ratings by complex			Strategy resulting in threat reduction
	1 (NE)	2 (SW)	3 (SE)	1 (NE)	2 (SW)	3 (SE)	
11.1 Habitat shifting and alteration	2	3	3	1	2	2	Can reduce with education and training and soil conservation
11.2 Droughts	2	3	3	2	3	3	
11.3 Temperature extremes	2	3	3	3	3	3	
11.4 Storms and flooding	2	3	3	1	2	2	Zoning, education, PR and participatory management, soil conservation measures should reduce this threat.
12. Specific cultural and social threats							
12.1 Loss of cultural links, traditional knowledge and/or management practices	2	1	1	2	1	1	A cultural focus on tourism can help reduce this threat
12.2 Natural deterioration of important cultural site values	2	1	1	2	0	0	A cultural focus on tourism can help reduce this threat
12.3 Destruction of cultural heritage buildings, gardens, sites etc	3	1	1	2	0	0	A cultural focus on tourism can help reduce this threat
Totals	67	52	53	44	29	32	

PART IV. List of community-based organizations that participated in PPG consultation workshops

Sud-Est

Commune Seguin/Marigot

No.	Sigles des Organisations	Nom de l'Organisation
1	APKB	Association des Planteurs de Kafe-Bery
2	OFVS	Organisation des Femmes Vaillantes de Seguin
3	MJPK	Mouvement des Jeunes Paysans de Kasedan
4	OJMADSE	Organisation des Jeunes de Mabriole en Action pour le Développement du Sud'Est
5	RFDB	Rassemblement des Femmes Engagées de Bedorany (En créole: Rasanbleman Fanm Deside Bedorany)
6	AJPM KPPPL	Association des Jeunes Paysans de Macari-Kasedan Pour la Protection du Parc La Visite
7	OPAHDES	Organisation des Patriotes pour le Développement de SIDES
8	RPB	Rassemblement Paysans de Bedorany
9	FODKS	Fédération des Organisations pour le Développement du Quartier de Seguin
10	APBI	Association Paysans Bas-Idayi
11	APKS	Association Paysans Quatier Seguin (Assosyation Peyizan Katye Segen)
12	ALINA	Association Libérale Nationale

Nord-Est

Commune Trou du Nord

No.	Sigles des Organisations	Nom de l'Organisation
1	UJIRECT	Union des jeunes pour le développement et la reforestation de Trou du Nord
2	GRADD	Groupe de Recherche et D'appui en développement durable
3	KADEJ	Konbit Agrikol pou devlopman Jilwo
4	OJDER	Organisation des jeunes pour le développement et l'éducation de roche plate
5	OPDD	Organisation paysanne pour le développement de Dumolle
6	RAJEPT	Rassemblement des jeunes pour le progrès de trou du Nord
7	FOPADET	Force Patriotique Agricole pour le Développement de Trou du Nord
8	MPW	Mouvement des paysans de Woukou
9	OJPDT	Organisation des jeunes Penseurs pour le Développement de Trou Du Nord
10	OPTÉP	Organisation des Paysans Tête-Ensemble de Pichon
11	COOPATNO	Coopération pour le Développement de Trou du Nord
12	ASSAGAT	Association des Agriculteurs Actifs de Trou du Nord
13	REFADEN	Réseau des Femmes Actives pour le Développement de Trou Du Nord.
14	KOFADET	Rassemblement des Femmes pour le Développement du Nord (Konbit fanm pour Devlopman Trou-du-Nord)
15	RAFNE	Rassemblement des Femmes du Nord-Est (Rasanbleman fanm Nòdès)

	Sud	
	Commune Barradères	
No.	Sigles des Organisations	Nom de l'Organisation
1	ODLJ Tête d'Eau	
2	ODERB	Organisation de Développement et d'Exploitation des Ressources des Baradères
3	MCNH	Mouvement Conciliation des Haïtiens pour le Développement
4	OHPEN	Organisation des Hommes Progressistes pour l'Epanouissement des Nippes
5	MDJVB	
6	TAAPEB	Tête Ensemble, Association des Pêcheurs des Baradères
7	MCYH	
8	MPFCB	
9	OPAJEB	
10	WOB/ROB	
11	SOPEPB	Solidarité des Pêcheurs Professionnels des Baradères
12	UPDB	Union des Pêcheurs pour le Développement des Baradères (Inyon Pechè pou Devlopman Baradères)
13	APAGB	Association des Pêcheurs pour l'Avancement de Grand-Boukan
14	RAMAD	Rassemblement des Marchands pour le Développement de Digoterie
15	APA-5	Association des Pêcheurs pour l'Avancement de 5ème Section

