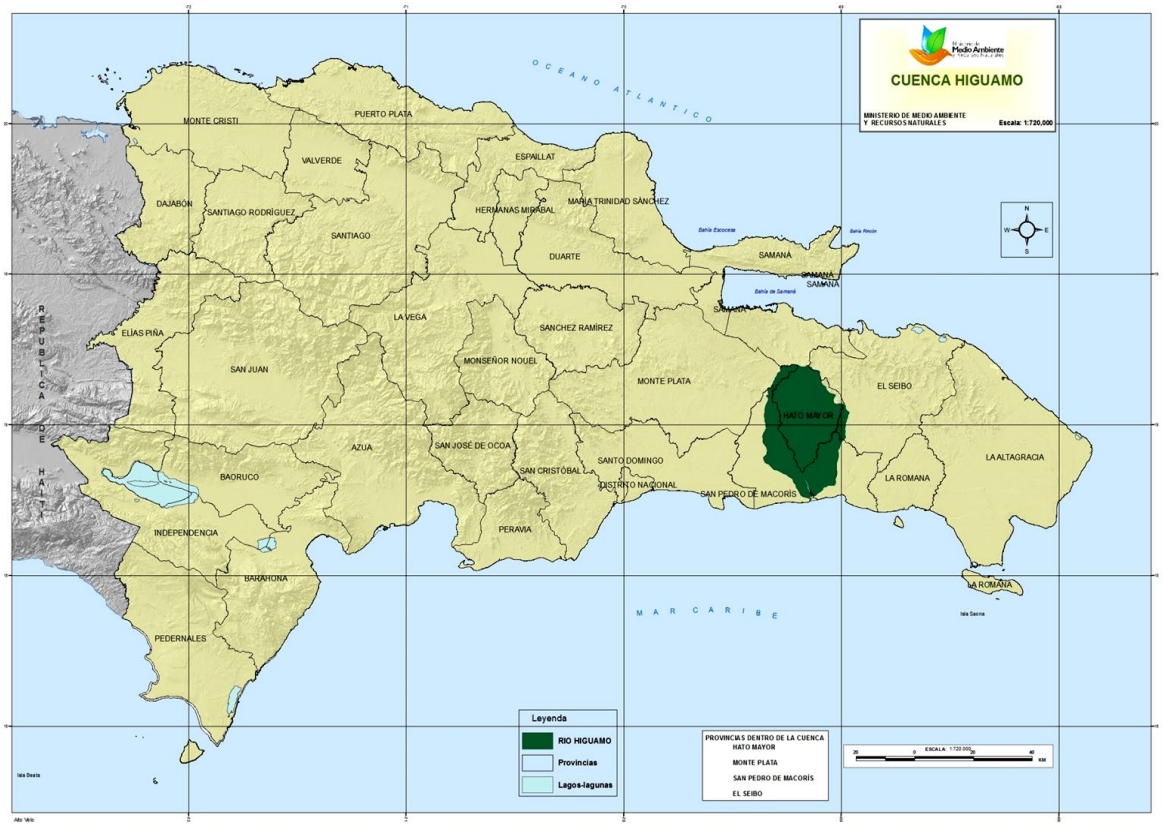
Dominican Republic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SANTIAGO
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MARIA TRINIDAD SANCHEZ
DUARTE
SAMANÁ
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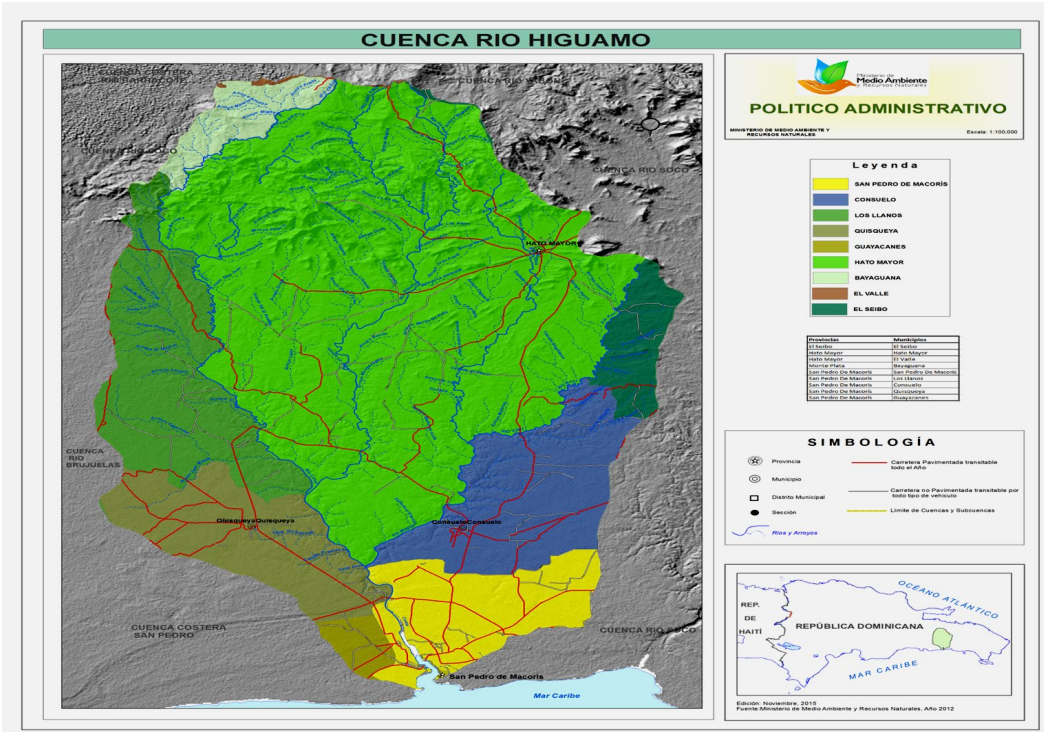
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EL SEIBO
Provincias
Municipios
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Hato Mayor
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El Valle
Monte Plata
Bayaguana
San Pedro De Macoris
San Pedro De Macoris
San Pedro De Macoris
Los Llanos
San Pedro De Macoris
Consuelo
San Pedro De Macoris
Quisqueya
San Pedro De Macoris
Guayacanes
SIMBOLOGÍA
Provincia
Municipio
Distrito Municipal
Seccion
Rios y Arroyos
Carretera Pavimentada transitable todo el Año
Carretera no Pavimentada transitable por todo tipo de vehiculo
Limite de Cuencas y Subcuencas
CUENCA RIO SOCO
CUENCA RIO BRUJUELAS
CUENCA COSTERA SAN PEDRO
HATO MAYOR
Quisqueya
Consuelo
San Pedro de Macoris
Mar Caribe
OCEANO ATLANTICO
REP. DE HAITÍ
REPÚBLICA DOMINICANA
MAR CARIBE
Edición: Noviembre, 2015
Fuente:Ministerio de Medio Ambiente y Recursos Naturales, Año 2012

SUB-PROJECT DESCRIPTION

IWEco National Sub-Project 1.3

Integrated Management of the Biodiversity, Freshwater and Land Resources of the Higüamo River Watershed and its Associated Coastal Zone, including Mitigating Climate Change Impacts

Appendix 26

Lead Organization:	Ministry of Environment and Natural Resources
Contact person:	Antonio E. Matarranz R. M.Sc. National Focal Point Vice-Ministry of Soil and Water Tel.: (809) 567-4300, ext. 7278 E-mail: antonio.matarranz@ambiente.gob.do
Duration of sub-project:	**36 months**
Amount of GEF grant:	**$1,430,646**
Amount of Co-financing:	**$2,500,000**
Total funding:	**$3,930,646**

CONTENTS

1 PROJECT IDENTIFICATION

1.1 Project Summary

The objective of this sub-project is the conservation and sustainable use of biodiversity through the strengthening of national capacities for the integrated management of the Higüamo River watershed, including the maintenance, restoration and sustainability of ecosystem services, supported by appropriate policies, institutional reforms and legislation, as well as by the application of supportive efficient and effective management measures. The aim of the project is to conserve, protect and guarantee the sustainable use of the water, land and biodiversity resources of the Higüamo River watershed and its estuarine zone to ensure the region's future economic development, for the benefit of current and future generations, and to protect and rehabilitate selected ecosystems of the watershed and its associated coastal zone from further damaging anthropogenic activities and the effects of global warming.

The primary focus of this project is the conservation and sustainable use of the watershed's biodiversity. The global biodiversity benefit of this sub-project will be the protection of a significant number of species, many of which are associated with the mangroves of the Higüamo River watershed. To date, approximately 2,830 species of endemic fauna and 2,050 species of endemic plants have been identified in the Dominican Republic. Much of this biodiversity is contained in the Higüamo River watershed and associated coastal zone, the geographical focus of this national sub-project. Many of these species, as indicated in section 2.1, are endangered.

However, the lack of appropriate policy, legal and institutional frameworks undermine the implementation of an integrated management plan for the watershed and its associated coastal area that is a prerequisite for the conservation and sustainable use of the watershed's biodiversity and other natural resources. Futher, this cannot be achieved without also addressing the serious water and land pollution problems that are the greatest threat to the sustainability of the biodiversity of this important region. At the same time, in order to achieve the conservation and sustainable use of biodiversity, a comprehensive, cross-sectoral approach is needed that effectively engages stakeholders by producing concrete benefits leading to improved livelihoods, including improved provision of ecosystem services, greater economic opportunities and a healthier environment in which to live.

Therefore, the project strategy centreson the following approaches and activities:

1. Assessing problems and identifying priorities for improving the management of the land, water and biodiversity resources of the Higüamo River watershed and its associated coastal zone, taking into account climate change, sensitive ecosystems and ecosystem services;
2. Planning the integrated management of the Higüamo River watershed and estuarine zone;
3. Achieving the socio-economic welfare of selected communities of the Higüamo River watershed through the conservation and sustainable use of biodiversity, as well as environmental restoration measures for improved wastewater management, increased access to safe water and enhanced ecosystem services;
4. Strengthening of policies and legal and institutional frameworks for sustainable land management, integrated management of water resources and the management of ecosystem services, taking into account climate change; and

5. Sharing of project information, lessons learned and good practices, and promoting project replication.

In addition to its primary focus on the conservation and sustainable use of the watershed's biodiversity, the Government of the Dominican Republic has indicated that 27,574.12 hectares, or 275.4 km^2,of existing forest cover in the Higüamo River watershed will be protected and sustainably managed through the project. Moreover, the project will support the reforestation of 500 hectares, largely mangroves that are the habitat for a great deal of biodiversity, including endemic species. These actions will provide significant contributions to mitigating the impacts of climate change by maintaining 965,097 tons of retained carbon in existing forests and sequestering another 1,750 through reforestation, for a total of 966,847tons of retained carbon.

By integrating its work in the GEF focal areas of biodiversity, international waters, land degradation, chemicals and the cross-cutting theme of sustainable forest management, the Dominican Republic looks to implement a comprehensive approach for sustainably managing key natural resources in the Higüamo River watershed and associated coastal zone that in turn will contribute to the country's sustainable economic development.

Table of Regional Components, Project Outcomes, and Link to Sub-Project

Regional Component	Project Outcomes	Addressed in Sub-Project?
C1.TECHNICAL SOLUTIONS & BENEFITS	C1.1 Measurable **stress reduction at project sites** through appropriate sustainable water, land and ecosystems management interventions that account for climate change.	**Y**
	C1.2 Enhanced **livelihood opportunities and socio-economic co-benefits** for targeted communities from improved ecosystem services functioning.	**Y**
C2.MONITORING SYSTEMS	C2.1 Strengthened **national and regional systems for monitoring** of environmental status with respect to key international agreements.	**Y**
C3. POLICY & CAPACITY	C3.1 Strengthened **policy and legislation** for the effective management of water, land and ecosystems resources that account for climate change.	**Y**
	C3.2 Strengthened **capacity of national and regional institutions** and other stakeholders for water, land, and ecosystems management that accounts for climate change.	**Y**
C4. KNOWLEDGE MANAGEMENT	C4.1. Improved **engagement and information access** for practitioners and other stakeholders through targeted knowledge sharing networks.	**Y**

Table of GEF FA Objectives, Project Outcomes and Corresponding Sub-Project Outcomes

GEF Focal Area Outcome	Project Outcomes (above)	Sub-Project Outcomes
National Component 1: Development and implementation of approaches for the integrated management and maintenance of ecosystem services of the Higüamo River watershed		
IW 1.3, 2.3; LD 3.3, BD 2.1	C1.1 Solutions	• A master plan for the integrated management of the Higüamo River watershed and its estuarine zone (LD 3.3 and BD 2.1) • Reduced atmospheric, water and land pollution (IW 1.3 and LD 3.3). • Reduction of water, groundwater and land pollution from inadequate management of solid wastes in a selected area of the watershed (LD 3.3)

GEF Focal Area Outcome	Project Outcomes (above)	Sub-Project Outcomes
		• Improved access to safe water (IW 1.3 and 2.3). • Improved health of the ecosystems of the watershed and its estuarine zone (BD 2.1). • Ecosystem restoration (BD 2.1 and LD 3.3). • Increased populations of native and endemic species due to ecosystem restoration and improved management (BD 2.1) • Improved land use (LD 3.3). • Reduction of risks from natural disasters and land degradation (LD 3.3). • Improved provision of ecosystem services (BD 2.1).
LD 3.2; BD 2.1	C1.2 Benefits	• A master plan for the integrated management of the Higüamo River watershed and its estuarine zone (LD 3.2 and BD 2.1) • Improved livelihoods of selected communities (BD 2.1 and LD 3.2) • Improved land use (LD 3.2).
National Component 2: Assessing problems and identifying priorities for improving the management of the land, water and biodiversity resources of the Higüamo River watershed and its associated coastal zone, taking into account climate change, sensitive ecosystems and ecosystem services		
IW 2.1; BD 2.1	C2.1 Monitoring	• Knowledge base for the project's programme of work (IW 2.1 and BD2.1)) • Scientifically and technically sound understanding of progress achieved through project interventions (IW 2.1 and BD 2.1) • Improved water quality as a result of accurate assessments verifying the effectiveness of project interventions or leading to corrective measures, as required (IW2.1 and BD 2.1)
National Component 3: Strengthening of policies and legal and institutional frameworks and capacity building for sustainable land management, integrated management of water resources and the management of ecosystem services, taking into account climate change		
IW 1.1, 1.4, 2.1	C3.1 Policy	• A master plan for the integrated management of the Higüamo River watershed and its estuarine zone (IW 1.1, IW 1.4 and IW 2.1) • Improved legal and regulatory frameworks for integrated watershed and coastal zone management (IW 1.1, IW 1.4 and IW 2.1) • New and/or revised policy framework for integrated watershed and coastal zone management (IW 1.1, IW 1.4 and IW 2.1) • Institutional improvements required for improving the integrated management of Higüamo River watershed and its estuarine zone (IW 1.1, IW 1.4 and IW 2.1)
LD 3.1, 3.2; SFM 1.1, 1.2	C3.2 Capacity	• Greater understanding of public officials and stakeholders in project intervention areas of the benefits of IWCAM (LD 3.1, LD 3.2, SFM 1.1 and SFM 1.2) • Strengthened implementation of IWCAM (LD 3.1, LD 3.2, SFM 1.1 and SFM 1.2) • Increased awareness of the achievements and benefits of the project(LD 3.1, LD 3.2, SFM 1.1 and SFM 1.2) • Project replication(LD 3.1, LD 3.2, SFM 1.1 and SFM 1.2)
National Component 4: Sharing of project information, lessons learned and good practices, and promoting project replication		
SFM 1.3	C4.1. Knowledge	• Increased awareness of the achievements and benefits of the project (SFM 1.3) • Project replication (SFM 1.3) • Greater understanding of appropriate measures to be applied in achieving IWCAM among SIDs (SFM 1.3)

Table of activities by GEF funding and co-finance. . (Data below is adjusted to the up-dated Budget / September 2018 / 3 years timeline). See Annex 3.3: Budget in UNEP format.

Key Outputs		Sources of funding		
		GEF funding (US$)	Co-financing/ counterpart (US$)	Total Cost (US$)
National Component 1.1 Innovative Solutions (incl Socio-economic benefits)				
Sub-component – Output 1.1: Developing an integrated management plan for the Higüamo River watershed and estuarine zone				
Sub-component– Output 1.2: Supportive plans and guidelines				
Sub-component– Output 1.3: Environmental restoration and sustainable use measures for improved wastewater management, increased access to safe water and enhanced ecosystem services				
National Component 2.1 - Systems for monitoring				
Sub-component – Output 2.1: Identifying priority problems and sources of pollution				
Sub-component– Output 2.2: Monitoring and assessment of project interventions and capacity building to support project implementation				
National Component 3.1 Policy and legislation				
Sub-component – Output 3.1: Policies and legal and institutional frameworks				
National Component 3.2Capacity building				
Sub-component – Output 3.2: Capacity-building				
National Component 4.1 Knowledge Management				
Sub-component – Output 4.1: Dissemination of information, good practices and lessons learned and project replication				
	TOTAL (in PIF)	**N/A**	**N/A**	**N/A**
	TOTAL (revised if applicable)	**1,430,646**	**2,500,000**	**3,930,646**

2 PROJECT DESIGN

2.1 Background and Context

The biodiversity of the Dominican Republic is one of the richest in the world. To date, approximately 2,830 species of endemic fauna and 2,050 species of endemic plants have been identified. Much of this biodiversity is contained in the Higüamo River watershed and associated coastal zone, the geographical focus of this national sub-project.

In the case of the Higuamo River watershed and estuarine zone, five types of terrestrial and wetland ecosystems predominate:

- Semi-humid broadleaf forests,
- Humid broadleaf forests,
- Broadleaf shrubs,
- Mangroves and
- Marshes with brackish water dominated by herbaceous plants.

Those dominating the lower course of the river and its estuarine zone are mangroves, marshes and humid broadleaf forests.

Two important protected areas are contained within the watershed's estuarine zone. The 1.41 km^2 Laguna Mallen Wildlife Refuge was established in 2009 in the estuary for the protection of numerous species of egrets, migratory ducks and native and endemic species.

Also established that year in the upper part of the estuary was the Higüamo River Wildlife Reserve, with an extension of 18.49 km^2, dominated by mangroves that are habitat for a large number of native, endemic and migratory species of birds, as well as other estuarine, coastal and marine species. Of the 221 species of vascular plants identified in the Higüamo River Wildlife Refuge during a field study undertaken in April 2011, 196 are native species and 10 are endemic. Seventeen native plant species have been classified as threatened, with five being endemic. Two of the latter are listed in Appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).All four mangrove species found in the watershed are listed as threatened. At least 10 of the 221 species identified have medicinal uses in the country. The study also recorded the presence of 3 and 10 endemic species of amphibians and reptiles respectively, with another two species of native reptiles. Of these, seven are listed as endangered, with the Boa of Hispaniola (*Epicratesstriatus*) on Appendix II of CITES. The study also identified 38 species of birds, of which seven are endemic, 27 are natives, three are migratory and one is introduced. Among Lepidoptera (butterflies and moths), 31 species were identified, with four being endemic, another 26 being native and one being invasive.

Endangered Plant Species of the Higüamo River Wildlife Refuge

Scientific name	Common name	Status	Threatened category
Roystoneahispaniolana	Palma real	Endemic	VU

Mammeaamericana	Mamey	Native	EN
Conocarpus erectus	Mangle de botón	Native	VU
Psedanamomisumbellulifera	Ciruela de las aminas, canela cimarrona	Native	VU
Rhizophora mangle	Mangle rojo	Native	VU
Avicenniagerminans	Mangle prieto	Native	EN
Lagunculariaracemosa	Mangle blanco	Native	VU
Diospyrosdomingensis	Cocuyo	Endemic	CR
Mimosa domingensis	Zarza	Endemic	VU
Oeceocladesmaculata	Orquideaafricana	Introduced	VU
Ceibapentandra	Ceiba	Native	EN
Cocothrinaxargentea	Guano	Native	VU
Coccolobapubescens	Hojaancha	Native	VU
Zamia pumila	Guayiga	Native	VU
Acrocomiaquisqueyana	Corozo	Endemic	VU
Pimentaozua	Berron	Nativa	VU
Coccolobaceibensis	Uvacimarrona	Endemic	VU
Sources: Lista Roja de Plantas de la República Dominicana (2010) (Borrador) y (UICN, 2009). **VU=**Vulnerable, **EN=** Endangered, **CR=**Critically endangered.			

The river also flows into the 7,860.71 km2 Coral Reefs of the Southeast Marine Sanctuary, established in 2009 and which is habitat for a large number of marine species, including threatened species such as the Basking Shark (*Cetorhinusmaximus*), the manati (*Trichechusmanatus*) and marine turtles. As such, the rehabilitation and sustainable management of the Higüamo River is critical for the conservation of the biodiversity of the Dominican Republic and the Caribbean region.

The headwaters of the Higüamo River are located in the Eastern Range of the Dominican Republic at 325 meters above sea level. The watershed is the largest in the eastern region and the sixth largest in the country with a surface area of 1,182 km^2, equivalent to 2.4% of the country's total surface area. Precipitation varies between 1,000 and 2,250 mm per year. The river flows southward for 72.5 kilometersthrough the Provinces of Hato Mayor and San Pedro de Macoris to the Caribbean Sea, where it empties 75kilometers to the east of Santo Domingo, the country's capital. Its watershed is historically noted for the extensive cultivation of sugar cane. Forty kilometers of the lower river are navigable, being used primarily during the first half of the twentieth century to transport sugar from industrial refineries to the port of San Pedro de Macoris, the country's most important for the exportation of sugar.

The wide-spread cultivation of sugar cane continues to predominate today, but the agricultural sector is now more diversified, including livestock activities and the production of citrus fruits. According to the Ministry of Environment and Natural Resources, the predominant land use activity in the watershed is the cultivation of sugar cane, accounting for 41,183.3 hectares, followed by 12,723.4 hectares for pastures. Mixed pastures and other agricultural lands account for an additional 23,598.5 hectares. Citrus plantations extend over a surface area of 4,810.05 hectares in the middle and upper sectors of the watershed. Total forest cover accounts for 27,574.12 hectares, or 23.3% of the watershed's surface area.

The quality of water supply and sanitation services in the country is generally poor and the Higüamo River is no exception. It is considered one of the most polluted rivers in the country, particularly the lower one-fourth of the river running through San Pedro de Macoris where industry is concentrated and the province's urban center is located. The situation is further aggravated during the months of January to April when the volume of flow of the river is at its lowest, down to a range of 4.74 to 6.86 m^3 per second as compared to 16.6 to 22 m^3 per second from May to November.

Electricity plants and industries located along the river and untreated municipal wastewater have contributed to the river's pollution and degradation, although a few industries such as the Brugal Distillery, the country's largest producer of rum, and the Cristobal Colon Sugar Refinery in San Pedro de Macorishave installed industrial waste and wastewater treatment plants. Pesticide and fertilizer runoff from agricultural activities is also contributing to the pollution of the river. Polluted waters are impacting negatively on fish and other freshwater and coastal fauna, as well as on tourism activities in Juan Dolio and Guayacanes and nearby coral reefs. Access to safe drinking water is increasingly a major problem. Groundwater is also being polluted in some areas, while in other areas odors from contaminated waters are contributing to discomforts in local communities. Degradation of groundwater quality and supply is a particularly serious problem since aquifers provide 95% of the drinking water of the Municipality of San Pedro de Macoris.

Despite the river's estuary containing mangroves that are an important natural nursery for a wide variety of fish, crustaceans and other fauna, biodiversity degradation continues unabated for the reasons given above.

Policy, legal and institutional situation

The country lacks a national strategy for water and sanitation. Consequently, it is not surprising that policy and regulatory functions in this critical area continue to be fragmented. According to the OECD's comprehensive analysis of water policies in the Dominican Republic contained in *Water Governance in Latin America and the Caribbean: A Multi-Lateral Approach* (2012), the country suffers from a lack of horizontal (cross-sectoral and inter-agency) and vertical (national to regional to local) policies for the coordination and integrated management of water resources. No inter-institutional mechanism exists for addressing territorial water concerns. The situation is further complicated by legislation that is also outdated, fragmented and sector biased. However, the country is currently in the process of revising its freshwater legislation and in so doing is addressing complex issues of a political nature.

As in the case of freshwater management, specific policies, strategies and plans are also lacking for land management. There is currently no land-use planning legislation for guiding the sustainable geographic development of the country.

In addition, the system of protected areas in the Higüamo River watershed and estuarine zone is very deficient. Less than 20 hectares have been set aside as protected areas, primarily in an area subject to extreme water pollution, representing a minute percentage of the watershed's 118,200 hectares.

Despite these limitations, the over-arching framework of the sub-project is the country's *National Development Strategy 2010-2030* (END for the Spanish acronym) adopted in 2010. It is constructed around four strategic axes, with the fourth one being the sustainable management of environment and adequate adaptation to climate change. The axis has four objectives:

1. Protect and use sustainably ecosystem goods and services, biodiversity and the natural patrimony of the country, including marine resources;
2. Promote sustainable production and consumption;
3. Develop the sustainable management of wastes, hazardous substances and sources of pollution; and
4. Manage water resources efficiently and sustainably in order to ensure safe water.

Based on the END, the country also adopted the National Strategy for the Conservation and Sustainable Use of Biodiversity and Action Plan 2011-2030 (ENBPA for the Spanish acronym), which will be fundamental to the implementation of this sub-project. The Ministry of Environment and Natural Resources through its Programme of Work is implementing four programs addressing the conservation and sustainable use of biodiversity, initially adopted for the period 2008-2010: Programme 11 on the conservation of protected areas and biodiversity; Programme 12 that has sub-programmes on forest resources and coastal and marine resources; Programme 14 on the protection and defense of the environment and Programme 99 on the budgets of the National Botanical Gardens, the National Museum of Natural History and the National Aquarium.

As indicated earlier, the country lacks relevant government national policies and initiatives for the management of freshwater resources. One exception is the National Plan for Utilization and Control of Subterranean Water (PLANICAS for the Spanish acronym) adopted in 1983 and involving INDRHI, the Corporation of Aqueducts and Sewerage of Santo Domingo (CAASD for the Spanish acronym) and the Institute of Potable Water and Sewer Systems (INAPA).

Stakeholder Involvement

In designing the sub-project, the Ministry of Environment and Natural Resources has undertaken three consultations with stakeholders, both from the public and private sectors, in the watershed on priorities, project elements and activities, the selection of project intervention areas and stakeholder participation in sub-project implementation. Over 40 organizations and institutions were involved in these consultations.

Key public sector stakeholders in the implementation of this sub-project are:

- The Ministry of Environment and Natural Resources (MARENA for the Spanish acronym), in particular its Provincial Directorates in San Pedro de Macoris and Hato Mayor;
- The National Institute of Water Resources (INDRHI for the Spanish acronym);
- The National Institute of Potable Water and Sewer Systems (INAPA for the Spanish acronym);
- The Ministry of Agriculture;
- The Ministry of Public Health and Social Security (MS for the Spanish acronym); and
- local authorities.

Other stakeholders include non-governmental organizations such asuniversities, as well as private industry, the tourism industry, and local communities, among others. The potential arrangements for their respective and continued involvement in the sub-project will be further developed during the inception phase. For example, the Universidad Central del Este (UCE) and the Universidad Nacional Pedro Henrique Ureña UNPHU) could play a leading role in the sub-project's monitoring and assessment activities, as well as in training activities.

A key stakeholder that will be engaged in supporting the implementation of the sub-project is the Multi-sectoral Coalition for the Conservation of the Higüamo River Watershed. The organization is comprised of the principal private sector industries operating along the river, including: sugar refineries (Cristobal Colon Refinery, Sugar Consortium of Industrial Enterprises [CAEI for the Spanish acronym] and the Tecno-Deah Consortium); distilleries (Destillería de Ron Brugaland Ron Barcelo [BEICA]); food processing plants (Molinos de Higüamoand Cesar Iglesias, S.A.); a chemical fertilizer plant (FertilizantesQuimicosDominicanos, S.A. [FERQUIDO]); electricity generating plants (EGE-Haina); a soap and detergent production plant (Cesar Iglesias, S.A.); a cement manufacturer (CEMEX); and a recreational facility (the Metro Country Club), among others. The coalition has developed a Code of Conduct for eliminating negative environmental impacts and an Environmental Emergency Plan for all its members that will contribute to the environmentally sound and sustainable management of the Higüamo River watershed. It will be supporting the sub-project's activities to re-establish mangrove forests along the river, particularly its estuarine zone where impacts have been the heaviest, and to reduce industrial discharges into the river.

Other NGOs are prepared to support the implementation of the sub-project in areas such as reforestation, biodiversity conservation and sustainable use, training in local communities, training of youth, disaster reduction and good agricultural practices. These include:

- Macoris Verde (agroforestry, reforestation, capacity building in local communities),
- The Marine Studies Foundation (FUNDEMAR for the Spanish acronym) (sustainable management of coastal and marine ecosystems),
- The Protectors of the Environment Foundation (reforestation, capacity building in local communities),
- The Council for Ecotourism Development in the Province of Hato Mayor (CODEPRHAM for the Spanish acronym) (reforestation, training and engagement of youth),
- The Green Foundation (reforestation, capacity building in local communities).

2.2 Overall Objective and Outcome

2.2.1 Objective:

The objective of the sub-project is the conservation and sustainable use of biodiversity through the strengthening of national capacities for the integrated management of the Higüamo River watershed, including the maintenance, restoration and sustainability of ecosystem services, supported by appropriate policies, institutional reforms, legislation, as well as by the application of supportive efficient and effective technologies.

2.2.2 The expected outcomes are:

The principal outcome of this project will be the integrated management of the Higüamo River watershed and its estuarine zone that will provide benefits in the form of biodiversity conservation and enhanced provision of ecosystem services, safe and improved water quality, rehabilitation and increased productivity of land, and climate change mitigation, which together will improve the livelihoods of local communities.

In addition to its primary focus on the conservation and sustainable use of the watershed's biodiversity, the Government of the Dominican Republic has indicated that 27,574.12 hectares, or 275.4 km^2,of existing forest cover in the Higüamo River watershed will be protected and sustainably managed through the project. Moreover, the project will support the reforestation of 500 hectares, primarily mangroves that are the habitat for a great deal of biodiversity, including endemic species.

Specific beneficial outcomes will include, among others:

- Protection of threatened species of terrestrial, wetland and marine flora and fauna, many of which are endemic;
- Increased populations of native and endemic species due to ecosystem restoration and improved management;
- An expanded watershed protected areas system through the establishment of new protected areas;
- Improved health of ecosystems;
- Greater public awareness and support for the conservation and sustainable use of biodiversity and the maintenance of ecosystem services;
- Reduced atmospheric, water and land pollution;
- Improved health and welfare of selected local communities;
- Reduction of risks from natural disasters and land degradation;
- Improved livelihoods of selected local communities as a result of increased access to safe water, a sustainable natural resources base, increased economic opportunities and a healthier environment to live in; and
- Improved policy, legal, regulatory and institutional frameworks for integrated watershed and coastal zone management.

To achieve these ends, sub-project activities will focus on:

1. Assessing problems and identifying priorities for improving the management of the land, water and biodiversity resources of the Higüamo River watershed and its associated coastal zone, taking into account climate change, sensitive ecosystems and ecosystem services;
2. Planning the integrated management of the Higüamo River watershed and estuarine zone;
3. Achieving socio-economic welfare of selected communities of the Higüamo River watershed through environmental restoration measures for improved wastewater management, increased access to safe water and enhanced ecosystem services;
4. Strengthening of policies and legal and institutional frameworks for sustainable land management, integrated management of water resources and the management of ecosystem services, taking into account climate change; and
5. Sharing of project information, lessons learned and good practices, and promoting project replication.

2.3 Consistency with International Efforts

The sub-project is structured to help the Dominican Republic as a contracting party meet its obligations under the Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention to Combat Desertification (UNCCD), the Stockholm Convention on Persistent Organic Pollutants, the Ramsar Convention on Wetlands, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), as well as the Cartagena Convention for the Protection and Development of the Marine Environment of the Wider Caribbean.

As indicated earlier, the sub-project will build upon the National Strategy for the Conservation and Sustainable Use of Biodiversity and Action Plan 2011-2030 (ENBPA for the Spanish acronym), which was developed as a strategy and plan to assist the Government of the Dominican Republic in meeting its obligations as a Party to the CBD.

Other projects will also serve as building blocks for the implementation of this project. Specifically, relevant information, experiences and lessons learned will be incorporated into the sub-project's programme of work.

First and foremost is the GEF Integrated Watershed and Coastal Areas Management Project in Caribbean Small Island Developing States (IWCAM), involving thirteen countries, which in the case of the Dominican Republic supported the establishment of a demonstration site on wastewater treatment for the mitigation of impacts from industrial wastes on the Lower Haina River basin and its coastal area. The project contributed to the reduction of industrial pollution, improvements in water quality and the creation of a sustainable management plan for the watershed.

The GEF project Re-engineering the National Protected Areas System to Achieve Financial Stability will also be taken into account. The objective of the project is the achievement of the sustainability of the country's national protected areas, which is relevant to this project's proposed outcome of extending the protected areas within the Higüamo River watershed and estuarine zone.

With the support of UNDP, the International Institute for Sustainable Development (IISD) completed a study entitled *Climate Risk Management for Water and Agriculture in the Dominican Republic: Focus on the Yaque del Sur Basin* (January 2013). Although focused on one watershed, it provides the basis for identifying climate risks and prioritizing measures to manage them. Several national experts, key governmental and non-governmental agencies and international specialists in water, agriculture and climate participated in the study.

Earlier in 2001, UNDP financed the preparation of a study for the Secretariat of Environment and Natural Resources, today the Ministry of Environment and Natural Resources, entitled *Vulnerability and Adaptation to Climate Change in the Water Resources Sector of the Dominican Republic* which identifies measures that can be taken in response to the threats posed by climate change that should be taken into account in the implementation of this sub-project.

2.4 Activities, Outputs, Outcomes

Activity label in the Annotated FSP costed outline; BUDGET PER ACTIVITY (*) in US$.....INCLUDED

The project has four major components, each of which has corresponding sub-component activities and outcomes as described below:

1. Developing and implementing approaches for the integrated management and maintenance of ecosystem services of the Higüamo River watershed;
2. Assessing problems and identifying priorities for improving the management of the land, water and biodiversity resources of the Higüamo River watershed and its associated coastal zone, taking into account climate change, sensitive ecosystems and ecosystem services
3. Strengthening of policies and legal and institutional frameworks and capacity building for sustainable land management, integrated management of water resources and the management of ecosystem services, taking into account climate change; and
4. Sharing of project information, lessons learned and good practices, and promoting project replication.

Component 1: Developing and implementing approaches for the integrated management and maintenance of ecosystem services of the Higüamo River watershed

This component is key for equipping the Government of the Dominican Republic with a master plan and complementary tools for undertaking actions leading to the integrated management of the Higüamo River watershed and its estuarine zone. It aims at achieving the socio-economic welfare of selected communities through interventions leading to (a) safer access to water and enhanced ecosystem services by effectively addressing water contamination from agriculture, industry and municipal wastewater, (b) improved economic opportunities resulting from the conservation and sustainable use of biodiversity and other natural resources and (c) greater preparedness in response to natural disasters, including those resulting from climate change.

The GEF Small Grants Programme (GEF-SGP) will support the development and implementation of smaller-scale investments associated with the main project to enhance economic livelihood opportunities. These will be defined during project inception and negotiated over the early stages of project implementation.

Sub-component 1.1: Developing an integrated management plan for the Higüamo River watershed and estuarine zone

Activities:

- The preparing of a master plan for the integrated management Higüamo River watershed and estuarine zone, taking into account innovative adaptations to climate change and sensitive ecosystems.
- Develop necessary professional skills at the national and/or local levels to support project implementation.

Outputs:

- A master plan for the integrated management of the Higüamo River watershed and its estuarine zone and capacity building for staff engaged in sub-project implementation.
- At least 60% of the professionals in involved partner agencies (government agencies, municipalities) and civil society organizations (universities, NGOs, etc.) trained by year 4 in key technical areas related to the development and implementation of project interventions for future replication and integration within national frameworks.

Outcomes:

- ***The integrated management of the Higüamo River watershed and its estuarine zone.***
- ***Increased professional capacity for project implementation and replication.***

Sub-component 1.2: Supportive plans and guidelines

Activities:

- Develop guidelines for coastal bioengineering and reforestation.
- Develop guidelines for watershed reforestation.
- Developand applyguidelines for installation and operation of small wastewater treatment systems.
- Develop water safety plans for select small public water supply systems.
- Develop a plan for reducing water pollution from land-based activities in the watershed.
- Develop and apply a protocol for the management and control of organic waste.
- Develop guidelines for bioengineering for slope stabilization, runoff control and aquifer replenishment.

Outputs:

- Guidelines for coastal bioengineering and reforestation.
- Guidelines for watershed restoration.
- Guidelines for small wastewater treatment systems.
- Water safety plans.
- Plan for reducing land-based sources of water pollution.
- Good agricultural practices (GAP) protocol for the management and control of organic waste, from cattle
- Guidelines for bioengineering for slope stabilization, runoff control and aquifer replenishment.

Outcomes:

- ***Enhanced technical knowledge for designing effective investments inecosystem restoration and sustainable land management***
- ***Enhanced technical knowledge for designing effective investments in wastewater treatment systems.***

Sub-component 1.3: Environmental restoration and sustainable use measures for improved wastewater management, increased access to safe water and enhanced ecosystem services

Activities:

- Create a habitat conservation program for ecosystems and threatened species in the watershed and its estuarine zone.
- Promote ecotourism in the watershed and its estuarine zone.
- Reforest 500 hectares of critical areas within the watershed, with particular attention given to mangroves.
- Promote good fishing practices in the watershed and estuarine zone.
- Strengthen the implementation of the National Emergency Plan, taking into account climate change related disasters, including hurricanes, floods and landslides, as well as land degradation.
- Install and assesseffectiveness of rainwater harvesting systems.
- Implement a pilot project on solid waste management in a selected community within the watershed.
- Implement a pilot project on wastewater treatment in a selected community/ area within the watershed.

Outputs:

- A conservation program for ecosystems and threatened species taking into account protection measures, training requirements, control of invasive species and relocation of domestic animals.
- A proposal for the establishment of new protected areas.
- The establishment of an ecotourism route in the Higüamo River watershed and its estuarine zone making use of existing Wildlife Refuges.
- Reforestation of critical watershed areas.
- Improved fishing practices in project intervention areas.
- Strengthened National Emergency Plan.
- Installed rainwater harvesting systems in target community
- A pilot project on improved solid waste management in a selected community.
- A pilot project on improved wastewater treatment in a selected community.

Outcomes:

- ***Improved provision of ecosystem servicesfrom the watershed and its estuarine zone through reduced atmospheric, water and land pollution.***
- ***Enhanced protection of important terrestrial and aquatic species and habitats through expanded watershed protection and establishment of new protected areas.***
- ***Improved livelihoods of selected communities.***
- ***Reduced threats of impaired public heath through improved access to safe water***

Component 2: Assessing problems and identifying priorities for improving the management of the land, water and biodiversity resources of the Higüamo River watershed and its associated coastal zone, taking into account climate change, sensitive ecosystems and ecosystem services;

Through this component, the scope and degree of environmental problems threatening freshwater, land and biodiversity in the Higüamo River and its estuarine zone will be assessed as a basis for implementing specific actions that strategically respond to these threats, as well as for assessing the effectiveness of the measures implemented in reducing and eliminating these threats. The activities of this component are grouped under two sub-components.

Sub-component 2.1: Identifying priority problems and sources of pollution

Activities:

- Identify and assess problems and sources of pollution impacting ecosystem and human heath within the Higüamo River basin.
- Identify human health risks for selected communities resulting from polluted freshwater and coastal waters.
- Identify priorities to manage and guide investments in efficient natural resource and ecosystem management.

Outputs:

- Priorities to be addressed in the project for guiding investments for achieving efficient and effective land use and ecosystem management.
- Completed baseline for structuring the project's monitoring programme.
- Assessment of human health risks for selected communities.

Outcome:

- ***Improved decision making capability for integrated management of the Higüamo River watershed and its estuarine zone through the availability of acomprehensive knowledge base.***

Sub-component 2.2: Monitoring and assessment of project interventions and capacity building to support project implementation

Activities:

- Identify and select the environmental and socio-economic indicators to be used for monitoring and assessing ecosystem and water quality in the watershed and the effectiveness of project interventions, taking into account the requirements of the LBS Protocol.
- Establish a monitoring program based on the selected indicators for periodically assessing the quality of freshwater and coastal seawater.
-

Outputs:

- Environmental and socioeconomic indicators for monitoring and assessing water quality in the watershed and the effectiveness of project interventions.
- Periodic project reports on water quality in the watershed and the associated coastal zone.

Outcomes:

- ***Scientifically and technically sound understanding of progress achieved through project interventions; and improved water quality as a result of accurate assessments verifying the effectiveness of project interventions or leading to corrective measures, as required.***

Component 3: Strengthening of policies and legal and institutional frameworks and capacity building for sustainable land management, integrated management of water resources and the management of ecosystem services, taking into account climate change

The aim of this component will be to strengthen the policy framework for biodiversity resource conservation through integrated watershed and coastal zone management of the Higüamo River by revising and strengthening institutional mechanisms and updating relevant legislation, as well as build capacity for implementing integrated watershed and coastal area management and maintaining ecosystem services.

Sub-component 3.1: Policies and legal and institutional frameworks

Activities:

- Develop mechanisms for improved coordination between the sectors involved in the management of biodiversity, water resources, including coastal zone waters.
- Assess existing legislation relevant to the integrated management of the Higüamo River watershed and its estuarine zone, make recommendations for strengthening and engage processes for reform.
- Assess existing policies relevant to the integrated management of the Higüamo River watershed and its estuarine zone, make recommendations for strengthening and contribute to process of reform.
- Assess the feasibility of restructuring and integrations institutions most closely linked to the integrated management of Higüamo River watershed and its estuarine zone, make recommendations for reform, and commence the process.

Outputs:

- A strengthened National Intersectoral Committee, comprised of government agencies, NGOs and universities, among others, to ensure broad multi-sectoral participation in sustainable land management, integrated management of water resources and sustainable management of biodiversity and ecosystems, taking into account institutional constraints and technical capacity and financial constraints.
- A strengthened legal and regulatory framework on water quality, industrial discharge, land use and ecosystem management.

- Suite of gender-sensitive policy measures for improved watershed and ecosystems management.
- Framework for institutional reform for improved watershed and ecosystems management
- Analyses on gender dimensions and engagement under the project

Outcomes:

- ***Enhancedbiodiversity resource conservation through integrated watershed and coastal zone management (IWCAM) for the Higüamo River watershed and its estuarine zone through strengthened legal, policy and institutional framework,***
- ***Greater awareness and stakeholder buy-in to process of improving the integrated management of Higüamo River watershed and its estuarine zone.***

Sub-component 3.2: Capacity building

Activities:

- Raise awareness among public officials and stakeholders in municipal governments, local government agencies and organizations of the elements and actions required for biodiversity resource management through the IWCAM approach.
- Organizing of a training program directed at public officials and stakeholders, including private industry, on biodiversity within the IWCAM framework and to disseminate project information and lessons learned within the Higüamo River watershed and estuarine zone.

Outputs:

- A comprehensive awareness program
- Training workshops in support of improving ecosystems services through IWCAM in areas including:
  - Cleaner production,
  - Good agricultural practices,
  - Best fishing practices
  - Best environment practices.
- Trained public officials and stakeholders.