Sud-Est

Commune Belle-Anse

No.	Sigles des Organisations	Nom de l'Organisation
1	APB	Association des pêcheurs de Belle-Anse
2	APPAB	Association des pêcheurs progressistes pour l'avancement de Belle-Anse
3	APIB	Association des pêcheurs intégrés de Belle-Anse
4	APBC	Association des pêcheurs de Bas Corail
5	GASPEB	Groupe d'action secours pêcheurs de Belle-Anse
6	APPM	Organisation pêcheurs pêche Moray
7	APAF	Association des pêcheurs Fatima Anse à Bœuf
8	APK	Association Pêcheurs de Calimette
9	APKB	Association des pêcheurs Ka madanm de baie d'Orange
10	AASDB	Association d'armateurs des scènes détruites de Belle-Anse
11	SODAP	Solidarité pour le développement de Belle-Anse
12	CODEPAB	Coordination du développement de la pêche dans l'arrondissement de Belle-Anse
13	CCPM	Centre communale pêche maritime

Grande-Anse

Commune Pestel

No.	Sigles des Organisations	Nom de l'Organisation
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1	APC	Association des Pêcheurs de Cassavon
2	GFVP	Groupeement des Femmes Engagées de Pestel (Groupeement Fanm Vanyan Pestel)
3	APAD	Association des Pêcheurs de Anse-du-Nord
4	MODPSIC	Mouvement pour le Développement Zilé Pointe-Sable et îles Cayemites
5	AJPPCS	Asociation des Jeunes Pêcheurs de Pointe-Sable et Cayemites
6	ASPA	Association des Pecheurs de Anse-à-Maçon
7	MPCP	Mouvement des Paysans de la Commune de Pestel (Mouvman Peyizan Komin Pestel)
8	APP	Association des Pêcheurs de Pestel
9	APS	Association des Pêcheurs de Source
10	APHE	Association des Pêcheurs de Herbe-Ginen
11	APB	Association des Pêcheurs de Basses

Nord-Est

Commune Caracol

No.	Sigles des Organisations	Nom de l'Organisation
1	APKDP	Assocaition des pêcheurs de caracol pour le developpemnt de la Pêche
2	BMA	Brigadiers maritimes en action
3	RAFAK	Rassemblement fanm karakol
4	MOFEK	Mouvement des Femmes-Espoir de Caracol
5	APK	Association des Pêcheurs de Caracole (Asosyasyon Pechè Karakòl)

Part V. Letter of Agreement

LETTRE D'ACCORD TYPE ENTRE LE PNUD ET LE GOUVERNEMENT POUR LA FOURNITURE DE SERVICES D'APPUI

Monsieur le Ministre,

1. J'ai l'honneur de me référer aux consultations qui ont eu lieu entre les représentants du gouvernement d'Haïti, (ci-après dénommé le « Gouvernement ») et les représentants du PNUD concernant la fourniture, par le bureau de pays du PNUD, de services d'appui à des programmes ou projets gérés au niveau national. Le PNUD et le Gouvernement conviennent par la présente que le bureau de pays du PNUD peut fournir ces services, à la demande du Gouvernement, par l'intermédiaire de son institution désignée dans le descriptif de projet correspondant, suivant la procédure décrite ci-dessous.

2. Le bureau de pays du PNUD fournit des services d'appui, notamment une assistance pour l'établissement de rapports et le paiement direct. Ce faisant, il doit veiller à renforcer la capacité du Gouvernement (le Partenaire de réalisation), afin que ce dernier puisse mener ces activités directement. Les frais engagés par le bureau de pays du PNUD dans la prestation desdits services d'appui sont imputés sur son budget d'administration.

3. En outre, le bureau de pays du PNUD peut fournir, à la demande du Partenaire de réalisation, les services d'appui ci-après pour la réalisation des activités du projet :

- (a) Identification et/ou recrutement du personnel à affecter au projet ;
- (b) Définition et facilitation des activités de formation ;
- (c) Achat de biens et de services.