Outcomes:

- ***Improved stakeholder participation in management of the resources of the Higüamowatershed***
- ***Reduced levels of environmental resource degradation in the water and its estuarine zone through enhanced capacity amongst stakeholders for sustainable resources management***
- ***Improved sustainable and financially viability of enterprises of stakeholders due to implementation of good management practices***

Component 4: Sharing of project information, lessons learned and good practices, and promoting project replication

The primary aim of component 4 will be the replication of the project throughout and outside the Higüamo River Watershed and estuarine zone through the dissemination of project information and lessons learned.

Outcomes resulting from the activities in Component 4 will be (a) increased awareness of the achievements and benefits of the project; (b) project replication outside project intervention areas, both nationally and internationally; (c) greater understanding of project achievements, benefits and lessons learned inside and outside the Dominican Republic; and (d) equitable gender participation in IWCAM, ensuring in particular the equal access of women and men to the management of safe and sufficient water for domestic supply, sanitation, food security and environmental stability.

Sub-component 4.1: Dissemination of information and lessons learned and project replication

Activities:

- Produce project publications for disseminating scientific and technical information, assessments and analyses, lessons learned and best practices, among others.
- Organize two major technical conferences to demonstrate innovative solutions implemented by the project.
- Disseminate project information, experiences and lessons learned to a wider audience of government officials and stakeholders at the national level.
- Exchange information on experiences and lessons learned with other SIDS.
- Engage stakeholders at the national level in applying good agricultural practices, best fishing practices and best environmental practices in the field.
- Develop and maintain a website for providing up-to-date information on progress in project implementation, including achievements and lessons learned, and replication
- Promote equitable gender participation in project implementation and replication.

Outputs:

- A program for dissemination of project information, experiences and lessons learned to a wider audience of government officials and stakeholders at the national and international levels, with special emphasis on good agricultural practices, best fishing practices and best environmental practices.
- Range of PA/PE resources that will include *inter-alia*: publications, conference reports, workshop reports
- Sensitized stakeholders empowered through knowledge acquisition for project replication.
- Fully functioning website linked to the IW Learn online portal.

Outcomes:

- ***Sensitized public across the country demonstrating more responsibleresource management practices through easily accessibleinformation and knowledge products***
- ***Increased investments through replication of best practices as promoted through knowledge networks.***

2.5 Incremental Reasoning

2.5.1 Baseline

Water resources:

The main water resources challenges facing the Dominican Republic are (a) declining river and spring flows and lake levels, (b) shortage of water for human consumption, (c) shortage of water for irrigation and agro-industrial processes and (d) deteriorating water quality due to contamination from pesticides, fertilizers, industrial discharges, inappropriate solid waste management and discharge of untreated municipal wastewater.

The National Hydraulic Resources Institute (INDRHI for the Spanish acronym) is the lead agency with overall responsibility for the management of the country's freshwater resources. The Vice-Ministry of Soil and Water of the Ministry of Environment and Natural Resourcesis responsible for watershed management, supported by INDRHI and the Ministry of Health. In 2013, INDRHI implemented projects with $467 million in external funding and $25 million in co-financing from government agencies. The most recent significant investments in water resources management in the country under INDRHI include the Monte Grande and the GuagüíDams with funding of $250 million and $88 million respectively. Others include the Project Azua II with funding of $70 million, and $34 million for recovery efforts from the Noel and Olga tropical storms during the 2007 hurricane season. All these initiatives are financed by the World Bank.

Land resources:

Land management interventions are directed at controlling soil erosion and depletion, salinization, compaction and sterilization. The sustainable land management demonstration project in SabanaYegua Municipality addresses problems of land degradation.

The Ministry of Environment and Natural Resources through the Vice-Ministry of Soil and Water is responsible for land resource management in the country. To this end, it is supported by INDRHI, the National Institute of Water and Sewerage (INAP), the Ministry of Public Works and Communication, the General Mining Bureau, the Ministry of Agriculture and the country's Water and Sewerage Corporations. Sustainable land management interventions in the country focus on integrated watershed management, restoration of soils and inland waters, and exploitation of minerals in compliance with environmental regulations, supported by approximately $12 million in funding from the government. However, it should be noted that the exact government investment in sustainable land management is difficult to estimate due to many other relevant investments made into other activities that also benefit sustainable land resource management. Other major interventions include the national QuisqueyaVerde Program, undertaken within the Ministry'sGreen Border initiative, to promote conservation along the border with Haiti, as well as the initiative on theArtibonito watershed shared with Haiti, together receiving $4.5 million in government funding.

Biodiversity:
Given the large size of the country (48,442 km2) and its topographical characteristics, ranging from sea level to 3,098 meters above sea level, the Dominican Republic is one of the richest small island

developing states in biodiversity and endemism. Nearly 5,000 endemic species of flora and fauna have been identified, comprised of 2,050 plant and2,830 animal (mostly arthropod) species. However, this rich biodiversity is increasingly threatened by land conversion, habitat destruction and fragmentation, and land and water degradation due to pollution.

The lead agency charged with biodiversity conservation is the Ministry of Environment and Natural Resources through its Vice-Ministry of Protected Areas and Biodiversity, the Vice Ministry of Forest Resources and the Vice-Ministry of Coastal and Marine Resources.The amount of annual government support to biodiversity conservation will be determined during the sub-project's inception phase. Many biodiversity initiatives have been launched in the country to support its commitments under the Convention on Biological Diversity; strengthen the legal, institutional and regulatory framework; strengthen management of protected areas; improve management of coastal and marine areas; improve management of forest resources; promote scientific research and monitoring; and implement priority actions in *in situ* and *ex situ* conservation. These include the Agroforestry Model for Biodiversity in Neighbouring Communities of the Jaragua and Bahoruco National Parks, funded by the Critical Ecosystems Partnership Fund (CEPF) supported by Conservation International and CANARI, as well as a second CEPF funded project supporting Land Management Capacity and Conservation Plans to Save Endangered Frogs in Four High Priority Key Biodiversity Areas in Hispaniola supported by the Zoological Society of Philadelphia in the amount of $152,400.

Major gaps have become reduced for the implementation of integrated watershed and coastal zone management. These include the creation by The Executive Power by the Decree 265-16 ofan integrated Freshwater Committed to introduce changes in the legal and institutional management policy, (2) the approval of a National Biodiversity Strategy and Action Plan and (3) making efforts to formulate a planfor environmentally sound land use, all three of which are fundamental for achieving sustainable development planning and use of natural resources within the context of a watershed. Moreover, at the National Congress are in discussion freshwater legislation does take into account ecosystem management, particularly as regards the provision of ecosystem services. Although, it is important to point that Environmental policy required actions for law enforcement.

2.5.2 Business as usual scenario

Without the intervention of this sub-project, the deterioration of the natural resources of the Higüamo River watershed and estuarine zone will continue unabated. This will have negative impacts on the livelihoods of the watershed's inhabitants, principally in the form of (1) inadequate access to a sufficient supply of safe water, (2) declining food security due to land degradation, inadequate water supplies and polluted stream and coastal waters, (3) continued risks from natural disasters such as droughts during the summer and extreme weather events, floods and landslides during the hurricane season, (4) negative impacts on coastal tourism as a result of poor coastal water quality and the degradation of important coral reef and mangrove ecosystems and (5) reduced opportunities for the development of ecotourism in the watershed. Most alarming would be an increase in threats to the country's rich biodiversity and its large number of endemic species. Without the sub-project, the country's efforts at mitigating climate change would be adversely affected and the threat of continued deforestation would remain as a major concern.

The institutional, legal and regulatory frameworksneed to be strengthen and more effective in addressing these very serious environmental problems and challenges to sustainable development.

Without the sub-project, it would be unlikely to promote the cross-sectoral and inter-institutional policy coordination that is a prerequisite to achieving integrated watershed management.The legal and regulatory framework on water quality, industrial discharge, land use and ecosystem management would be inadequate to effectively promote the sustainable use of the watershed's natural resources. The current institutional structure is not sufficient for efficiently and effectively implementing the integrated management of the Rio Higüamo and its estuarine zone, which requires a structure integrating the efforts of national, provincial and local authorities and stakeholders.

2.5.3 Incremental reasoning

The sooner integrated management actions can be taken the better since the Dominican Republic is already very vulnerable to the effects of extreme weather events that are increasing in intensity and number largely as a result of climate change. The Higüamo River watershed and associated coastal zone where this GEF project will be developed is among the richest in the country in biodiversity and endemism, covering a surface area of nearly 1,182 km^2 that is increasingly coming under human pressure, so the positive impact will be considerable and wide-reaching nationally and in the Caribbean region. By catalyzing government action leading to the improvement of the required policy, institutional, legal and regulatory frameworks, GEF support will be critical in the efforts to achieve integrated watershed and coastal area management in support of biodiversity conservation. Moreover, to this end, the IWEco project will arm the government and other stakeholders with the necessary planning, management and assessment tools.

- This GEF sub-project will demonstrate that the integrated approach to managing hydrological basins and coastal area ecosystems is an effective, efficient and pragmatic way to mainstream the conservation and sustainable use of their biodiversity. Current policy, institutional, legal and regulatory frameworks are inadequate for achieving environmentally sound integrated watershed and coastal area management in support of the conservation and sustainable use of biodiversity. Specialized agencies in the Dominican Republic will be trained to understand the importance of implementing the ecosystem approach, and with their guidance and support the benefits and importance of this methodology will filter down through all levels of state bureaucracy and to the general populace as a whole. This project will help consolidate and support the efforts of the Government of the Dominican Republic and other regional and international efforts to date, will further the promulgation of lessons learned from previous and ongoing projects and will stimulate a dynamic team approach towards considering environmental aspects when tackling social, development, economic, health, political and other issues in the future.
- In addition, taking an integrated approach will help to put an end to the fragmented and isolated nature of the Dominican Republic Government's various sectors and agencies. This GEF project will make all government (and private sector) players aware that ultimately the health of the natural environment is intimately inter-related with sustainable development, the health and welfare of the Dominican people and the future of the Dominican economy. Issues such as the conservation and sustainable use of biodiversity, preventing soil degradation, increasing agricultural production and resolving issues of food security, improving the quantity and availability of fresh water resources, ensuring the sustainable use of coastal and fisheries resources, cleaner air, cleaning up of household and industrial waste, generation of wealth, and

improving national defenses against the ravages of extreme weather events will no longer be viewed as independent problems, but rather symptoms of a more pervasive general environmental malaise that will be treated holistically so that these issues are successfully resolved. This project will demonstrate that teamwork and cooperation amongst the various government agencies, the private sector and the general populace is the most likely road to a brighter future for all.

- Within the Higüamo River basin, this project will educate the people most affected by the deterioration of ecosystem goods and services of the interactions of all ecosystems processes by allowing them to experience hands-on that the appropriate management of these resources can lead not only to a healthier ecosystem but also to better agricultural yields and increased food security, cleaner and more abundant fresh water, cleaner air, more abundant and sustainable fisheries products, and more opportunities to generate wealth leading to better prosperity for the community as a whole.
- Strengthening the management of wildlife refuges in the Rio Higüamo River watershed, which has received insufficient attention, and the establishment of the watershed's ecotourism route will not only help conserve biodiversity but will of itself generate employment for local populations as guides and other refuge employees. This, together with the anticipated increase in revenues from more local and international tourists visiting Protected Areas will have a cumulative effect in encouraging local populations and Dominicans in general to value their parks and national patrimony.
- The promotion of good agricultural practices and best environmental practices has previously been very limited in the sub-project's intervention area. Training farmers in good agricultural practices and best environmental practices through the GEF sub-project will help to increase yields and to prevent further soil degradation, leading to progressively more agricultural productivity, greater food security and generation of increased wealth in the future. It will also contribute to a decreased use of pesticides and fertilizers that are polluting the waters of the watershed and its associated coastal zone, thus eliminating serious negative impacts on coastal ecosystems and coastal tourism.
- Cleaning up household and industrial sources of pollution will lead to less contamination of the watershed and coastal ecosystems, healthier and more abundant fisheries and other marine resources, more food security and generation of wealth, and cleaner air. The GEF sub-project will be a first attempt at doing so in the Higüamo River watershed.

2.5.4 Socio-economic benefits

In terms of the potential socio-economic benefits gained from project implementation, the following are some of the more tangible gains:

- Ecosystem goods and services given due value and importance within economic sector.
- Greater agricultural production leading to increased food security.
- Greater agricultural production to more income from sales of increased production.
- Cleaner and more abundant fresh water supply leading to better health.

- More jobs available both within refuges, as a result of an increase in tourism, and from other ecosystem goods and services.
- Less pollution from households as people are made aware of the devastating effects and plants are constructed to treat domestic and industrial waste.
- Less pollution from industry as companies are held accountable for polluting practices through enforceable system of fines, community clean up initiatives, etc. and effective mechanisms are introduced for cleaning up and recycling industrial wastes.
- Valuation of national patrimony – not only in intrinsic terms but also as fundamental basis on which the economy and future development of the country depend.
- Greater public awareness of importance of protecting and conserving ecosystem goods and services.
- Greater public awareness of ways to prevent negative impacts on biodiversity and ecosystems.
- More technologically trained and able workforce.
- More technologically able and informed decision makers and key players and stakeholders.
- Enhanced international and regional cooperation and information sharing.
- Improved fresh water supply both in terms of quantity of available fresh water resources and in its quality.
- Improvement in health of populace, particularly in terms of improved nutrition and decrease in gastrointestinal disorders.
- Cleaner and healthier environment for all.

2.6 Budget

Co-financing

Name of Co-financier	Sources of Co-financing	Type of Co-financing	Amount
Ministry of Environment and Natural Resources	National government agency	In-kind	2,500,000
	Total co-financing		**$2,500,000**

Component Management Budget.(Data below need to be adjusted to the up-dated Budget / September 2018 / 3 years Timeline). See Annex 3.3: Budget in UNEP format.

Cost Items	Total Estimated person weeks	GEF (US$)	Co-financing (US$)	Project total (US$)
National Coordinator (25% time)				
Technical Coordinator				
Administrator				
Secretarial support (25%)				

Website manager (25%)				
Equipment				
Supplies				
Communications				
Field missions				
Project Steering Committee meetings				
Total				

Consultants working for technical assistance in the Subproject Description:

Activity	Estimated person weeks	GEF($)	Co-financing (US$)	Project total (US$)
C2.1.1 Identify and assess the problems and sources of pollution impacting the Higüamo River. C2.1.2 Identify human health risks for selected communities resulting from polluted freshwater and coastal waters. C2.1.3 Identify priorities to manage and guide investments in efficient natural resource and ecosystem management. C2.2.1 Select the environmental and socioeconomic indicators to be used for monitoring and assessing water quality in the watershed and the effectiveness of project interventions, taking into account the requirements of the Aruba Protocol on LBS.				
C1.1.1 Prepare a master plan for the integrated management Higüamo River watershed and estuarine zone, taking into account innovative adaptations to climate change and sensitive ecosystems.				
C3.1.1 Improve coordination between the sectors involved				

Activity	Estimated person weeks	GEF($)	Co-financing (US$)	Project total (US$)
in the management of water resources, including coastal zone waters. C3.1.2 Assess existing legislation relevant to the integrated management of the Higüamo River watershed and its estuarine zone. C3.1.3 Assess existing policies relevant to the integrated management of the Higüamo River watershed and its estuarine zone. C3.1.4 Assess the feasibility of restructuring and integrating institutions most closely linked to the integrated management of Higüamo River watershed and its estuarine zone.				
C1.2.3 Develop and apply guidelines for small wastewater treatment systems. C1.2.4 Develop water safety plans for small public water supply systems. C1.3.7 Implement a pilot project on solid waste management in a selected community within the watershed. C1.3.8 Implement a pilot project on wastewater treatment in a selected community/ area within the watershed.				
C1.3.1 Create a habitat conservation program for ecosystems and threatened species in the watershed and its estuarine zone (C1.5). C1.3.2 Promote ecotourism in the watershed and its estuarine zone.				
C1.2.1 Develop guidelines for coastal bioengineering and				

Activity	Estimated person weeks	GEF($)	Co-financing (US$)	Project total (US$)
reforestation. C1.2.2 Develop guidelines for watershed reforestation. C1.3.3 Reforest critical areas within the watershed, with particular attention given to mangroves.				
C1.3.5 Strengthen the implementation of the National Emergency Plan, taking into account climate change related disasters, including hurricanes, floods and landslides, as well as land degradation.				
C1.3.4 Promote good fishing practices in the watershed and estuarine zone.				
C1.2.5 Develop a plan for reducing water pollution from land-based activities in the watershed.				
Total				

Consultants to be hired for thisSubproject:

Position Titles	$/person week	Estimated person weeks	Tasks to be performed
For Sub-Project Management			
Local			
Technical Coordinator			Overall technical supervision and coordination of the sub-project component for the Dominican Republic; serve as secretary of the National Project Steering Committee (NPSC); implement the decisions of the NPSC; support the National Coordinator in providing UNEP/CAR RCU and MIMARENA with periodic narrative and administrative reports on the status of implementation of the sub-project.
Administrator			Provide administrative support for the

Position Titles	$/person week	Estimated person weeks	Tasks to be performed
			implementation of the project.
-	-	-	-
International			
For Technical Assistance			
Local			
Baseline and indicators consultant			Provide technical assistance for the implementation of activities C2.1.1, C2.1.2, C2.1.3 and C2.2.1.
Expert in land use planning and geographic information systems			Provide technical assistance for the implementation of activity 1.1.1.
Specialist in environmental policy, law and institutions			Provide technical assistance for the implementation of activities C3.1.1, C3.1.2, C3.1.3 and C3.1.4.
Sanitary engineer specialized in wastewater and solid waste treatment			Provide technical assistance to activities C1.2.3, C1.2.4, C1.3.7 and C1.3.8.
Specialist in protected areas and ecotourism			Provide technical assistance for the implementation of activitiesC1.3.1 and 1.3.2.
Specialist on reforestation and ecosystem restoration			Provide technical assistance for the implementation of activities C1.2.1, C1.2.2 and C1.3.3.
Specialist in disaster management, including disasters caused by climate change			Provide technical assistance to the implementation of activity C1.3.5.
Specialist in best practices in fishing			Provide technical assistance for the implementation of activity C3.1.4.
-	-	-	-
International			
Expert on land-based sources of pollution			Provide technical assistance for the implementation of activity C1.2.5.

2.7 Project Timeline

Please see Annex 3.4.(3 years timeline)

2.8 Risk Analysis

Risk	Rating	Risk management strategy
Unexpected weather conditions, including from extreme events such as hurricanes and droughts, could delay project activities.	M	The project's intervention strategy is based on an ecosystem approach. The resulting increase in ecosystem resilience (water conservation, soil stabilization, climate regulation) will go a long way in sustainably providing stakeholders with a more solid foundation to withstand any extreme climatic events, such as droughts and flooding which may be exacerbated by climate change. Although no significant external risks derived from the consequences of climate change are foreseen to jeopardize the success of the proposed intervention, climate adaptation and vulnerability assessments will be made by the project to stay abreast of any potential associated problems or limitations.
The slow process of acquisition.	M	This can be addressed by (a) developing early on in the implementation of the project a purchasing plan for the acquisition of equipment and (b) timely project implementation.
Poor commitment and engagement of stakeholders in participating in project implementation.	L	A Stakeholder Advisory Committee will be established to fully engage stakeholders from the public and private sector in assisting in the guidance of the project and in providing support to its implementation.
Poor inter-institutional coordination affecting negatively the achievement of integrated watershed and coastal area management in support of biodiversity conservation and sustainable use.	M	Project activities C3.1.1 to C3.1.4 on strengthening the policy, institutional, legal and regulatory frameworks will be implemented with a view to improving inter-institutional coordination and cooperation in integrated watershed and coastal zone management.
Sub-project partners fail to deliver expected outputs.	L	The full engagement of all sub-project partners will be achieved by ensuring an effective sub-project steering committee supported by an efficient national coordination unit. The public projection of sub-project achievements through an effective communication strategy by the SPSC and the NCU and the subsequent "good press" generated will be an incentive to sub-

		project partners to deliver their expected outputs.
Poor follow-up implementation by sub-project partners following sub-project completion.	M	Based on experiences from other GEF projects, sub-project partners will be urged to incorporate the follow-up to sub-project activities into their respective programmesof work.

2.9 Sustainability

Project sustainability will be achieved through different avenues:

- First, national and local authorities participating in project implementation will be urged to mainstream sub-project activities and relevant aspects of the integrated watershed and coastal zone management of the Higüamo River, including the application of environmental management tools, supportive financial mechanisms and ecosystem and natural resources monitoring activities, into their work programmes, plans and strategies.

- Second, capacity-building activities in long-term integrated watershed and coastal area management for biodiversity conservation and sustainable use will help build the necessary knowledge foundation and expertise to continue to further develop, refine and apply corresponding regulatory frameworks and environmental management tools, as well as strengthening capacity in environmental monitoring, assessment and enforcement by participating national and local authorities and stakeholders.

- Third, through the project's information dissemination and replication activities under project component 4, the findings, including lessons learned, and the tools and methodologies developed and applied will be disseminated to other projects, programs and areas in the country for replication.

- Fourth, by improving the livelihoods of local communities through improved sustainable use of natural resources and ecotourism, it is expected that the project's tools and methodologies, as well as good practices in agriculture, cleaner production and ecosystem management, will continue to be practiced, refined and further developed, particularly if the necessary technical support and follow-up continues to be provided by participating national and local authorities and stakeholder organizations.

- Finally, sound land use management and improved management of ecosystems, including protected areas, as well as the rehabilitation and restoration of natural ecosystems, will result in the expansion of habitat for the islands rich biodiversity and endemic species, which will serve as a key element of a strategy for the long-term conservation and sustainability of Cuba's biodiversity.

The involvement of a wide range of stakeholders, including universities, scientific and technical institutions, local authorities and farmers organizations, among others, in project activities as well as in the dissemination of informationabout project findings and lessons learned will have a multiplier effect and will contribute to widersustainability.

The successful development of activities promoting the sustainable use of freshwater, land and biodiversity in project intervention areas will help improve the livelihoods of many members of local communities and at the same time help sustain the utilization, refinement and further development of biodiversity conservation and sustainable use tools and methodologies and good practices in agriculture and natural resource management.

2.10 Replicability

Under project component 4, capacity building will be undertaken for disseminating the lessons learned in this project to other projects, programs and areas, which will also contribute to the project's sustainability, including through presentations at major conferences. A public education and awareness programme will also be developed during the sub-project's inception phase for effectively involving local communities in integrated watershed and coastal zone management in the project's intervention areas and throughout the Dominican Republic.

Sub-project components cover key issues that are faced through much of the Dominican Republic, as well as by several countries throughout the Wider Caribbean. Ecosystem rehabilitation and restoration sites in particular will involve monitoring and analysis that will enable replication of these activities. Policies, plans and strategies developed through the project will also serve as examples for other countries to replicate. Innovations such as the development of education and public awareness materials on biodiversity conservation and sustainable use directed at national and local authorities and communities can also be replicated.

2.11 Execution Arrangements

The project will establish a Sub-Project Steering Committee (PSC) consisting of the Ministry of Environment (MIMARENA), INDRHI, INAPA, the Ministry of Health, and the Ministry of Agriculture. The PSC may also include other major co-financing and implementing partners. The PSC, presided by MIMARENA will be responsible for managing the execution of project activities, including reviewing and advising on the main outputs of the sub-project, ensuring that the Government's environmental policy is fully reflected in the FSP, ensuring effective communication and decision-making, and assisting with mobilization of expertise as needed for proper execution of FSP sub-project outputs. On an annual basis the PSC will meet with all executing partners to fulfill steering mechanism responsibilities including: oversight of project implementation, monitoring of project progress, strategic and policy guidance and to review and approve annual work plans and budgets. Please see Annex 3.5.1 for additional details on the project structure.

In carrying out its work, MIMARENA and the PSC will be advised by an Advisory Stakeholder Committee with representatives of local authorities, communities and organizations in the project's intervention areas.

MIMARENA, UNEP/CAR-RCU and CARPHA (through its Environmental Health and Sustainable Development Department – EHSD) have spearheaded the development of the project and will play a leading role in implementing and monitoring the project and maintaining its strategic focus.

The Ministry of the Environment and Natural Resources as the project National Executing Agency (NEA) will be responsible for implementing the project in accordance with the components outlined in Section 2.4. UNEP, as the GEF Implementing Agency (IA), will be responsible for overall project supervision to ensure consistency with GEF and UNEP policies and procedures, and will provide guidance on linkages with related UNEP and GEF funded activities. UNEP CAR-RCU and CARPHA (EHSD Department) will monitor implementation of the activities undertaken during the execution of the project. UNEPCAR-RCU will also be responsible for clearance and transmission of financial and progress reports to the GEF.

As the NEA, MIMARENA will cooperate with UNEP so as to allow the organization to fulfill its responsibility as IA accountable to the GEF. To this end, free access to all relevant information will be provided by the Ministry. The NEA will also convene the Sub-Project Steering Committee (PSC) and will appoint a National Project Coordinator (NPC), also referred to as the Executive Project Director. In conjunction with the NPC, the Ministry in consultation with CARPHA and UNEPCAR-RCU will establish reporting guidelines for all partners and specialists (technical assistance consultants) and ensure that they submit quality reports. The NEA and NPC will collaborate to prepare biannual progress reports, quarterly financial reports and annual summary progress reports for UNEP.

The NPC supported by a Technical Coordinator (TC)will be responsible for coordinating, managing and monitoring the implementation of the FSP sub-project for the Dominican Republic conducted by local experts, consultants, subcontractors and implementing partners. The NPC with the support of the Technical Coordinator will also coordinate and oversee the preparation of the FSP outputs, manage FSP finances, oversee overall resource allocation, and, where relevant, submit proposals for budget revisions to the PSC and UNEP.

2.12 Communications and Dissemination Mechanisms

Public awareness and communication are an integral part of this project, particularly since reaching and persuading local communities about the importance and value of the project is key to its success. A communications strategy aimed at a broad range of potential beneficiaries will be developed to aid in (i) informing about the importance of the region's ecosystems and the services they provide, (ii) promoting the use of biodiversity conservation and sustainable use tools and methodologies, (iii) disseminating information on project activities related to good practices in agriculture and natural resource management, (iv) strengthening and expanding the natural resource base in project intervention areas and (v) raising awareness of the potential socioeconomic benefits for the region's inhabitants.

Ecosystem rehabilitation and restoration sites will be used to demonstrate and raise awareness of options and opportunities for improving the productivity of ecosystems and agro-ecosystems and for strengthening the sustainable management of the region's freshwater, land and biodiversity and the management of its protected areas. This will include the development of public awareness information and education materials directed at local stakeholders that can be used to help in biodiversity conservation, better management of natural resources, increased productivity of agro-ecosystems and rehabilitation and restoration of degraded ecosystems.

Tools for achieving increased awareness and communications will include:

- Regular communication and meetings with partner agencies and stakeholders involved in the implementation of project components;

- Reporting to key government agencies and bodies;

- Public availability of project deliverables including maps, briefings, and training manuals, among others;

- Community meetings and school presentations, particularly for updates on pilot demonstrations and presentations on deliverables once completed;

- As part of Component 4, a communications strategy, including dissemination of knowledge management developed and implemented with the added intent of highlighting the achievements of successful project activities.

2.13 Monitoring and Evaluation (M&E)

The project will be monitored through the following M&E activities:

A Project Inception Workshop will be held within the first 3 months of project start with those with assigned roles in the project organization structure, representatives of the Executing Agencies (UNEP and CARPHA) and, where appropriate/feasible, regional technical policy and program 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.

The Inception Work shop will address a number of key issues including:

a . Assist all partners to fully understand and take ownership of the project.

b. Detail the roles, support services and complementary responsibilities of UNEPCAR and RCU staff vis-à-vis the project team.

c. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms.

d. The Terms of Reference for project staff will be discussed again as needed.

e. Based on the project results framework kind their relevant GEF Tracking Tool if appropriate, finalize the first annual work plan. Review and agree on project performance indicators, targets and their means of verification, and recheck assumptions and risks.

f. 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.

g. Discuss financial reporting procedures and obligations, and arrangements for annual audit.

h. Plan and schedule Project Steering Committee meetings. Roles and responsibilities of all project organization structures should be clarified and meetings planned. The first Project Steering Committee meeting should be held within the first 12 months following the inception workshop.

An Inception Work shop 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 and Annual project progress reports as will be outlined in the project agreement. The reports will include, but are not limited to: (a) Progress made toward project objective and project outcomes-each with indicators, baseline data and end-of-project targets (cumulative); (b) Project outputs delivered per project outcome (annual); (c) Lessons learned/good practices; (d) AWP and other expenditure reports; (e) Risk and adaptive management; (f) 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: the UNEP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan tassess first hand project progress. Other members of the PSC may also join these visits. A Field Visit Report will be prepared by UNEP/CARRCU and will be circulated no less than one month after the visit to the project team and PSC members.

Mid-term of project cycle: 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. I twill focus on the effectiveness, efficiency and time lines of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Finding soft his review will be incorporated as recommendations for enhanced implementation during the final half of the project‘ sterm. 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 UNEP based on guidance from the Regional Coordinating Unit and the GEF. The relevant GEF Focal Area Tracking Tools will also be completed during the mid-term evaluation cycle.

End of Project: An independent Final Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNEP and GE 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 guidance from the Regional Coordinating Unit and the GEF.

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: Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums. The project will identify and participate, as relevant and appropriate, 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. Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

3 PROJECT ANNEXES

Annex 3.1: CostedSub-project Outline. **(Data below need to be adjusted to the up-dated Budget / September 2018 /3 years Timeline). See Annex 3.3: Budget in UNEP format.**

COMPONENT 1. National Sub-project 1.3: Dominican Republic	GEF Funding	Co-Financing	Total component Cost
Component 1: Deveeloping and implementing approaches for the integrated management and maintenance of ecosystem services of the Higüamo River watershed			
Sub-component 1.1: Developing an integrated management plan for the Higüamo River watershed and estuarine zone			
Activity 1.1.1.1 Prepare a master plan for the integrated management Higüamo River watershed and estuarine zone, taking into account innovative adaptations to climate change and sensitive ecosystems.			
Activity 1.1.1.2 Develop necessary professional skills at the national and/or local levels to support project implementation.			
Sub-component 1.2: Supportive plans and guidelines			
Activity 1.2.1.1 Develop guidelines for coastal bioengineering and reforestation.			
Activity 1.2.1.2 Develop guidelines for watershed reforestation.			
Activity 1.2.1.3 Develop and apply guidelines for small wastewater treatment systems.			
Activity 1.2.1.4 Develop water safety plans for small public water supply systems.			
Activity 1.2.1.5 Develop a plan for reducing water pollution from land-based activities in the watershed.			
Activity 1.2.1.6 Develop and apply a good agricultural practices (GAP) protocol for the management and control of organic waste.			
Activity 1.2.1.7 Develop guidelines for bioengineering for slope stabilization, runoff control and aquifer replenishment.			
Sub-component 1.3: Environmental restoration and sustainable use measures for improved wastewater management, increased access to safe water and enhanced ecosystem services			
Activity 1.3.1.1 Create a habitat conservation program for ecosystems and threatened species in the watershed and its estuarine zone.			
Activity 1.3.1.2 Promote ecotourism in the watershed and its estuarine zone.			
Activity 1.3.1.3 Reforest critical areas within the watershed, with particular attention given to mangroves.			
Activity 1.3.1.4 Promote good fishing practices in the watershed and estuarine zone.			
Activity 1.3.1.5 Strengthen the implementation of the National Emergency Plan, taking into account climate change related disasters, including hurricanes, floods and landslides, as well as land degradation.			
Activity 1.3.1.6 Install and assess the effectiveness of rainwater harvesting systems.			
Activity 1.3.1.7 Implement a pilot project on solid waste management in a selected community within the watershed.			

COMPONENT 1. National Sub-project 1.3: Dominican Republic	GEF Funding	Co-Financing	Total component Cost
Activity 1.3.1.8 Implement a pilot project on wastewater treatment in a selected community/ area within the watershed.			
Component 2: Assessing problems and identifying priorities for improving the management of the land, water and biodiversity resources of the Higüamo River watershed and its associated coastal zone, taking into account climate change, sensitive ecosystems and ecosystem services			
Sub-component 2.1: Identifying priority problems and sources of pollution			
Activity 2.1.1.1 Identify and assess the problems and sources of pollution impacting the Higüamo River.			
Activity 2.1.1.2 Identify human health risks for selected communities resulting from polluted freshwater and coastal waters.			
Activity 2.1.1.3 Identify priorities to manage and guide investments in efficient natural resource and ecosystem management.			
Sub-component 2.2: Monitoring and assessment of project interventions and capacity building to support project implementation			
Activity 2.2.1.1 Select the environmental and socioeconomic indicators to be used for monitoring and assessing water quality in the watershed and the effectiveness of project interventions, taking into account the requirements of the Aruba Protocol on LBS.			
Activity 2.2.1.2 Establish a monitoring program based on the selected indicators for periodically assessing the quality of freshwater and coastal seawater.			
Component 3: Strengthening of policies and legal and institutional frameworks and capacity building for sustainable land management, integrated management of water resources and the management of ecosystem services, taking into account climate change			
Sub-component 3.1: Policies and legal and institutional frameworks			
Activity 3.1.1.1 Improve coordination between the sectors involved in the management of water resources, including coastal zone waters.			
Activity 3.1.1.2 Assess existing legislation relevant to the integrated management of the Higüamo River watershed and its estuarine zone.			
Activity 3.1.1.3 Assess existing policies relevant to the integrated management of the Higüamo River watershed and its estuarine zone.			
Activity 3.1.1.4 Assess the feasibility of restructuring and integrating institutions most closely linked to the integrated management of Higüamo River watershed and its estuarine zone.			
Sub-component 3.2: Capacity-building			
Activity 3.2.1.1 Raise awareness among public officials and stakeholders in municipal governments, local government agencies and organizations of the elements and actions required for IWCAM.			
Activity 3.2.1.2 Organization of a training program directed at public officials and stakeholders, including private industry, on IWCAM and to disseminate project information and lessons learned within the Higüamo River watershed and estuarine zone.			
Component 4: Sharing of project information, lessons learned and good practices, and promoting project replication			

COMPONENT 1. National Sub-project 1.3: Dominican Republic	GEF Funding	Co-Financing	Total component Cost
Subcomponent 4.1: Dissemination of information, good practices and lessons learned and project replication			
Activity 4.1.1.1 Produce project publications for disseminating scientific and technical information, assessments and analyses, lessons learned and best practices, among others (C1.7).			
Activity 4.1.1.2 Organize two major technical conferences to demonstrate innovative solutions implemented by the project (C1.7).			
Activity 4.1.1.3 Disseminate project information, experiences and lessons learned to a wider audience of government officials and stakeholders at the national level.			
Activity 4.1.1.4 Exchange information on experiences and lessons learned with other SIDs.			
Activity 4.1.1.5 Engage stakeholders at the national level in applying good agricultural practices, best fishing practices and best environmental practices in the field.			
Activity 4.1.1.6 Develop and maintain a website for providing up-to-date information on progress in project implementation, including achievements and lessons learned, and replication.			
Activity 4.1.1.7 Promote equitable gender participation in project implementation and replication.			
TOTAL	**1,430,646**	**2,500,000**	**3,930,646**

Annex 3.2 Logical Framework and Objectively Verifiable Impact Indicators

Dominican Republic Sub-component

Objective: To conserve and sustainably use biodiversity through the strengthening of national capacities for the integrated management of the Higüamo River watershed, including the maintenance, restoration and sustainability of ecosystem services, supported by appropriate policies, institutional reforms, legislation, as well as by the application of supportive efficient and effective technologies.					
National component Outcome:	**Indicator**	**Baseline**	**Target**	**Sources of verification**	**Risks and Assumptions**
Component 1: Developing and implementing approaches for the integrated management and maintenance of ecosystem services of the Higüamo River watershed					
Outcome 1.1: The integrated management of the Higüamo River watershed and its estuarine zone	Agreement on a comprehensive policy framework for achieving the integrated management of the biodiversity, water and land resources of the watershed and its associated coastal zone.	Current management efforts are fragmented and a policy framework for the management of the watershed and its estuarine zone is missing.	Have a draft of a master plan for the integrated management of the Higüamo River watershed and associated coastal zone ready for formal consultations within the government by the mid-term of the sub-project; reach formal agreement by the end of the third year.	A government-adopted master plan for the integrated management of the Higüamo River watershed and associated coastal zone.	Risks: Inability of government agencies to agree on a clarification and distinction of respective roles within the master plan. Assumptions: Commitment by government agencies and local authorities to resolving the environmental problems threatening the watershed, its biodiversity and the livelihoods of its inhabitants.
Output 1.1.1.1: A master plan for the integrated management of the Higüamo River watershed and its estuarine zone	Agreement on a comprehensive policy framework for achieving the integrated management of the biodiversity, water and land resources of the watershed and its associated coastal zone.	Current management efforts are fragmented and a policy framework for the management of the watershed and its estuarine zone is missing.	Have a draft of a master plan for the integrated management of the Higüamo River watershed and associated coastal zone ready for formal consultations within the government by the mid-term of the sub-project; reach formal agreement	A government-adopted master plan for the integrated management of the Higüamo River watershed and associated coastal zone.	Risks: Inability of government agencies to agree on a clarification and distinction of respective roles within the master plan. Assumptions: Commitment by government agencies and local authorities to resolving the environmental problems threatening the watershed, its biodiversity and the livelihoods

			by the end of the third year.		of its inhabitants.
Output 1.1.1.2: Trained professionals in participating partner agencies (government agencies, municipalities) and civil society organizations (universities, NGOs, etc.) trained by year 4 in key technical areas related to the development and implementation of project interventions for future replication and integration within national frameworks	Greater technical capacity in support of project implementation.	Sub-project staff needs to be trained on the issues to be addressed and methodology and tools to be utilized in project implementation, particularly as relates to monitoring and assessment.	At least 60% of the professionals in participating partner agencies (government agencies, municipalities) and civil society organizations (universities, NGOs, etc.) are trained in key technical areas related to the development and implementation of project interventions	Project report on results of training.	Risks: Inadequate participation of relevant staff in partner organizations due to conflicting commitments. Assumptions: Partner organizations will be firm in meeting their commitments in support of sub-project implementation.
Outcome 1.2: Improved health of freshwater and estuarine ecosystems, ecosystem restoration and improved provision of ecosystem services	Scientifically verifiable information and data generated by the sub-project's monitoring and assessment program on the overall health of the watershed's wetlands and associated ecosystems and the biodiversity they contain.	The lower course of the Higüamo River and its estuarine zone is heavily contaminated, having major negative impacts on the region's biodiversity.	Finalization of three sets of guidelines for ecosystem restoration and reforestation in support of a master plan for the integrated management of the Higüamo River watershed and associated coastal zone.	Sub-project reports on the development and use of three sets of guidelines for ecosystem restoration and reforestation in support of a master plan for the integrated management of the Higüamo River watershed and associated coastal zone.	Risks: None foreseen. Assumptions: Cooperation of government agencies and stakeholders, particularly NGOs, who will be engaged in the sub-project's ecosystem restoration and reforestation activities.
Output 1.2.1.1: Guidelines for watershed restoration	Guidelines are being actively used by sub-project partners.	Reforestation of mangroves and broadleaf forests by MIMARENA and NGOs has been underway the last five years with 160,000 trees being planted, or approximately 100 hectares. Nonetheless, much more needs to be done.	Completion of the guidelines by the end of the seventh month of sub-project implementation.	Agreed upon guidelines for watershed restoration.	Risks: None foreseen. Assumptions: Cooperation of government agencies and stakeholders, particularly NGOs, who will be engaged in the sub-project's watershed restoration activities.

		Although several private sector industries have installed wastewater treatment plants, the lower course of the river and its estuarine zone is heavily contaminated.			
Output 1.2.1.2: Guidelines for coastal bioengineering and reforestation	Guidelines are being actively used by sub-project partners.	Reforestation of mangroves and broadleaf forests by MIMARENA and NGOs has been underway the last five years with 160,000 trees being planted, or approximately 100 hectares. Nonetheless, much more needs to be done.	Completion of the guidelines by the end of the sixth month of sub-project implementation.	Agreed upon guidelines for coastal bioengineering and reforestation.	Risks: None foreseen. Assumptions: Cooperation of government agencies and stakeholders, particularly NGOs, who will be engaged in the sub-project's ecosystem restoration and reforestation activities.
Output 1.2.1.3: Guidelines for bioengineering for slope stabilization, runoff control and aquifer replenishment.	Guidelines are being actively used by sub-project partners.	Reforestation of mangroves and broadleaf forests by MIMARENA and NGOs has been underway the last five years with 160,000 trees being planted, or approximately 100 hectares. Nonetheless, much more needs to be done.	Completion of the guidelines by the end of the sixth month of sub-project implementation.	Agreed upon guidelines for bioengineering for slope stabilization, runoff control and aquifer replenishment.	Risks: None foreseen. Assumptions: Cooperation of government agencies and stakeholders, particularly NGOs, who will be engaged in the sub-project's ecosystem restoration and reforestation activities.
Outcome 1.3: Reduced risk of polluted waters and improved access to safe water, including through the proper treatment of wastewater and solid wastes	Scientifically verifiable information from the sub-project's monitoring and assessment program that water pollution is being mitigated/eliminated.	Although several private sector industries have installed wastewater treatment plants, the lower course of the river and its estuarine zone is heavily contaminated from municipal wastewater, untreated industrial discharges and non-point sources of	Finalization of the following in support of a master plan for the integrated management of the Higüamo River watershed and associated coastal zone: • Guidelines for small wastewater treatment plants,	Sub-project reports on the development and use of: • Guidelines for small wastewater treatment plants, • A plan for reducing land-based sources of water pollution,	Risks: None foreseen. Assumptions: Cooperation of government agencies and stakeholders, particularly NGOs, who will be engaged in the sub-project's watershed restoration activities.