4. Le bureau de pays du PNUD achète des biens et services et recrute le personnel à affecter au projet conformément aux règlements, règles, politiques et procédures du PNUD. Les services d'appui décrits au paragraphe 3 ci-dessus doivent être détaillés dans une annexe au descriptif de projet, sous la forme présentée dans l'appendice. En cas de changement des conditions applicables aux services d'appui fournis par le bureau de pays pendant la durée d'un projet, l'annexe au descriptif de projet est révisée par accord mutuel entre le représentant résident du PNUD et le Partenaire de réalisation.

5. Les dispositions pertinentes de l'accord de base standard conclu entre le gouvernement de la République d'Haïti et le PNUD signé le 28 juin 1973 (le « SBAA ») ou les dispositions supplémentaires qui font partie intégrante du descriptif de projet, y compris celles concernant la responsabilité juridique et les privilèges et immunités, sont applicables à la fourniture de ces services d'appui. Le Gouvernement conserve, par le biais de son Partenaire de réalisation, la responsabilité globale du projet géré au niveau national. La responsabilité du bureau de pays du PNUD se limite à fournir les services d'appui détaillés dans l'annexe au descriptif de projet.

6. En cas de réclamation ou de litige concernant la fourniture des services d'appui par le bureau de pays du PNUD conformément à la présente lettre, ou en découlant, les dispositions pertinentes de l'Accord de base type relatif à l'assistance s'appliquent.
7. Les modalités de recouvrement des coûts par le bureau de pays du PNUD en rapport avec la fourniture des services d'appui décrits au paragraphe 3 ci-dessus doivent être spécifiées dans l'annexe au descriptif de projet.
8. Le bureau de pays du PNUD présente des rapports d'activité sur les services d'appui fournis et rend compte des frais remboursés, autant que de besoin.
9. Les présents arrangements ne peuvent être modifiés que d'un commun accord par écrit entre les parties.
10. Si vous approuvez les dispositions qui précèdent, je vous saurais gré de bien vouloir signer et retourner à notre bureau deux exemplaires de la présente lettre. Lorsque vous aurez signé celle-ci, elle constituera un accord entre votre Gouvernement et le PNUD quant aux conditions régissant la fourniture, par le bureau de pays du PNUD, de services d'appui à des programmes et projets gérés au niveau national.

Veuillez agréer, Madame/Monsieur, l'assurance de ma haute considération.

Signé au nom du PNUD

Sophie de Caen

Senior Country Director

Date : _____

Pour le Gouvernement
Joseph Michel Martelly

Date : _____

Appendice

DESCRIPTION DES SERVICES D'APPUI FOURNIS PAR LE BUREAU DE PAYS DU PNUD

1. Il est fait référence aux consultations entre le Ministère de l'Environnement, l'institution désignée par le Gouvernement de Haiti et les représentants du PNUD concernant la fourniture de services d'appui, par le bureau de pays du PNUD, au projet 00081100 « *Amélioration de la Résilience des Écosystèmes et des Communautés Vulnérables au Changement Climatique de la Montagne à la Mer* » géré au niveau national.
2. Conformément aux dispositions de la lettre d'accord signée le _____ et du document de projet le bureau de pays du PNUD fournira des services d'appui au programme tel que décrit ci-dessous.
3. Services d'appui à fournir :

Project ID : 00081100

Amélioration de la Résilience des Écosystèmes et des Communautés vulnérables au Changement Climatique de la Montagne à la Mer

Services d'appui (insérer la description)	Échéancier de fourniture des services d'appui	Dépenses engagées par le PNUD pour la fourniture de ces services d'appui (le cas échéant)	Montant remboursé au PNUD et mode de remboursement (le cas échéant)
Les paiements, les débours et autres transactions financières	Pendant l'exécution du projet	Universal Price List	Services d'appui
Le recrutement du personnel, le personnel du projet et les consultants	Pendant l'exécution du projet	Universal Price List	Services d'appui
Acquisition de services et d'équipements, et l'élimination / vente de matériel	Pendant l'exécution du projet	Universal Price List	Services d'appui
Organisation d'activités de formation, des conférences et des ateliers	Pendant l'exécution du projet	Universal Price List	Services d'appui
Les autorisations de voyage, les demandes de visa, les arrangements billetterie et voyage	Pendant l'exécution du projet	Universal Price List	Services d'appui
Frais de port, le dédouanement, l'immatriculation du véhicule,	Pendant l'exécution du projet	Universal Price List	Services d'appui

et l'accréditation			
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4. Description des fonctions et responsabilités des parties concernées :
Comme établi dans la section des modalités de gestion du document de projet.