		pollution (fertilizers and pesticides)	• A plan for reducing land-based sources of water pollution, • A protocol for the management and control of organic waste from cattle broken down by worms.	• A protocol for the management and control of organic waste from cattle broken down by worms.	
Output 1.3.1: Guidelines for small wastewater treatment systems	Scientifically verifiable information from the sub-project's monitoring and assessment program that water pollution is being mitigated/eliminated.	Although several private sector industries have installed wastewater treatment plants, the lower course of the river and its estuarine zone is heavily contaminated from municipal wastewater, untreated industrial discharges and non-point sources of pollution (fertilizers and pesticides)	Completion of the guidelines by the end of the eighth month of sub-project implementation.	Agreed upon guidelines for small wastewater treatment systems.	Risks: None foreseen. Assumptions: Cooperation of government agencies and stakeholders, particularly NGOs, who will be engaged in the sub-project's watershed restoration activities.
Output 1.3.2: A plan for reducing land-based sources of water pollution	Scientifically verifiable information from the sub-project's monitoring and assessment program that water pollution is being mitigated/eliminated.	Runoff from the use of fertilizers and pesticides in agriculture are impacting the length of most of the river, with municipal wastewater, industrial discharges and litter affecting the lower course and estuarine zone.	Completion of a plan for reducing land-based sources of water pollution by the end of the eighth month of sub-project implementation	An agreed upon plan for reducing land-based sources of pollution impacting the Higüamo River watershed and estuarine zone.	Risks: Potential disagreements on sub-project partners on how to address land-based sources of pollution originating in the watershed and its estuarine zone. Assumptions: Cooperation of government agencies and stakeholders, particularly NGOs, who will be engaged in the sub-project's watershed restoration activities.
Output 1.3.3: A good agricultural practices	Increased use of organic fertilizers from manure	This technology is being promoted in the country	Completion of the protocol by the end of	An agreed upon good agricultural practices	Risks: None foreseen. Assumptions: Cooperation from

protocolfor the management and control of organic waste, from cattle, broken down by worms	broken down by worms.	but needs to be expanded in the watershed to reduce dependence on chemical fertilizers that are a source of pollution of wetlands.	the seventh month.	protocol for the management and control of organic waste, from cattle, broken down by worms	the Ministry of Agriculture and farmers in project intervention areas.
Outcome 1.4*:* Reduced vulnerability to drought and other climate change impacts	Preparedness of regional and local authorities to combat threats to access of safe water, particularly those resulting from climate change.	The quality of surface freshwater in the watershed has continued to decline, particularly in the lower course of the river. Consequently, groundwater resources, which provide most drinking water, are being dangerously reduced.	Completion of water safety plans for selected communities by the end of the twelfth month.	Number of agreed-upon water safety plans.	Risks: Inadequate resources of local agencies to implement water safety plants. Assumptions: Commitment of local authorities, the private sector and NGOs to support water safety plans.
Output 1.4.1: Water safety plans	Preparedness of regional and local authorities to combat threats to access of safe water, particularly those resulting from climate change.	The quality of surface freshwater in the watershed has continued to decline, particularly in the lower course of the river. Consequently, groundwater resources, which provide most drinking water, are being dangerously reduced.	Completion of water safety plans for selected communities by the end of the twelfth month.	Number of agreed-upon water safety plans.	Risks: Inadequate resources of local agencies to implement water safety plants. Assumptions: Commitment of local authorities, the private sector and NGOs to support water safety plans.
Outcome 1.5: Enhancing the socio-economic welfare of selected communities through interventions leading to (a) improved economic opportunities resulting from the conservation and sustainable use of biodiversity and other natural resources, (b) safer access to water and enhanced ecosystem services by	Livelihoods of selected communities will be improved as a result of the conservation and sustainable use of biodiversity, greater access to safe drinking water and greater preparedness for natural disasters, including those resulting from climate change.	The livelihoods of much of the population in the watershed are at risk from the degradation of biodiversity, water and land resources; poor access to safe water; and exposure to natural disasters (hurricanes and droughts) and man-made disasters (industrial spills and accidents).	Design and implementation of project interventions on biodiversity conservation and sustainable use, ecosystem restoration and reforestation, good fishing practices, harvesting of rainwater, wastewater treatment, solid waste management and preparedness for	Sub-project reports on sub-project interventions. Inspection and assessment of sub-project intervention sites.	Risks: Poor engagement of local authorities and stakeholders; inadequate resources available at the local level; Economic benefits of the sustainable use of biodiversity are perceived as inadequate. Assumptions: Support of public and private sector stakeholders; successful selection of the selected communities for the pilot projects.

effectively addressing water contamination from agriculture, industry and municipal wastewater and (c) greater preparedness in response to natural disasters, including those resulting from climate change			natural and man-made emergencies.		
Output 1.5.1: A conservation program for ecosystems and threatened species, taking into account protection measures, training requirements, control of invasive species and relocation of domestic animals	An expanded conservation program for the watershed and its estuarine zone that contributes to the improvement of the livelihoods of local communities.	The current conservation program is inadequate for protecting the rich biodiversity of the watershed and its associated coastal zone.	Watershed conservation program by the end of the 13th month of sub-project implementation.	An agreed upon watershed conservation program for ecosystems and threatened species, taking into account protection measures, training requirements, control of invasive species and relocation of domestic animals.	Risks: Lack of engagement by local farmers and forest owners; poor engagement of local authorities. Assumptions: Support of public and private sector stakeholders.
Output 1.5.2: A proposal for the establishment of new protected areas	An expanded conservation program for the watershed and its estuarine zone that contributes to the improvement of the livelihoods of local communities.	Only 19.9 km2, or 1.68% of the watershed, has been set aside as protected. Forests and woodlands account for 272.74, or 14.73% of the watershed's surface areas.	Proposals for the establishment of new protected areas in the watershed and its associated coastal area.	Creation of a new protected areas.	Risks: Lack of engagement by local farmers and forest owners; poor engagement of local authorities. Assumptions: Support of public and private sector stakeholders.
Output 1.5.3: The establishment of an ecotourism route in the Higüamo River watershed and its estuarine zone making use of existing Wildlife Refuges	Improved livelihoods of participating local communities. Due to the sustainable use of biodiversity.	Recreational ecotourism to protected areas exists. However, there is no income-generating ecotourism operating in the watershed.	Completion of a proposed ecotourism route by the end of the 16th month of sub-project implementation.	Establishment of an ecotourism route in the Higüamo River watershed and its estuarine zone making use of existing Wildlife Refuges and new protected areas. Agreements with the tourism industry, including hotels and tour	Risks: Economic benefits of the ecotourism route are perceived as inadequate. Assumptions: Commitment by tourism agencies, the hotel industry and local authorities and stakeholders.

				agencies, for the promotion of ecotourism throughout the watershed and its associated coastal zone.	
Output 1.5.4: The reforestation of critical watershed areas	Increase in the forest cover of the watershed and its associated coastal zone.	Reforestation of mangroves and broadleaf forests by MIMARENA and NGOs has been underway the last five years with 160,000 trees being planted, or approximately 100 hectares. Nonetheless, much more needs to be done.	Planting of 800,000 trees leading to the reforestation of 500 hectares in priority areas.	Sub-project report on reforestation in the watershed and its associated coastal zone.	Risks: Extreme weather events such as hurricanes and droughts that can damage reforested areas; delays in the provision of funding for reforestation that needs to be undertaken during a specific season. Assumptions: Cooperation of government agencies and stakeholders, particularly NGOs, who will be engaged in the sub-project's ecosystem restoration and reforestation activities.
Output 1.5.5: A project report on the results of the application of good fishing practices in project intervention areas	Guidelines are being actively used by sub-project partners and local fishermen.	Fishing in the lower course and estuarine zone of the river is non-existent due to water pollution. Fishing is concentrated along the coastal and marine zone beyond the river's estuarine zone.	• Identification of areas most vulnerable to unsustainable fishing in the watershed and its associated coastal zone. • Guidelines of good fishing practices appropriate for the watershed and its estuarine zone.	Project report on the results of the application of good fishing practices in project intervention areas.	Risks: Failure to effectively engage local fishermen. Assumptions: Strong commitment by MIMARENA and NGOs; support from consumers of seafood and freshwater fish and crustaceans.
Output 1.5.6: A project report on measures taken in support of the implementation of the	Preparedness by local communities for natural disasters affecting the	Although a National Emergency Plan exists, there is no regional	Completion of a proposed emergency plan for the watershed	An adopted emergency plan for the Higüamo River watershed and	Risks: None foreseen. Assumptions: Commitment by

National Emergency Plan: an emergency plan for the Higüamo River watershed and estuarine zone.	watershed and its associated coastal area.	emergency plan that focuses on the watershed and its associated coastal zone.	and its associated coastal zone by the end of the 25th month.	associated coastal zone, taking into account the impacts of climate change.	government agencies, local authorities, the private sector and NGOs.
Output 1.5.7: Installed rainwater harvesting systems	Improved access to safe drinking water.	Many local communities do not have access to safe drinking water due to polluted surface waters and to being disconnected from public water systems.	Provide access to safe water to a selected community through a pilot demonstration project for harvesting rainwater, with 30-50 households being benefitted.	Sub-project report on the pilot project on harvesting systems.	Risks: Inadequate maintenance of the rainwater harvesting systems. Assumptions: Commitment of local authorities; successful selection of the selected community for the pilot project.
Output 1.5.8: Annual project reports on the status of implementation and achievement of one pilot project on solid waste management in a selected community	Improved management of solid waste in one selected community.	Solid waste management is inadequate throughout much of the watershed and its estuarine zone.	Implementation of a pilot project on solid waste management for a local community commencing at the beginning of the second year of sub-project implementation.	Three annual sub-project reports on the status of implementation and achievement of one pilot project on solid waste management in a selected community.	Risks: Inadequate maintenance of the solid waste management system; inadequate resources available at the local level. Assumptions: Commitment of local authorities; successful selection of the selected community for the pilot project.
Output 1.5.9: Annual project reports on the status of implementation and achievement of one pilot project on wastewater treatment in a selected community	Improved wastewater treatment in one selected community.	Wastewater treatment is inadequate throughout much of the watershed and its estuarine zone.	Implementation of a pilot project on wastewater treatment for a local community commencing at the beginning of the second year of sub-project implementation.	Three annual sub-project reports on the status of implementation and achievement of one pilot project on wastewater treatment in a selected community.	Risks: Inadequate maintenance of the wastewater treatment system; inadequate resources available at the local level. Assumptions: Commitment of local authorities; successful selection of the selected community for the pilot project.
Outcome 1.6*:* ecosystem restoration, improved ecosystem health, improved provision of ecosystem services and improved livelihoods of participating local communities in selected project pilot areas developed	Ecosystem restoration, improved ecosystem health, improved provision of ecosystem services and improved livelihoods of participating local communities in selected project pilot areas	The livelihoods of much of the population in the watershed are at risk from the degradation of biodiversity, water and land resources; poor access to safe water; and exposure to natural	Number of project proposals for pilot projects on ecosystem restoration, improved ecosystem health, improved provision of ecosystem services and improved livelihoods of	Developed project proposals submitted for funding by the GEF Ecosystem Management—Small Grants Program.	Risks: None foreseen. Assumptions: Support of public and private sector stakeholders; successful selection of the selected communities for the pilot projects funded through the GEF Ecosystem Management—Small Grants

through the GEF Ecosystem Management—Small Grants Program.	developed through the GEF Ecosystem Management—Small Grants Program.	disasters (hurricanes and droughts) and man-made disasters (industrial spills and accidents).	participating local communities in selected project pilot areas funded through the GEF Ecosystem Management—Small Grants Program.		Program.
Output 1.6.1: Project proposals for small-scale pilot projects for improved ecosystem management addressing land management, including solid waste treatment; water degradation,; biodiversity degradation; and ecosystem services; as well as improved livelihoods of participating communities due to improved management of natural resources and ecosystems.	Ecosystem restoration, improved ecosystem health, improved provision of ecosystem services and improved livelihoods of participating local communities in selected project pilot areas developed through the GEF Ecosystem Management—Small Grants Program.	The livelihoods of much of the population in the watershed are at risk from the degradation of biodiversity, water and land resources; poor access to safe water; and exposure to natural disasters (hurricanes and droughts) and man-made disasters (industrial spills and accidents).	Number of project proposals for pilot projects on ecosystem restoration, improved ecosystem health, improved provision of ecosystem services and improved livelihoods of participating local communities in selected project pilot areas funded through the GEF Ecosystem Management—Small Grants Program.	Developed project proposals submitted for funding by the GEF Ecosystem Management—Small Grants Program.	Risks: None foreseen. Assumptions: Support of public and private sector stakeholders; successful selection of the selected communities for the pilot projects funded through the GEF Ecosystem Management—Small Grants Program.
National component 2: : Assessing problems and identifying priorities for improving the management of the land, water and biodiversity resources of the Higüamo River watershed and its associated coastal zone, taking into account climate change, sensitive ecosystems and ecosystem services					
Outcome2.1: A knowledge base for the project's programme of work leading to the integrated management of the Higüamo River watershed and its estuarine zone	Policy makers and national stakeholders are aware of key issues that are impacting socio-economic development that are related to challenges associated with biodiversity, water and land management.	Structured baseline information is incomplete and is inadequate for assessing progress in project implementation in the sub-project's intervention areas. Sub-project issues are inadequately addressed in mainstream development planning.	The sub-project will have available the necessary technical analysis within the first 6 months of project implementation. Project intervention areas for addressing priority environmental problems are identified within six months of project inception.	Diagnostic analysis of baseline data evaluating the present environmental state of the watershed and its associated coastal zone. Project report on conflicts between conservation efforts and the unsustainable use of biodiversity resources	Risks: Inadequate coordination among leading government institutions. Assumptions: Strong commitment by government agencies, universities and NGOs.
Output 2.1.1: Identification of priorities to be addressed in the	Policy makers and national stakeholders are aware of	Sub-project issues are inadequately addressed in	The sub-project will have available the necessary	Project report on conflicts between	Risks: Inadequate coordination among leading government

project for guiding investments for achieving efficient and effective land use and ecosystem management.	priorities that need to be addressed in the design of an integrated management plan for the watershed and its estuarine zone leading to the improved management of biodiversity, water and land resources and the livelihoods of selected communities.	mainstream development planning.	technical analysis within the first 6 months of project implementation. Project intervention areas for addressing priority environmental problems are identified within six months of project inception.	conservation efforts and the unsustainable use of biodiversity resources	institutions. Assumptions: Strong commitment by sub-project partners, as well as relevant government agencies, universities and NGOs.
Output 2.1.2: A completed baseline for structuring the project's monitoring and assessment programme.	Design suitability for integrated watershed and coastal area management.	Structured baseline information is incomplete and is inadequate for assessing progress in project implementation.	The sub-project will have available the necessary technical analysis within the first 6 months of project implementation.	Diagnostic analysis of baseline data evaluating the present environmental state of the watershed and its associated coastal zone Completed baseline for structuring the project's monitoring programme.	Risks: Inadequate coordination among leading government institutions. Assumptions: Strong commitment by sub-project partners, as well as relevant government agencies, universities and NGOs.
Output 2.1.3: A project report on human health risks for selected communities	Assessment, classification and localization of human health risks from point sources of pollution.	Current information is incomplete and a comprehensive up-to-date assessment is lacking.	The assessment will be completed within the first six months of project implementation.	Project report on human health risks for selected communities.	Risks: None foreseen. Assumptions: Strong commitment by sub-project partners, as well as relevant government agencies, Close cooperation among relevant government agencies.
Outcome 2.2: Scientifically and technically sound understanding of progress achieved through project interventions	Movement toward a favourable change in status in the condition of the resource base at the target project sites as evidenced by scientific observation and tracking the relevant indicators. Indicators framework is	Limited use of targeted interventions to prove measurable benefits; critical areas where biodiversity, land and water degradation is occurring are not being addressed.	Monitoring programmes in the project intervention areas will be established by the end of the seventh month of project implementation.	Monitoring programmes operationalized in the project intervention areas.	Risks: Unforeseen extreme weather events. Assumptions: Strong commitment by government agencies, universities and research institutes.

	improved. State and non-state stakeholders demonstrate technical competency in use of indicators to enhance decision making.				
Output 2.2.1: Environmental and socioeconomic indicators for monitoring and assessing water quality in the watershed and the effectiveness of project interventions.	Consensus by government agencies and stakeholders on the indicators selected.	Inadequate strategies and programmes are in place for environmental monitoring in the project's intervention areas.	Agreement on indicators for assessing progress in the implementation of biodiversity conservation and sustainable use and integrated watershed and coastal area management conservation.	Set of well thought out indicators for assessing progress in the implementation of biodiversity conservation and sustainable use and integrated watershed and coastal area management.	Risks: None foreseen. Assumptions: Strong commitment by government agencies, universities and research institutes.
Output 2.2.2: Periodic project reports on water quality and biodiversity in the watershed and the associated coastal zone	Monitoring network established.	Monitoring of biodiversity and water quality in wetlands and associated ecosystems is generally weak or non-existent in the watershed and its estuarine zone; difficult to make baseline assessments; lack or poor level of knowledge required for supporting decision making.	Scientifically and technically reliable information for effectively managing and conserving the biodiversity, land and freshwater resources in the watershed and its estuarine zone.	Annual reports on the monitoring and assessment of project intervention areas.	Risks: Unforeseen extreme weather events. Assumptions: Strong commitment by project partners, particularly universities undertaking sub-project monitoring and assessment activities.
National Component 3: Strengthening of policies and legal and institutional frameworks and capacity building for sustainable land management, integrated management of water resources and the management of ecosystem services, taking into account climate change					
Outcome 3.1: A strengthen policy framework for the integrated watershed and coastal zone management of	The policy, legal and institutional frameworks are effected so that there is improved management of the watershed and its	Current policy, legal and institutional frameworks are insufficient for improving the	Corrective policy, legal and institutional revisions for achieving the integrated	4 analytical sub-project reports with proposals for consideration.	Risks: A traditional sectoral approach to the management of natural resources, particularly freshwater. Assumptions: Commitment of

the Higüamo River watershed by revising and strengthening institutional mechanisms and updating relevant legislation	associated coastal zone, underpinned by enforcement and compliance.	implementation of integrated watershed and coastal area management, including the conservation and sustainable use of biodiversity.	management of the watershed and its associated coastal area.		the Government of the Dominican Republic to improve policy, legal and institutitonal frameworks for integrated watershed management, including the effective conservation and sustainable use of biodiversity.
Output 3.1.1:A strengthened National Intersectoral Committee, comprised of government agencies, NGOs and universities, among others, to ensure broad multisectoral participation in sustainable land management, integrated management of water resources and sustainable management of biodiversity and ecosystems, taking into account institutional constraints and technical capacity and financial constraints.	Interagency and intersectoral coordination and cooperation and strengthened engagement of non-public sector stakeholders in sustainable land management, integrated management of water resources and sustainable management of biodiversity and ecosystems	Current policy, legal and institutional frameworks are insufficient for improving the implementation of integrated watershed and coastal area management, including the conservation and sustainable use of biodiversity.	A proposal for a strengthened National Intersectoral Committee for integrated watershed and coastal area management by the end of the 16th month of sub-project implementation.	An assessment report with recommendations for further consideration by the Dominican Republic Government for a strengthened National Intersectoral Committee.	Risks: Inability by relevant government agencies to agree on a strengthened National Intersectoral Committee; obstacles posed by traditional sectoral approaches; Assumptions: Willingess of government agencies to work together to achieve a more effective integrated management of watersheds and associated coastal areas.
Output 3.1.2: An assessment report with recommendations for strengthening the legal and regulatory framework for formal consideration	Legal and regulatory instruments are effected so that there is improved enforcement and compliance.	Current legislation is insufficient for improving the implementation of integrated watershed and coastal area management.	Corrective revisions for improving the legal basis of integrated watershed and coastal are management are proposed.	An assessment report with recommendations for further consideration by the Dominican Republic Government for improving the legal and regulatory basis for the integrated management of the Higüamo River watershed and associated coastal area.	Risks: A traditional sectoral approach to the legislative and regulatory framework for the management of biodiversity, freshwater and land resources. Assumptions: Commitment of the Dominican Republic Government to improve environmental legislation and regulations for effective management of the watershed, including the conservation and sustainable use of biodiversity.

Output 3.1.3: An assessment report with recommendations for strengthening the policy framework for further consideration	A policy for improving and achieving the integrated management of the Higüamo River watershed and associated coastal area.	Policies are insufficient for achieving the integrated management of the Higüamo River watershed and associated coastal area. Roles and responsibilities of institutions involved in watershed and coastal area management overlap or lack sufficient clarity, leading to fragmented functions of the Government and the Public Administration.	Corrective revisions for improving the policy framework for integrated watershed and coastal area management are proposed.	An assessment report with recommendations for further consideration by the Dominican Republic Government for improving the policy framework, including a master plan, for the integrated management of the Higüamo River watershed and associated coastal area.	Risks: A traditional sectoral approach to policies governing the management of land, freshwater and biodiversity resources. Assumptions: Commitment of the Dominican Republic Government to improve environmental legislation and regulations for effective management of the watershed, including the conservation and sustainable use of biodiversity.
Output 3.1.4: An assessment report with recommendations for further consideration on the feasibility of establishing a new institutional structure for the integrated management of the Higüamo River watershed and its estuarine zone	Decision making is improved through enhanced inter-institutional coordination and cooperation.	Roles and functions of institutions involved in watershed and coastal area management overlap or lack sufficient clarity, leading to fragmented functions of the Government and Public Administration.	An institutional structure for implementing a policy and master plan for the integrated management of the Higüamo River watershed and associated coastal area.	An assessment report with recommendations for further consideration by the Dominican Republic Government for a new institutional structure for the integrated management of the Higüamo River watershed and associated coastal area.	Risks: A traditional sectoral approach to governmental and public administrative functions in Cuba. Assumptions: Commitment of the Cuban Government to improve inter-institutional, cross-sectoral coordination and cooperation for effective conservation and protection of biodiversity.
Outcome 3.2: replication of the sub-project outside project intervention areas	Technologies and approaches are being adapted and replicated. Acceptance, buy-in and engagement of local communities in support of project implementation.	Little awareness of efforts to promote and undertake integrated watershed and coastal area management in the Dominican Republic.	Number of trained government personnel and stakeholders. Establishment of IWEco Dominican Republic website within six months of project inception. Number of publications.	Sub-project reports. IWEco Dominican Republic website for dissemination of information on the project's status, achievements and lessons learned to a wider audience within and outside the country.	Risks: Insufficient resources. Assumptions: Commitment by the Government to replicate elements of the sub-project in other areas of the country outside sub-project intervention areas.

			Presentations at two national conferences. Number of people reached through community outreach, public awareness and education. Presentations at 2 national conferences.	Books, Booklets, Guidelines of good practices, Bulletins, Posters, Agendas. Project report on community outreach and public awareness.	
Output 3.2.1: Trained public officials and stakeholders for project replication	Greater technical capacity in support of project implementation.	No baseline exists; training activities will increase the capacity, efficiency and effectiveness of personnel involved in project replication.	Number of trained project personnel.	Sub-project report on results of training.	Risks: None foreseen. Assumptions: Commitment of Government to disseminate sub-project information to a wide audience of public and private sector stakeholders.
Output 3.2.2: Training workshop reports	Greater technical capacity in support of project implementation.	No baseline exists; training activities will increase the capacity, efficiency and effectiveness of personnel involved in project replication.	Number of trained project personnel.	Sub-project reports on results of training workshops.	Risks: None foreseen. Assumptions: Commitment of Government to disseminate sub-project information to a wide audience of public and private sector stakeholders.
National Component 4: Sharing of project information, lessons learned and good practices, and promoting project replication					
Outcome 4.1: increased awareness of the achievements and benefits of the project	Awareness of the benefits generated by the sub-project reinforce the benefits of applying the integrated watershed and coastal area management	While the integrated management approach to watersheds is gaining support, the availability of concrete information on benefits achieved and lessons learned from	Dissemination of information and lessons learned to a wider audience of stakeholders from both the public and private sectors.	Sub-project reports on the dissemination of information and lessons learned.	Risks: None foreseen. Assumptions: Commitment of Government to disseminate sub-project information to a wide audience of public and private sector stakeholders.

	approach.	projects implemented in the country is limited.			
Output 4.1.1: A program for dissemination of project information, experiences and lessons learned to a wider audience of government officials and stakeholders at the national and international levels, with special emphasis on good agricultural practices, best fishing practices and best environmental practices	Awareness of the benefits generated by the sub-project reinforce the benefits of applying the integrated watershed and coastal area management approach.	While the integrated management approach to watersheds is gaining support, the availability of concrete information on benefits achieved and lessons learned from projects implemented in the country is limited.	Dissemination program finalized by the end of the third year. Dissemination of information and lessons learned to a wider audience of stakeholders from both the public and private sectors during the sub-project's fourth year.	Sub-project reports on the dissemination of information and lessons learned.	Risks: None foreseen. Assumptions: Commitment of Government to disseminate sub-project information to a wide audience of public and private sector stakeholders.
Output 4.1.2: Publications on project findings, achievements and lessons learned	Awareness of the benefits generated by the sub-project reinforce the benefits of applying the integrated watershed and coastal area management approach.	While the integrated management approach to watersheds is gaining support, the availability of concrete information on benefits achieved and lessons learned from projects implemented in the country is limited.	Preparation of publications as major project outputs are produced.	Books, Booklets, Guidelines of good practices, Bulletins, Posters.	Risks: None foreseen. Assumptions: Commitment of Government to disseminate sub-project information to a wide audience of public and private sector stakeholders.
Output 4.1.3: Fully functioning website linked to IW Learn	Dissemination of project information within and outside the Dominican Republic.	Little awareness of efforts to promote and undertake integrated watershed and coastal area management in the Dominican Republic.	Establishment of IWEco website for the Dominican Republic within six months of project inception.	Operationalization of the IWEco Dominican Republic website for dissemination of information on the project's status, achievements and lessons learned to a wider audience within and outside the country.	Risks: None foreseen. Assumptions: Commitment of Government to disseminate sub-project information to a wide audience of public and private sector stakeholders.
Output 4.1.4: Reports of two major technical conferences to demonstrate innovative	Greater awareness at the national importance of the project, its achievements	Little awareness of efforts to promote and undertake integrated	Presentations at 2 national conferences.	Sub-project reports.	Risks: None foreseen. Assumptions: Commitment of Government to disseminate

solutions implemented by the project	and lessons learned.	watershed and coastal area management in the Dominican Republic.			sub-project information to a wide audience of public and private sector stakeholders.
Output 4.1.5: New interventions initiated	Sub-project elements are replicated outside sub-project intervention areas	Relevant baseline from sub-project adapted to new interventions.	A foundation for promoting sub-project replication.	Sub-project reports.	Risks: Insufficient interest due to lack of support and resources. Assumptions: Commitment of Government to replicate the sub-project outside sub-project intervention areas; suitability of the sub-project's approach, methodologies, technologies, achievements and lessons learned as a model for integrated watershed and coastal area management .
Outcome 4.2: Equitable gender participation in project implementation and replication	Proactive participation of women in the sub-project's implementation and replication.	Four of the six key persons involved in the design of the sub-project were women, with the sub-project's contact person also being a woman. In 2011 the illiteracy rate for women and men was 9.5 and 9.9 respectively, and in 2009 for every 100 male university students there were 140 female students. More men, however, have careers in science and technology.	Progress towards equitable gender participation.	Gender audits. Number of women trained for project implementation and replication. Analytical sub-project report.	Risks: None foreseen. Assumptions: Commitment of Government to achieve equitable gender participation in sub-project implementation and replication.
Output 4.2.1: Analytical project report on gender participation	Proactive participation of women in the sub-project's implementation and replication.	Baseline information on the participation of women in project implementation and	Progress towards equitable gender participation.	Gender audits. Number of women trained for project	Risks: None foreseen. Assumptions: Commitment of Government to achieve equitable gender participation

		replication will be maintained.		implementation and replication. Analytical sub-project report.	in sub-project implementation and replication.

Annex 3.3: Budget in UNEP format (Project Timeline 3 years).

Please see attachment.

RECONCILIATION BETWEEN GEF ACTIVITY BASED BUDGET AND UNEP BUDGET BY EXPENDITURE CODE (GEF FINANCE ONLY)

	UNEP BUDGET LINE/OBJECT OF EXPENDITURE	Intervention Code	Budget Item	ALLOCATION BY CALENDAR YEAR (US$) Year 1	Year 2	Year 3	Year 4	Total
10	PROJECT PERSONNEL COMPONENT							
	1100	03	Project Personnel w/m					
			(Show title/grade)					
	1101		Project Coordinator	28,613	28,613	28,613		85,839
	1102		Support staff	27,600	27,600	27,600		82,800
	1199		Sub-Total	56,213	56,213	56,213		168,639
	1200	03	Consultants w/m					
			(Give description of activity/service)					
	1201		Monitoring and Assessment specialists	5,000	4,000	1,000		10,000
	1202		Land Use Planning and GIS specialists	5,000	2,500	2,500		10,000
	1203		Environmental Policy, Law and Legislation specialists	6,000	12,000	12,000		30,000
	1204		Protected Areas Management and Ecotourism specialists	10,000	4,000	7,500		21,500
	1205		Water and Wastewater management specialists	7,083	9,000	12,000		28,083
	1207		Best Fishing Practice specialists	3,000	3,000	3,000		9,000
	1208		Disaster Management specialists	3,000	2,000	-		5,000
	1209		Land-based Sources of Pollution specialists	5,000	5,000	4,000		14,000
	1210		Agricultural best practice specialists	2,000	1,500	1,000		4,500
	1211		Reforestation and ecosystems restoration	7,000	6,500	4,000		17,500
	1299		Sub-Total	53,083	49,500	47,000	-	149,583
	1300	03	Administrative support w/m					
			(Show title/grade)					
	1301							
	1399		Sub-Total	-	-	-	-	-
	1400	03	Volunteers w/m					-
	1499		Sub-Total	-				-
	1600	03	Travel on official business (above staff)					
	1601		Local Travel and Subsistence	5,000	5,000	5,000		15,000
	1602		International Travel					-
	1699		Sub-Total	5,000	5,000	5,000	-	15,000
	1999		Component Total	114,296	110,713	108,213	-	333,222
20	SUB-CONTRACT COMPONENT							-
	2100	03	Sub-contracts (MoU's/LA's for cooperating					-
			agencies)					-
								-
	2199		Sub-Total	-				-
	2200	03	Sub-contracts (MoU's/LA's for non-					-
			profit supporting organizations)					-
	2201		Monitoring and Assessment Programme	45,000	37,000	25,000		107,000
	2202		Reforestation, Restoration and Rehabilitation of ecosystem	65,000	62,316	12,000		139,316
	2203		Wastewater treatment installation	65,000	60,000	35,500		160,500
	2204		RWH system installation	15,000	15,000	10,000		40,000
	2205		Minimization of Land-based Sources of Pollution	40,000	23,000	25,000		88,000
	2206		Reforestation and forest livelihood programme	42,672	35,000	41,800		119,472
								-
								-
	2299		Sub-Total	272,672	232,316	149,300	-	654,288
	2300	03	Sub-contracts (commercial purposes)					-
	2301		Development of website	8,000	2,578			10,578
	2399		Sub-Total	8,000	2,461	-	-	10,461
	2999		Component Total	280,672	234,777	149,300	-	664,749
30	TRAINING COMPONENT							-
	3100	03	Fellowships (total stipend/fees, travel					-
			costs, etc)					-
								-
	3199		Sub-Total	-				-

	3200	**03**	**Group training (study tours, field trips, workshops, seminars, etc) (give title)**					-
	3201		Workshop with stakeholders on Higuamo River Master Plan	14,000	16,000	23,000		53,000
	3202		IWCAM Mgmt - Environmental Monitoring methods and Techniques,Env.Planning	1,500	2,500	1,000		5,000
	3203		Workshop with local Fishing Communities on BEP	2,000	3,000	1,000		6,000
	3204		Workshop on Public & Private Sector cooperation	8,000	13,000	6,000		27,000
								-
	3205							-
	3205							-
	3299		Sub-Total	25,500	34,500	31,000	-	91,000
	3300	**03**	**Meetings/conferences (give title)**					-
	3301		Project Steering Committee	1,000	1,000	1,000		3,000
	3302		Stakeholder Advisory Committee	1,500	2,500	1,000		5,000
	3303		Consultative meetings watershed master plan	3,000	5,000	3,000		11,000
	3304		Consultative meetings - establish protected areas	3,000	5,000	2,000		10,000
	3305		Consultative meetings - emergency plan development	2,500	3,000	2,500		8,000
	3306		Partnership Meetings/Regional training Workshops	2,000	2,000	2,000		6,000
	3305							-
	3399		Sub-total	13,000	18,500	11,500	-	43,000
	3999		**Component Total**	38,500	53,000	42,500	-	134,000
40	**EQUIPMENT & PREMISES COMPONENT**							-
	4100	**03**	**Expendable equipment (items under**					-
			($1,500 each, for example)					-
	4101		Office supplies	500	500	500		1,500
								-
	4199		Sub-Total	500	500	500	-	1,500
	4200	**03**	**Non-expendable equipment**					-
	4201		Computer, printer, projector, camera	6,490				6,490
	4202		Laboratory equipment and field instrumentation	108,000				108,000
	4203							-
			1 vehicle (hilux double cabin) + 2 motorcycles	82,000				82,000
				-				-
	4299		Sun-Total	196,490	-	-	-	196,490

	4300	**03**	**Premises (office rent, maintenance**					-
			of premises, etc)					-
								-
	4305							-
	4305							-
	4399		Sub-Total	-				-
	4999		**Component Total**	196,990	500	500	-	197,990
50	**MISCELLANEOUS COMPONENT**							-
	5100	**03**	**Operation and maintenance of equip.**					-
			(example shown below)					-
	5101		Operational costs vehicle and motorcycles	6,000	11,000	6,000		23,000
								-
	5199		Sub-Total	6,000	11,000	6,000	-	23,000
	5200	**03**	**Reporting costs (publications, maps,**					-
			newsletters, printing, etc)					-
	5201		Printing and Publication: Project Management Reports, Environmental Education	6,500	5,000	7,000		18,500
	5202		Reports on Project Findings (Incl. Translation costs)	9,500	20,185	10,500		40,185
	5203		Good Practices - Agriculture, Fishing, Natural Resource Management	4,000	5,000	4,000		13,000
	5204		Project Tool kits for decision makers(10,000)	500	1,500	1,000		3,000
	5205		Project tool kits for stakeholders (30,000)	1,000	1,500	500		3,000
	5299		Sub-Total	21,500	33,185	23,000	-	77,685
	5300	**03**	**Sundry (communications, postage,**					-
			freight, clearance charges, etc)					-
	5301		Communication					-
								-
	5399		Sub-Total	-	-	-	-	-
	5400	**03**	**Hospitality and entertainment**					-
								-
	5499		Sub-Total	-				-
	5500	**03**	**Evaluation (consultants fees/travel/**					-
			DSA, admin support, etc. internal projects)					-
	5501		Mid Term Evaluation					-
	5502		Terminal Evaluation					-
								-
	5599		Sub-Total	-	-	-	-	-
	5999		**Component Total**	27,500	44,185	29,000	-	100,685

	4300	**03**	**Premises (office rent, maintenance**					-
			of premises, etc)					-
								-
	4305							-
	4305							-
	4399		Sub-Total	-				-
	4999		**Component Total**	196,990	500	500	-	197,990
50	**MISCELLANEOUS COMPONENT**							-
	5100	**03**	**Operation and maintenance of equip.**					-
			(example shown below)					-
	5101		Operational costs vehicle and motorcycles	6,000	11,000	6,000		23,000
								-
	5199		Sub-Total	6,000	11,000	6,000	-	23,000
	5200	**03**	**Reporting costs (publications, maps,**					-
			newsletters, printing, etc)					-
	5201		Printing and Publication: Project Management Reports, Environmental Education	6,500	5,000	7,000		18,500
	5202		Reports on Project Findings (Incl. Translation costs)	9,500	20,185	10,500		40,185
	5203		Good Practices - Agriculture, Fishing, Natural Resource Management	4,000	5,000	4,000		13,000
	5204		Project Tool kits for decision makers(10,000)	500	1,500	1,000		3,000
	5205		Project tool kits for stakeholders (30,000)	1,000	1,500	500		3,000
	5299		Sub-Total	21,500	33,185	23,000	-	77,685
	5300	**03**	**Sundry (communications, postage,**					-
			freight, clearance charges, etc)					-
	5301		Communication					-
								-
	5399		Sub-Total	-	-	-	-	-
	5400	**03**	**Hospitality and entertainment**					-
								-
	5499		Sub-Total	-				-
	5500	**03**	**Evaluation (consultants fees/travel/**					-
			DSA, admin support, etc. internal projects)					-
	5501		Mid Term Evaluation					-
	5502		Terminal Evaluation					-
								-
	5599		Sub-Total	-	-	-	-	-
	5999		**Component Total**	27,500	44,185	29,000	-	100,685

			TOTAL COSTS	**657,958**	**443,175**	**329,513**	-	**1,430,646**
							check:	1,430,646

Annex 3.4: Project Timeline (3 years)

COMPONENT 1. National Sub-project 1.3: Dominican Republic	Year 1				Year 2				Year 3				Responsibility
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Component 1: Developing and implementing approaches for the integrated management and maintenance of ecosystem services of the Higüamo River watershed													
Sub-component 1.1: Developing an integrated management plan for the Higüamo River watershed and estuarine zone													
Activity 1.1.1.1 Prepare a master plan for the integrated management Higüamo River watershed and estuarine zone, taking into account innovative adaptations to climate change and sensitive ecosystems.													
Activity 1.1.1.2 Develop necessary professional skills at the national and/or local levels to support project implementation.													
Sub-component 1.2: Supportive plans and guidelines													
Activity 1.2.1.1 Develop guidelines for coastal bioengineering and reforestation.													
Activity 1.2.1.2 Develop guidelines for watershed reforestation.													
Activity 1.2.1.3 Develop and apply guidelines for small wastewater treatment systems.													
Activity 1.2.1.4 Develop water safety plans for small public water supply systems.													
Activity 1.2.1.5 Develop a plan for reducing water pollution from land-based activities in the watershed.													
Activity 1.2.1.6 Develop and apply a good agricultural practices (GAP) protocol for the management and control of organic waste.													
Activity 1.2.1.7 Develop guidelines for bioengineering for slope stabilization, runoff control and aquifer replenishment.													
Sub-component 1.3: Environmental restoration and sustainable use measures for improved wastewater management, increased access to safe water and enhanced ecosystem services													
Activity 1.3.1.1 Create a habitat conservation program for ecosystems and threatened species in the watershed and its estuarine zone.													
Activity 1.3.1.2 Promote ecotourism in the watershed and its estuarine zone.													
Activity 1.3.1.3 Reforest critical areas within the watershed, with particular attention given to mangroves.													
Activity 1.3.1.4 Promote good fishing practices in the watershed and estuarine zone.													

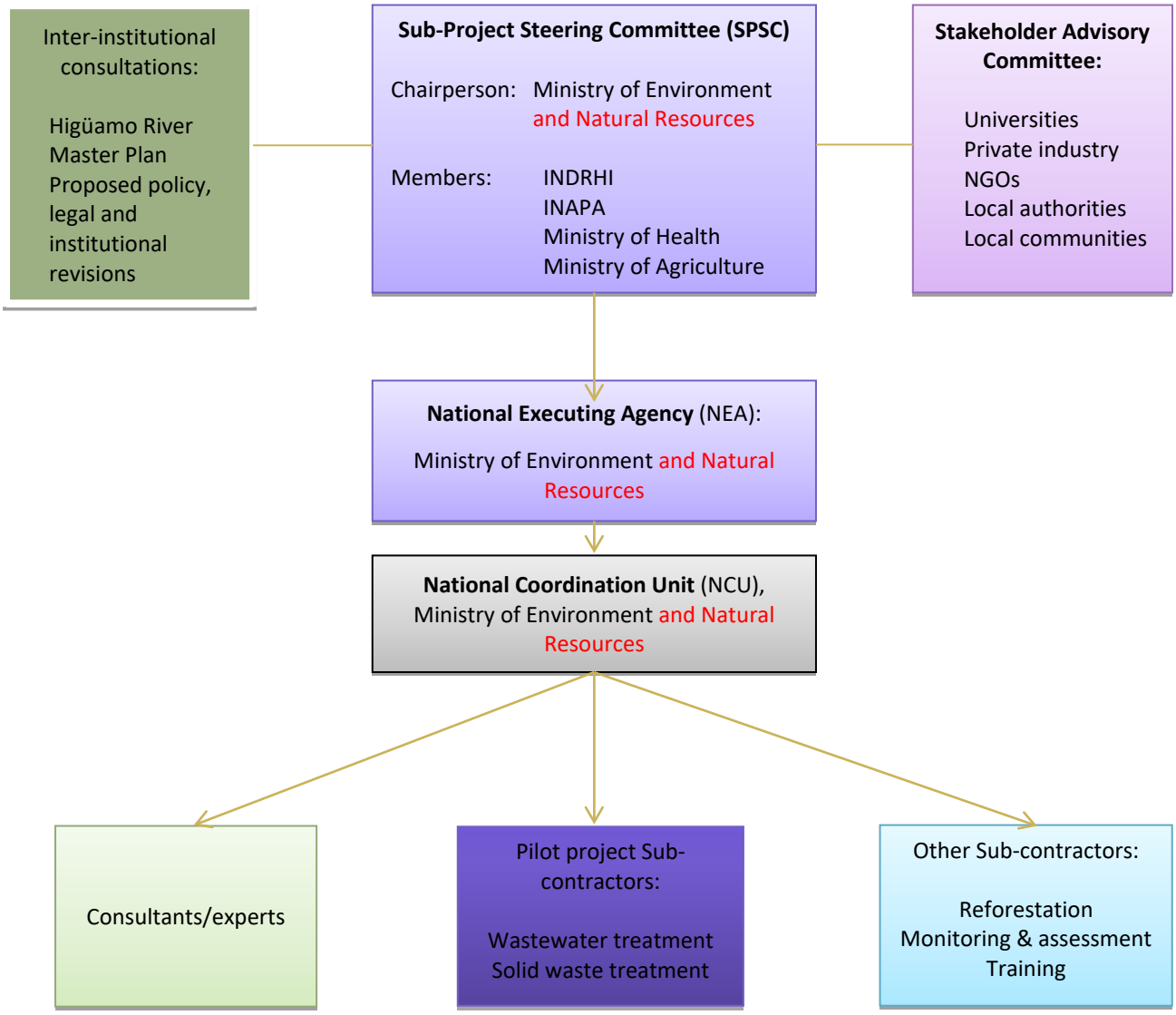
COMPONENT 1. National Sub-project 1.3: Dominican Republic	Year 1				Year 2				Year 3				Responsibility
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Activity 1.3.1.5 Strengthen the implementation of the National Emergency Plan, taking into account climate change related disasters, including hurricanes, floods and landslides, as well as land degradation.													
Activity 1.3.1.6 Install and assess the effectiveness of rainwater harvesting systems.													
Activity 1.3.1.7 Implement a pilot project on solid waste management in a selected community within the watershed.													
Activity 1.3.1.8 Implement a pilot project on wastewater treatment in a selected community/ area within the watershed.													
Component 2: Assessing problems and identifying priorities for improving the management of the land, water and biodiversity resources of the Higüamo River watershed and its associated coastal zone, taking into account climate change, sensitive ecosystems and ecosystem services													
Sub-component 2.1: Identifying priority problems and sources of pollution													
Activity 2.1.1.1 Identify and assess the problems and sources of pollution impacting the Higüamo River.													
Activity 2.1.1.2 Identify human health risks for selected communities resulting from polluted freshwater and coastal waters.													
Activity 2.1.1.3 Identify priorities to manage and guide investments in efficient natural resource and ecosystem management.													
Sub-component 2.2: Monitoring and assessment of project interventions and capacity building to support project implementation													
Activity 2.2.1.1 Select the environmental and socioeconomic indicators to be used for monitoring and assessing water quality in the watershed and the effectiveness of project interventions, taking into account the requirements of the Aruba Protocol on LBS.													
Activity 2.2.1.2 Establish a monitoring program based on the selected indicators for periodically assessing the quality of freshwater and coastal seawater.													
Component 3: Strengthening of policies and legal and institutional frameworks and capacity building for sustainable land management, integrated management of water resources and the management of ecosystem services, taking into account climate change													
Sub-component 3.1: Policies and legal and institutional frameworks													
Activity 3.1.1.1 Improve coordination between the sectors involved in the management of water resources, including coastal zone waters.													

COMPONENT 1. National Sub-project 1.3: Dominican Republic	Year 1				Year 2				Year 3				Responsibility
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Activity 3.1.1.2 Assess existing legislation relevant to the integrated management of the Higüamo River watershed and its estuarine zone.													
Activity 3.1.1.3 Assess existing policies relevant to the integrated management of the Higüamo River watershed and its estuarine zone.													
Activity 3.1.1.4 Assess the feasibility of restructuring and integrating institutions most closely linked to the integrated management of Higüamo River watershed and its estuarine zone.													
Sub-component 3.2: Capacity-building													
Activity 3.2.1.1 Raise awareness among public officials and stakeholders in municipal governments, local government agencies and organizations of the elements and actions required for IWCAM.													
Activity 3.2.1.2 Organization of a training program directed at public officials and stakeholders, including private industry, on IWCAM and to disseminate project information and lessons learned within the Higüamo River watershed and estuarine zone.													
Component 4: Sharing of project information, lessons learned and good practices, and promoting project replication													
Subcomponent 4.1: Dissemination of information, good practices and lessons learned and project replication													
Activity 4.1.1.1 Produce project publications for disseminating scientific and technical information, assessments and analyses, lessons learned and best practices, among others (C1.7).													
Activity 4.1.1.2 Organize two major technical conferences to demonstrate innovative solutions implemented by the project (C1.7).													
Activity 4.1.1.3 Disseminate project information, experiences and lessons learned to a wider audience of government officials and stakeholders at the national level.													
Activity 4.1.1.4 Exchange information on experiences and lessons learned with other SIDs.													
Activity 4.1.1.5 Engage stakeholders at the national level in applying good agricultural practices, best fishing practices and best environmental practices in the field.													
Activity 4.1.1.6 Develop and maintain a website for providing up-to-date information on progress in project implementation, including achievements and lessons learned, and replication.													
Activity 4.1.1.7 Promote equitable gender participation in project implementation and replication.													

Annex 3.5: Execution arrangement support documents

3.5.1: Subproject Structure:

Decision-making Flowchart and Organizational Chart



3.5.2. Letters of Co-financing

MINISTERIO DE MEDIO AMBIENTE Y RECURSOS NATURALES

"Año del Bicentenario del Natalicio de Juan Pablo Duarte"

20 DIC 2013

VCI-137/13

4412

Dr. Maryam Naimir-Fuller
Director
Division of Global Environment Facility Coordination (DGEF)
United Nations Environment Programme
PO Box 30552, Nairobi,
Kenya
E-mail: maryam.niamir-fuller@unep.org

Dear Ms Naimir-Fuller,

Subject: Letter of Commitment for Partnership and Co-financing to the GEF-funded Full Size Project "Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States (IWEco Project)"

The Government of the Dominican Republic through the Ministry of Environment and Natural Resources notes and commends the development of the GEF-funded Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States (IWEco) Project. The Ministry of Environment and Natural Resources welcomes the opportunity to partner with the United Nations Environmental Programme (UNEP) in the implementation of this project given its role in assisting our country with efforts to protect our biological diversity, ensure the upgrade of water quality and secure its development through the commitment of the direct affected population.

We note that several of the IWEco Project outcomes and outputs are of direct relevance to the scope of activities that are carried out by the Ministry of Environment and Natural Resources and we are in a position to lend support to this important regional initiative.

This letter therefore serves to confirm the commitment of the Ministry of Environment and Natural Resources in contributing to the implementation of the GEF-IWEco Project particularly in the "Integrated Management of the Biodiversity, Water and Land Resources of the Higüamo River Watershed and Associated Coastal Zone, including Mitigating Climate Change Impacts" and all its components at the national level.

The contribution of the Ministry of Environment and Natural Resources to the implementation and development of the IWEco Project is estimated at **2.5 million USD** in kind over the duration of the project.

Ave. Cayetano Germosén, Esq. Ave. Gregorio Luperón, El Pedregal, Santo Domingo, República Dominicana. Código postal: 02487 •Tels.: 809-567-4300 / 809-807-1116 • www.ambiente.gob.do.

MINISTERIO DE MEDIO AMBIENTE Y RECURSOS NATURALES

"Año del Bicentenario del Natalicio de Juan Pablo Duarte"

-2-

We are pleased to be engaged as a partner and look forward to fruitful collaboration in the implementation of the Integrated Water, Land and Ecosystems Project.

Yours Sincerely,

PATRICIA ABREU FERNÁNDEZ
Deputy Minister for International Cooperation
Ministry of Environment and Natural Resources
Dominican Republic

cc Nelson Andrade Colmenares
Coordinator, UNEP-CAR/RCU
Email: nac@cep.unep.org

Ave. Cayetano Germosén, Esq. Ave. Gregorio Luperón, El Pedregal, Santo Domingo, República Dominicana. Código postal: 02487 •Tels.: 809-567-4300 / 809-807-1116 • www.ambiente.gob.do.

Annex 3.6Terms of Reference for Partners and Consultants

3.6.1 Consultant: Technical Coordinator

3.6.1.1 Background

The National Coordinator will be assisted by a full-time Technical Coordinator in the supervision and management of the sub-project. This person should have a graduate degree in a related field of environmental science and management, with ample experience in environmental management of biodiversity, freshwater and land resources.

3.6.1.2 Description of Work

The Technical Coordinator will be responsible for the overall technical supervision and coordination of the sub-project component for the Dominican Republic; serve as secretary of the National Project Steering Committee (NPSC), as well as the National Stakeholder Advisory Committee (NSAC); implement the decisions of the NPSC; and support the National Coordinator in providing UNEP/CAR RCU and MIMARENA with periodic narrative and administrative reports on the status of implementation of the sub-project.

3.6.1.3 Outputs

Project outputs will include:

- Periodic narrative reports on the status of implementation of the sub-project.
- Periodic administrative reports on the status of implementation of the sub-project.
- Reports of the meetings of the NPSC.
- Reports of the meetings of the NSAC.

3.6.1.4 Timeline (indicative)

The Technical Coordinator will be contracted for the length of the project (36 months)

3.6.1.5 Provisional budget:

3.6.2 Consultant: Administrative Assistant

3.6.2.1 Background

The Technical Coordinator will be assisted by an Administrative Assistantin the management of the sub-project, particularly as regards the utilization of funds and the recording of expenditures. This person should have a degree in a related field of project administration, with experience in project administration.

3.6.2.2 Description of Work

The Administrator will assistthe Technical Coordinator in preparing periodic sub-project administrative reports and in the organization of coordination and advisory meetings.

3.6.2.3 Outputs

Project outputs will include:

- Periodic administrative reports on the status of implementation of the sub-project.
- Tables recording achievement of sub-project outputs and targets and linkages to indicators.
- Systematic indexing and filing of all project outputs.

- A report of the organization of coordination and advisory meetings.
- Records of expenditures against sub-project budget lines.

3.6.2.4 Timeline (indicative)

Administrative Assistantwill be contracted for the length of the project (36 months)

3.6.2.5 Provisional budget:

3.6.3 Consultant: Baseline and indicators

3.6.3.1 Background

At the initiation of sub-project implementation, a consultant will be required to complete the baseline based upon available information and to assist in the selection of indicators to be used in monitoring and assessing progress in implementation in project intervention areas.Relevant information from this consultancy will also be inputted into the master plan for the watershed and its associated coastal zone.

3.6.3.2 Description of Work

Specifically, this consultant, in consultation with relevant national and local authorities as well as stakeholders, will provide technical support to the following activities:

- C2.1.1 Identify and assess the problems and sources of pollution impacting the Higüamo River.
- C2.1.2 Identify human health risks for selected communities resulting from polluted freshwater and coastal waters.
- C2.1.3 Identify priorities to manage and guide investments in efficient natural resource and ecosystem management.
- C2.2.1 Select the environmental and socioeconomic indicators to be used for monitoring and assessing water quality in the watershed and the effectiveness of project interventions, taking into account the requirements of the Aruba Protocol on LBS.
- C2.2.2 Establish a monitoring program based on the selected indicators for periodically assessing the quality of freshwater and coastal seawater.

3.6.3.3 Outputs

Project outputs will include:

- An assessment of relevant information and lessons learned from other projects that can feed into the sub-project's implementation.
- A completed baseline for structuring the project's monitoring and assessment programme.
- A project report on human health risks for selected communities.
- Environmental and socioeconomic indicators for monitoring and assessing water quality in the watershed and the effectiveness of project interventions.

3.6.3.4 Timeline (indicative)

The consultant will be contracted for a period of 17 weeks from the commencement of the second month of the project through to the end of the fifth month.

3.6.3.5 Provisional budget:

3.6.4 Consultant: Expert in land use planning and geographic information systems

3.6.4.1 Background

The development of a master plan for the integrated management of the Higüamo River watershed and associated coastal zone is at the heart of this sub-project. All other activities will contribute to or develop from the preparation of the master plan.

3.6.4.2 Description of Work

This consultant, in consultation with relevant national and local authorities as well as stakeholders, will provide technical support to the implementation of activities:

- C1.1.1 Prepare a master plan for the integrated management of the Higüamo River watershed and estuarine zone, taking into account innovative adaptations to climate change and sensitive ecosystems.
- C1.2.2 Develop guidelines for watershed reforestation.

3.6.4.3 Outputs

Project outputs will include:

- A mapping of land uses for the watershed and its estuarine zone, including the location of biodiversity and pollution hotspots, as well as areas most vulnerable to the impacts of climate change.
- A master plan for the integrated management of the Higüamo River watershed and associated coastal zone

3.6.4.4 Timeline (indicative)

The consultant will be contracted for a period of 104 weeks from the commencement of the second month of the project through to the end of the twenty-fourth month.

3.6.4.5 Provisional budget:

3.6.5 Consultant: Specialist in environmental policy, law and institutions

3.6.5.1 Background

The implementation of the master plan for the integrated management of the Higüamo River watershed and associated coastal zone will require policy, legal and institutional reforms. An executive decree or legislative bill for the integrated management of the Higüamo River watershed and associated coastal zone would be the first for the country based on environmentally sound land use planning.Relevant information from this consultancy will also be inputted into the master plan for the watershed and its associated coastal zone.

3.6.5.2 Description of Work

This consultant, in consultation with relevant national and local authorities as well as stakeholders, will provide technical support to the implementation of activities:

- C3.1.1 Improve coordination between the sectors involved in the management of water resources, including coastal zone waters.
- C3.1.2 Assess existing legislation relevant to the integrated management of the Higüamo River watershed and its estuarine zone.

- C3.1.3 Assess existing policies relevant to the integrated management of the Higüamo River watershed and its estuarine zone.
- C3.1.4 Assess the feasibility of restructuring and integrating institutions most closely linked to the integrated management of Higüamo River watershed and its estuarine zone.

3.6.5.3 Outputs

Project outputs will include:

- Identification of gaps and opportunities to update the policy framework on water quality, industrial discharge, land use and ecosystem management.
- Identification of gaps and opportunities to update the legal and regulatory framework on water quality, industrial discharge, land use and ecosystem management.
- Assessment report with recommendations for further consideration by the Dominican Republic Government for revising and strengthening the policy, legal and institutional frameworks for achieving more efficiently and effectively the integrated management of the Higüamo River watershed and its estuarine zone.

3.6.5.4 Timeline (indicative)

The consultant will be contractedfor a period of 39 weeks from the commencement of the eighth month of the project through to the end of the sixteenth month.

3.6.5.5 Provisional budget:

3.6.6 Consultant: <u>Specialist in protected areas and ecotourism</u>

3.6.6.1 Background

Biodiversity conservation and sustainable use is the primary focus of the implementation of the master plan for the integrated management of the Higüamo River watershed and associated coastal zone. The sustainable management of the watershed's biodiversity, as well as the health of its ecosystems, will contribute to improving the livelihoods of the inhabitants of the region. In addition, the conservation of forests by eliminating deforestation will also be a key element in mitigating the negative impacts of climate change.Relevant information from this consultancy will also be inputted into the master plan for the watershed and its associated coastal zone.

3.6.6.2 Description of Work

This consultant, in consultation with relevant national and local authorities as well as stakeholders, will provide technical support to the implementation of activities:

- C1.3.1 Create a habitat conservation program for ecosystems and threatened species in the watershed and its estuarine zone.
- C1.3.2 Promote ecotourism in the watershed and its estuarine zone.

3.6.6.3 Outputs

Project outputs will include:

- An expanded watershed protected areas system through the establishment of new protected areas that will be integrated into the master plan for the integrated management of the Higüamo River watershed and its estuarine zone.
- Establishment of an ecotourism route in the Higüamo River watershed and its estuarine zone making use of existing Wildlife Refuges and new protected areas.

- Agreements with the tourism industry, including hotels and tour agencies, for the promotion of ecotourism throughout the watershed and its associated coastal zone.
- A project report on status of overall implementation and achievements.

3.6.6.4 Timeline (indicative)

The consultant will be contracted for a period of 26 weeks from the commencement of the eleventh month of the project through to the end of the sixteenth month.

3.6.6.5 Provisional budget:

3.6.7 Consultant: <u>Specialist in ecosystem restoration and reforestation</u>

3.6.7.1 Background

Biodiversity conservation and sustainable use is the primary focus of the implementation of the master plan for the integrated management of the Higüamo River watershed and associated coastal zone. The sustainable management of the watershed's biodiversity, as well as the health of its ecosystems, will contribute to improving the livelihoods of the inhabitants of the region. To this end, ecosystem restoration and reforestation will be fundamental. Reforestation activities will also be a key element in mitigating the negative impacts of climate change.Relevant information from this consultancy will also be inputted into the master plan for the watershed and its associated coastal zone.

3.6.7.2 Description of Work

This consultant, in consultation with relevant national and local authorities as well as stakeholders, will provide technical support to the implementation of activities:

- C1.2.1 Develop guidelines for coastal bioengineering and reforestation.
- C1.2.2 Develop guidelines for watershed reforestation.
- C1.3.3 Reforest critical areas within the watershed, with particular attention given to mangroves.

3.6.7.3 Outputs

Project outputs will include:

- Guidelines for coastal bioengineering and reforestation.
- Guidelines for watershed restoration.
- Identification of critical watershed areas to be reforested.
- Project report on status of implementation and achievements.

3.6.7.4 Timeline (indicative)

The consultant will be contracted for a period of 13 weeks from the commencement of the fourth month of the project through to the end of the sixth month.

3.6.7.5 Provisional budget:

3.6.8 Consultant: <u>Specialist in best fishing practices</u>

3.6.8.1 Background

The freshwater and marine biodiversity of the Higüamo River watershed and associated coastal zone is under a great deal of pressure from both the pollution of waters and excessive exploitation. In response to the pressures on biodiversity from exploitation, the project aims to promote best fishing

practices among the many fishermen that depend on its watershed and associated coastal zone. While fishing activities are limited in the estuary and lower course of the river due to pollution, fishing is an important activity beyond the estuary in associated coastal and marine areas, with some fishermen fishing as far away as 50 kilometers from the coast.

3.6.8.2 Description of Work

This consultant, in consultation with relevant national and local authorities as well as stakeholders, will provide technical support to the implementation of activity C1.3.4 on promoting good fishing practices in the watershed and estuarine zone.Relevant information from this consultancy will also be inputted into the master plan for the watershed and its associated coastal zone.

3.6.8.3 Outputs

Project outputs will include:

- Identification of areas most vulnerable to unsustainable fishing in the watershed and its associated coastal zone.
- Guidelines of good fishing practices appropriate for the watershed and its estuarine zone.
- Project report on the results of the application of good fishing practices in project intervention areas.

3.6.8.4 Timeline (indicative)

The consultant will be contracted for a period of 4 weeks during the seventh month of the project.

3.6.8.5 Provisional budget:

3.6.9 Consultant: <u>Sanitary Engineer specialized in waste water and solid waste treatment</u>

3.6.9.1 Background

Wastewater pollution and pollution from unsustainable solid waste disposal are two of the most serious causes of the degradation of natural resources, particularly biodiversity, freshwater and coastal and marine waters. In response to the pressures on biodiversity from exploitation, the project aims to promote environmentally sound wastewater and solid waste treatment in selected critical areas of the watershed. Hot spot sources of pollution from wastewater and solid wastes will be identified and incorporated into the master plan for the watershed and its associated coastal zone.

3.6.9.2 Description of Work

This consultant, in consultation with relevant national and local authorities as well as stakeholders, will provide technical support to the implementation of activities:

- C1.2.3 Develop and apply guidelines for small wastewater treatment systems.
- C1.2.4 Develop water safety plans for small public water supply systems.
- C1.3.7 Implement a pilot project on solid waste management in a selected community within the watershed.
- C1.3.8 Implement a pilot project on wastewater treatment in a selected community/ area within the watershed.

3.6.9.3 Outputs

Project outputs will include:

- Water safety plans
- Identification of "hot spot" point sources of pollution from untreated wastewater and solid wastes.
- Selection of pilot project sites for wastewater and solid waste treatment.
- Guidelines for small wastewater treatment systems to be employed in the pilot project.
- Guidelines for small solid waste treatment systems to be employed in the pilot project.

3.6.9.4 Timeline (indicative)

The consultant will be contracted for a period of 26 weeks from the beginning of the seventh month of the project to the end of the twelfth month.

3.6.9.5 Provisional budget:

3.6.10 Consultant: Specialist in disaster management, including disasters caused by climate change

3.6.10.1 Background

The conservation and sustainable use of biodiversity, freshwater and land in the Dominican Republic is at risk from the negative impacts of climate change. A regional emergency plan for responding to natural disasters will be incorporated into the master plan of the watershed and its associated coastal zone, thus strengthening the country's National Emergency Plan.

3.6.10.2 Description of Work

This consultant, in consultation with relevant national and local authorities as well as stakeholders, will provide technical support to the implementation of activity C1.3.5on strengthening the implementation of the National Emergency Plan, taking into account climate change related disasters, including hurricanes, floods and landslides, as well as land degradation (C1.5).

3.6.10.3 Outputs

Project outputs will include:

- A project report on measures taken in support of the implementation of the National Emergency Plan.
- An emergency plan for the Higüamo River watershed and associated coastal zone, taking into account the impacts of climate change.

3.6.10.4 Timeline (indicative)

The consultant will be contracted for a period of 4 weeks commencing and ending with the twenty-fifth month.

3.6.10.5 Provisional budget:

3.6.11 Consultant: Expert on land-based sources(LBS) of pollution

3.6.11.1 Background

The Dominican Republic is a Party to the Cartagena Convention, which as a priority is addressing the environmental impact of land-based sources of pollution on the coastal and marine environment. The integrated management of watersheds and coastal areas is one of the most effective approaches to addressing land-based sources of pollution. Information on point and non-point sources of

pollution will be incorporated into the master plan for the integrated management of the watershed and its associated coastal zone.

3.6.11.2 Description of Work

This consultant, in consultation with relevant national and local authorities as well as stakeholders, will provide technical support to the implementation of activities:

- C1.2.5 Develop a plan for reducing water pollution from land-based activities in the watershed (C1.6).
- 1.2.6 Develop and apply a protocol for the management and control of organic waste (C1.6).

3.6.11.3 Outputs

Project outputs will include:

- A plan for reducing land-based sources of water pollution.
- A protocol for the management and control of organic waste from cattle broken down by worms.

3.6.11.4 Timeline (indicative)

The consultant will be contracted for a period of 8 weeks from the beginning of the sixth month of the project to the end of the seventh month.

3.6.11.5 Provisional budget:

GEF increment	Partner Co-financing

3.6.1.6 Contacts

Annex 3.7: Biodiversity of the Dominican Republic

Estado de la biodiversidad en la República Dominicana

La República Dominicana, con sus 48,670.82 km², forma parte del sitio sobresaliente de la Biodiversidad del Caribe, el cual se encuentra entre los cinco más importantes del planeta (Myers et al, 2000; Smith et al,2005, cit. MIMARENA, 2011). En particular, forma parte de La Hispaniola, caracterizada por una gran riqueza biológica, con altos niveles de endemismo. Ésta característica se ha visto favorecida, a su vez, por la diversidad de escenarios geográficos, amplia gama de relieves que van desde áreas bajo el nivel del mar (Lago Enriquillo) hasta la altura más importante del Caribe (el Pico Duarte), así como a las variables condiciones climáticas asociadas a esas condiciones, lo que resulta un rasgo muy especial en el país. (ver **Anexo No. 1**)

Para el país se han reportado 6,381 especies de macrohongos, número que se considera muy bajo, si se compara con los reportados para Cuba (44,852) y Puerto Rico (16,082) (Baroni y Castrell, 2007 cit. MIMARENA, 2011).. Se conocen 505 musgos y 407 líquenes (Ministerio Ambiente2010, cit. MIMARENA, 2011). Asimismo, Betancourt y Herrera (2001, 2007, cit. MIMARENA, 2011) han registrado 72 microalgas marinas, 262 macroalgas y 7 fanerógamas, asi como 1,696 invertebrados marinos para La Hispaniola. Se conocen alrededor de 6,000 especies de plantas vasculares, incluidas en 1,283 géneros y 181 familias. De éstas, 2,000 especies (34%) y 31 géneros son endémicos (Mejía y García, 2007; Ministerio Ambiente, 2010 cit. MIMARENA, 2011).

A su vez, Pérez-Gelabert (2008 cit. MIMARENA, 2011) reporta 8,237 especies de artrópodos para La Hispaniola. De éstas, 6,833 vivientes. De todas las especies reportadas, 2,521 (36.9 por ciento) son endémicas. El mayor de todos los grupos conocidos es el de los insectos, con 5,676 especies vivientes. No hay lista desagregada por países (Haití y República Dominicana). La fauna de vertebrados se caracteriza por una preponderancia de reptiles y anfibios, con muy pocos mamíferos nativos (MIMARENA, 2011) (ver **Anexo No. 1**).

Los planes y programas actuales del Ministerio de Medio Ambiente y Recursos forman parte de la planificación nacional (2008-2010), se encuentran incluidos en 4 programas sustantivos. En particular, el Programa 11 es el relativo a la conservación de las áreas protegidas y la biodiversidad; el Programa 12 que incluye el Subprograma 01 referente a los recursos forestales y el Subprograma 03 relativo a los recursos costeros y marinos. El Programa 14 es el relativo a la protección y defensa del medio ambiente. El Programa 99 incluye los presupuestos del Jardín Botánico Nacional, el Parque Zoológico Nacional, el Museo Nacional de Historia Natural y el Acuario Nacional. Otros programas incluyen acciones importantes pero más indirectas para la gestión y conservación de la biodiversidad nacional.

El Programa 11 relativo a la conservación de las áreas protegidas y la biodiversidad tiene un presupuesto de RD$159.1 millones (US$4.2 millones). El Programa 12, Subprograma 01, manejo de recursos forestales tiene un presupuesto de RD$325.1 millones y el Subprograma 03 recursos costeros marinos tiene RD$37.2 millones (US$1 millón). El presupuesto del Jardín Botánico es de RD$48.2 millones (US$1.3 millones), el del ZOODOM es de RD$39.8 (US$1.1 millones); el Museo Nacional de Historia Natural es de RD$23.5 millones (US$0.6 millones); y el Acuario Nacional de RD$34.0 millones (US$0.9 millones). (MIMARENA, 2011). La segregación más precisa de los montos exactos del presupuesto nacional y cooperación internacional dedicados a la biodiversidad se dificulta debido a que, prácticamente, en todos los programas del Ministerio se hacen inversiones a favor de la biodiversidad, aún no estén formalmente considerados como tales.

En general, del presupuesto anual de la nación cerca de un 1% es dedicado a la protección del ambiente, lo que corresponde entre un 0.08 a 0.11% del PIB, y es bajo comparado con otros países de la región. La inversión anual total en las áreas protegidas de la República Dominicana es de US$10.4 millones, situando al país en el octavo lugar de la región y la inversión anual por hectárea por año es de US$8.43, ocupando el quinto lugar de la región) (MIMARENA, 2011).

Annex 3.8: General Information about the Higüamo River watershed and Estuarine Zone

Elementos generales sobre la Cuenca del Rio Higuamo

Distribución geográfica

La Cuenca del Rio Higuamo abarca fundamentalmente las provincias de Hato Mayor y San Pedro de Macorís, en la región este de la República Dominicana. Pertenece al distrito hidrogeológico “Zona de San Pedro de Macorís y La Romana” (ver **Fig. 18 y 24**)

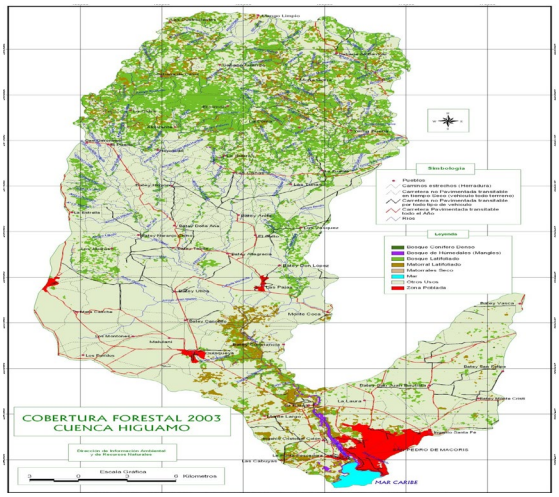


Fig. 24 Área de la Cuenca del Rio Higuamo

En el caso del Rio Higuamo, se plantea que su caudal es de unos 12.9 m^3 /seg y su cuenca alcanza los 1 182 km^3. (http:// www.listin. com.do/zona-este/2007/11 /22 /37713/Rio-Higuamo-un-estuario-amenazado), estando conectada con los ríos Maguá, Casuí, Gumira y arroyo Líbano.

La cuenca del río Higuamo es prácticamente plana. El 67% de los suelos tiene pendientes de 0 a 4%; el 20% entre 8% y 16%; el 9% entre 16% y 32% y el 4% mayor de 32%. El relieve es poco accidentado, sin embargo, por haber sido los recursos naturales sometidos por mucho tiempo al monocultivo de la caña, pastizales mal manejados (sobrepastoreo por la ganadería extensiva), (MIMARENA, 2011a), sustitución de especies forestales por la tala, tumba y quema de bosques para la siembra de cultivos anuales de subsistencia, presentan serios problemas de degradación.

En la cuenca del río Higuamo, es notoria la deforestación y erosión de los suelos en forma laminar, en surcos y cárcavas. Predominan las actividades agropecuarias especialmente el cultivo de la caña de azúcar y los pastos. (MIMARENA, 2011a). Es palpable el abandono, postración y estado de miseria en estas comunidades donde los servicios básicos, agua potable, caminos vecinales, salud, entre otros son insuficientes.

El río Higuamo y sus afluentes en la parte media de la cuenca se encuentran prácticamente secos y llenos de contaminantes sólidos y líquidos. Todos los vertederos de desechos sólidos de los municipios de la cuenca son a cielo abierto. Solo la población de San Pedro de Macorís dispone de planta de tratamiento de sus aguas residuales, la cual no funciona cabalmente (MIMARENA, 2011a). Por esa razón todos los ríos de la cuenca presentan un alto grado de contaminación de las aguas, situación que debe ser enfrentada a través de un plan de manejo de la cuenca que vincule y comprometa a toda la población.

El rio Higuamo es uno de las más contaminadas del país (para mas detalles ver Anexo No. 2), por fuentes industriales, domésticas, materia orgánica, metales pesados y otros, que son vertidos al rio. La cuenca comprende fundamental dos provincias: Hato Mayor del Rey y San Pedro de Macoris

Provincia de Hato Mayor del Rey

La provincia de Hato Mayor es una de las 31 provincias de la República Dominicana; forma parte de la Región Este, junto a las provincias de La Romana, San Pedro de Macorís, El Seibo y La Altagracia. La capital provincial es la ciudad de Hato Mayor del Rey, comúnmente conocida como *Hato Mayor*. (http://es. Wikipedia .org/wiki/Hato_Mayor). Es una de las provincias más reciente del país; fue creada el 3 de diciembre de 1984 por medio de la Ley No. 245. Sus primeras autoridades fueron escogidas en las elecciones de 16 de mayo de 1986. La provincia quedó integrada por los municipios Hato Mayor del Rey, Sabana de la Mar y El Valle(ver **Fig. 25**).

Fig. 25. Distribución de la Provincia de Hato Mayor (http://commons. wikimedia .org/wiki/File:Mapa_Politico.jpg

Limita al Norte con la Bahía de Samaná; al Sur con la provincia San Pedro de Macorís; al Este con la provincia El Seibo y San Pedro de Macorís; y al Oeste con la provincia Samaná, Monte Plata y San Pedro de Macorís (http://es. Wikipedia .org/wiki/Hato_Mayor).La provincia Hato Mayor tiene una extensión territorial de 1,329.29 km².[2] Por su extensión es la provincia número 15 del país y ocupa el 2.7 por ciento del territorio nacional. Tiene un total de 85 017 habitantes (ver **fig.26 y tabla 7**)

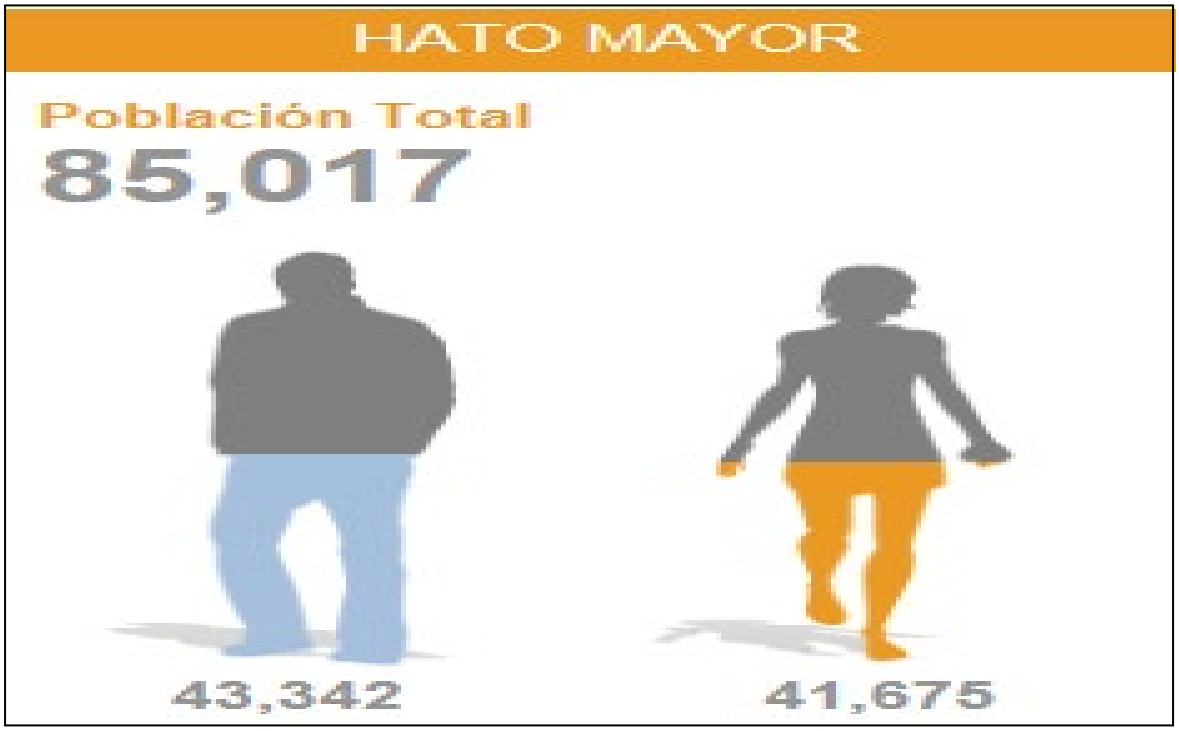


Fig. 26. Habitantes de la Provincia de Hato Mayor (http://sicen.one.gob.do/)

Superficie (En km2)	1,319.31
Densidad	414.8
Población infantil	1,626
Población preescolar menor de 5 años	7,762
Población joven 15 a 24 años	16,895
Población adolescente de 10 a 19 años	18,697
Población menor de 18 años	31,602
Población de 18 años y más	53,415
Población de 20 a 24 años	7,408
Población de 25 a 34 años	11,876
Población de 35 a 49 años	14,585
Población de 50 a 64 años	9,364
Población de 65 años y más	6,586
Población Urbana	63,012
Población rural	22,005

Tabla 7. Principales indicadores poblacionales de la Provincia de Hato Mayor (ONE, 2010).

Al igual que en otras provincias del país, la respuesta al desempleo y la pobreza en la zona ha sido el autoempleo y las microempresas. Un 34.70% de la población ocupada en Hato Mayor lo constituyen trabajadores por cuenta propia, lo que supera al promedio nacional de 38.9% así como al promedio de toda la región Este que es de 40.65%. La tasa de analfabetismo en la población entre los 15 y 24 años en el 2010 es de 24.7, y más del 50% no había alcanzado la educación secundaria Algunas tendencias poblacionales aparecen en las **Figs. 27 y 28**.

Fig. 27 Tendencia de la población de Hato Mayor en los año 1993, 2002, 2010. (http://commons.wikimedia. org/wiki/File:Poblacion_de_ Hato_Mayor_por _a%C3%B1o.png)

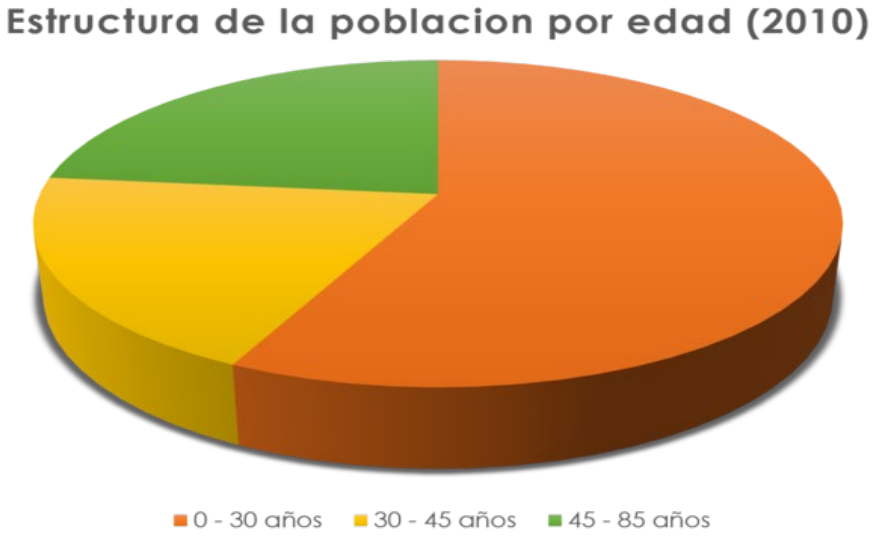


Fig. 28 Estructura de la población por edad, provincia Hato Mayor. Fuente: IX Censo Nacional de la Población y Vivienda 2010 (http://commons.wikimedia. org/wiki/ File:Estructura_de_la_poblacion _por _edad_ Hato_Mayor.png)

Provincia de San Pedro de Macoris

Limita al norte con las provincias Hato Mayor y El Seibo, al este con la provincia La Romana, al sur con el Mar Caribe y al oeste con las provincias de Santo Domingo y Monte Plata. La capital provincial es la ciudad de San Pedro de Macorís. (http:// es. wikipedia. org/wiki/San_Pedro_de_Macor%C3%ADs). Su economía gira principalmente en torno a la agricultura, ingenios de caña de azúcar, otros puntos importantes en su economía lo componen la industria de zonas francas y el turismo.

División administrativa

La provincia San Pedro de Macorís tiene una superficie total de 1.255,46 km². Está dividida en seis municipios y dos distritos municipales. Tiene unos 290 458 habitantes (ver **Figs. 29 y 30**)

Los municipios son:

• San Pedro de Macorís, municipio cabecera • Consuelo • Guayacanes	• San José de Los Llanos • Quisqueya • Ramón Santana

Los distritos municipales son:

- El Puerto
- Gautier

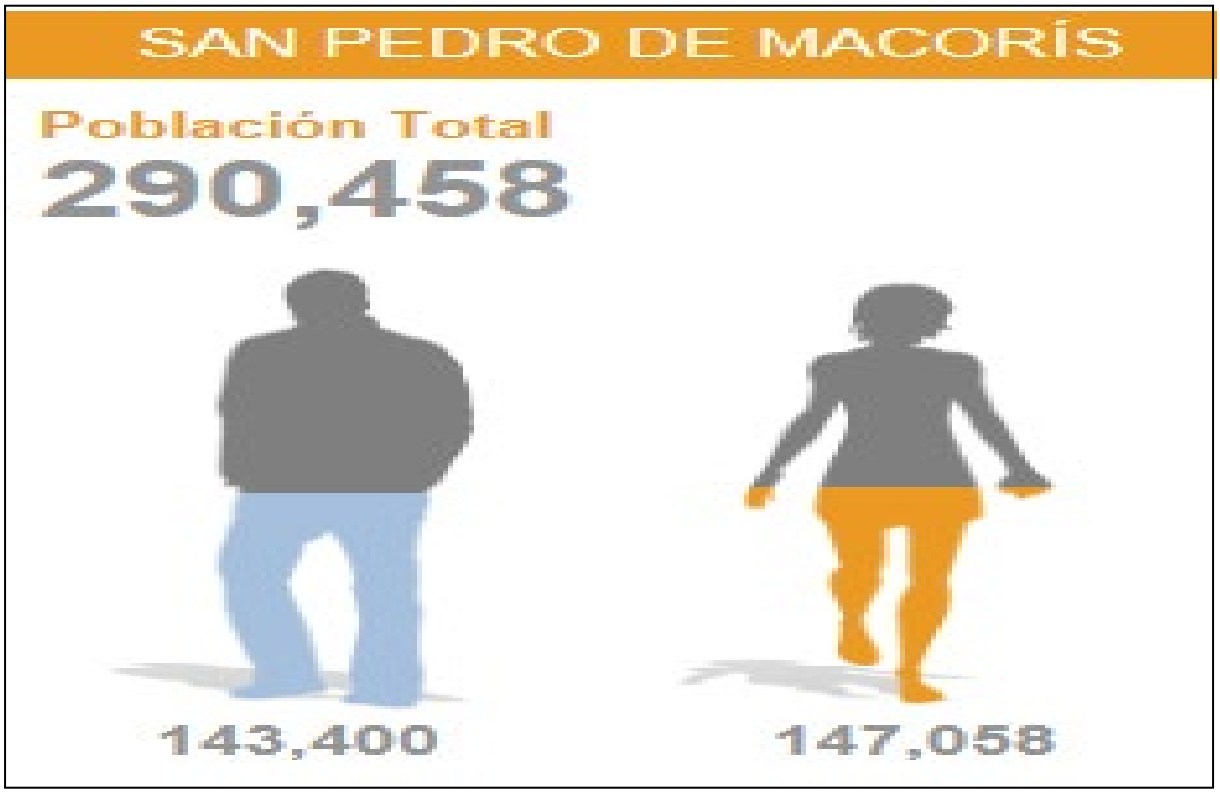


Fig. 29. Habitantes de la Provincia de San Pedro de Macoris (ONE, 2010)

Superficie (En km2)	1,254.34
Densidad	2,023.28
Población infantil	6,148
Población preescolar menor de 5 años	27,801
Población joven 15 a 24 años	60,588
Población adolescente de 10 a 19 años	63,756
Población menor de 18 años	109,367
Población de 18 años y más	181,091
Población de 20 a 24 años	27,765
Población de 25 a 34 años	42,444
Población de 35 a 49 años	53,173
Población de 50 a 64 años	28,450
Población de 65 años y más	16,611
Población Urbana	244,215
Población rural	46,243

Tabla 8. Principales indicadores poblacionales de la Provincia de San Pedro de Macoris (ONE, 2010)

Áreas protegidas en la cuenca del Rio Higuamo

a) Refugio de Vida Silvestre Río Higuamo

Mediante el Decreto No. 571 del 7 de agosto de 2009 **ARTÍCULO 30, s**e crea el **Refugio de Vida Silvestre Río Higuamo** con la finalidad de conservar la integridad de la gran alfombra de manglar que se forma a todo lo largo de la ría, comprendida entre la porción del estuario utilizada para fines portuarios y la confluencia de los manantiales que preceden la confluencia de los ríos Maguá e Higuamo, hogar de innumerables especies de la avifauna nativa, endémica y migratoria, así como poblaciones indeterminadas de animales estuarinos, costeros y marinos, actualmente amenazados por los altos niveles de contaminación de este enorme cuerpo de agua.(http://www.jmarcano.com/ecohis_/legales/dec571_8.html) Su superficie es de 18.5 kilómetros cuadrados

El Refugio de Vida Silvestre Río Higuamo, se caracteriza por la presencia de ecosistemas muy especiales. Se destacan el bosque ribereño, bosque de manglar,

humedales temporales, matorrales latifoliados y vegetación en los potreros.En los diferentes ecosistemas se distingue una gran variedad de estratos o tipos biológicos según el tipo de que se trate (Sanó et al, 2011). Se encuentran las hierbas o herbáceas, el tipo arbóreo y arbustivo, las lianas o bejucos (trepadoras y reptantes) y los estípites o palmas. Aquí se manifiestan áreas con buena representación de la vegetación.

Se han registrado 221 especies de plantas vasculares de las cuales 10 son Endémicas, 196 Nativas de la isla Española, 3 naturalizada, distribuida en 192 géneros y 83 familias de plantas. De las 83 familias identificas, las que presentan mayor número de especies son: Meliaceae, Polygonacea, Rubiáceae, Verbenaceae, Fabaceae, Myrtaceae, Euphorbiaceae, Bombacaceae, Arecaceae, Borraginaceae, Caesalpiniaceae, Mimosaceae (Sanó et al, 2011).

Las áreas con ecosistemas mejor conservados son todas las franjas de bosque ribereño que va desde el puente viejo próximo a la Cementera, sobrepasando la desembocadura o la confluencia del rio magua con el río Higuamo. En la parte norte, existe un remanente de la vegetación original, con algunos individuos de árboles centenarioscomo son la Ceiba*, Ceiba pentandra*; *Pino macho*,*Zanthoxylummartinicense*; Caya amarilla, *Sideroxylumfoetidissimum*;Muñeco,*Cordialaevigatai*;Mangle rojo*, Rhizophora mangle*; *Mangle blanco, Lacunculariaracemosa*;Mangle negro de gran altura*, Avicenniagerminans*que mismo puede crecer hasta 30 metros de altura (Sanó et al, 2011). (Para más detalles ver **Anexo No.3**)

b)Refugio de Vida Silvestre Laguna de Mallén

Esta área protegida quedó establecida según el Decreto No. 571 del 7 de agosto de 2009 **ARTÍCULO 29.** Los límites de la misma están representados por la línea que bordea los manglares, ciénagas, caños y lagunas con un área de separación de 30 metros hacia fuera de los mismos.

Estos límites encierran una superficie de 1.41 kilómetros cuadrados. (http://www.jmarcano.com/ecohis /legales/dec571_8.html), y su propósito es resguardar el hábitat natural de numerosos bancos de garzas (reales, de rizos, cenizas, garcilones), patos migratorios y otras especies nativas y endémicas a determinar en lo adelante, las cuales ha escogido los manglares, cuerpos de agua y humedales asociados como su espacio favorito para la reproducción y convivencia, a pesar del estrés ecosistémico causado por la proximidad del ámbito urbano de San Pedro de Macorís, la zona franca industrial y las actividades agrícolas y ganaderas de su entorno.

Otras áreas de interés, desde el punto de vista ecológico, en el entorno de la cuenca del Rio Higuamo, donde se desarrollan planes de mejoramiento ambiental:

• Parque Ecológico Pedro Mir • Isla de la Mujer. • El Pico Blanco • Centros de protección y vigilancia • Rio Soco	• Playa el Muerto • Saneamiento del desagüe del barrio Pedro Justo Carrión. • Laguna de Los Guardias