

STATUS OF HAITI NBSAP

The Haitian government initiated a Global Environmental Fund (GEF) Biodiversity Protection Enabling Activity to prepare a National Biodiversity and Action Plan (NBSAP) and establish a Clearing House Mechanism, with World Bank assistance. In order to meet obligations under the CBD, the MDE conducted a series of national and international consultations (thematic workshops on biodiversity, seminars etc), whose major objective was to capture views on the main biodiversity issues and gain a clear sense of the measures needed for the sustainable management and conservation of the country's biodiversity. Under this initiative, the Haitian government submitted an interim First National Report to the Conference of Parties (COP) in 1997.

However, The NBSAP was never completed due to the suspension of World Bank operations in the country as a result of the controversial elections of May 2000. The prepared NBSAP profile calls for a vision that links the future of the Haitian nation with the way local population plans to use the diversity of biological resources. This future, to become sustainable, needs to integrate a management approach that reconciles Haitian people with their environment and satisfies their present needs without compromising the well – being of the future generations.

The NBSAP profile has retained five specific objectives : 1) to promote education awareness among the public and decision-makers on biodiversity issues, in order to increase their understanding on the interest to conserve Haitian biodiversity and recognize its contribution in the process of sustainable development 2) to undertake immediate measures to stop biodiversity loss in natural areas and ecosystems of Haiti 3) to conserve biodiversity resources of the country 4) to develop and implement ecological management approaches to preserve and use biodiversity on a sustainable manner, and 5) to implement institutional, legal and fiscal measures in support to biodiversity conservation and sustainable use of components of biological diversity.

PROFILE OF THE HAITI NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN WITH IMPLICATIONS FOR BINATIONAL ACTIONS WITH DOMINICAN REPUBLIC. TOUSSAINT J. Ronald¹, NEAP SECRETARIAT/MINISTRY OF ENVIRONMENT, HAITI

I – INTRODUCTION

The Convention on Biological Diversity (CBD) is a key instrument that serves to promote and guide actions for biodiversity conservation and the sustainable use of biological resources. Since August 1996, Haïti has ratified this international convention. When this instrument is ratified by a country, this latter is bound by its term to undertake the preparation of a National Biodiversity Strategy and Action Plan (NABSAP). In order to meet her obligations under the CBD, Haïti conducted a series of national and international consultations (thematic workshops on biodiversity, seminars etc) whose major objective was to capture views on main biodiversity issues and gain a clear sense of the measures for the sustainable management and conservation of the country's biodiversity.

While the NABSAP is being finalized, this paper aims at offering an overview of the state of biodiversity in Haïti, vision, priorities and main substantial options covered by the strategy and action plan. The document addresses also the issue of Hispaniola biodiversity conservation by focusing on binational actions that could be both implemented by Haïti and Dominican Republic (DR).

II – THE CURRENT STATUS OF BIODIVERSITY IN HAÏTI

Background

The Republic of Haïti shares with the DR the second largest island of the Caribbean also known under the name of Hispaniola. Haïti occupies one third (27750 km²) of the territory on the western side of the island. It is located between 18° and 20° North of latitude and between 71°30 and 74° 30 West of longitude. It is surrounded by the Atlantic Ocean to the North, the Caribbean Sea to the West and South and by the DR to the East. The Haitian coastline covers 1535 km before giving a way to a relatively narrow continental shelf of 5000 km². Its also comprises five satellite islands: La Gonave (670 km²), La Tortue (180 km²), Ile-à-vache (52km²), Cayémites (45km²) and La Navase (Navassa island : 7 km²).

Today, the country is one of the most densely inhabited regions in the Caribbean. The current overall density population is 286 inhabitants per km² . Haïti's population is estimated to be 8 millions with a 2,08 % annual growth rate (IHSI, 2000). According to some sources, the population will reach 20 millions by 2040 in absence of a strict population control policy. Haïti has the lowest expectancy of life and human development index among Latin America and Caribbean countries (UNDP, WORLD BANK 1997). Crisis for space, land in the country is tremendous. An array of complex social issues complicate sound and sustainable management of biodiversity. Population growth and poverty create important stresses on the environment.

Haïti lies in the Low Subtropical Region (18 – 20 degrees North Latitude), not truly tropical but rather that portion of the Tropical and Warm Temperate Regions which is free of frost at low elevations above sea level and in which the temperature range is significantly wider than in the deep tropics.

Haïti's climate is a result of the country's position in the Caribbean and its mountain terrain. Hurricanes, Tropical storms, natural fire are largely influenced by Caribbean climate factors. These have shaped the natural ecosystems of the country.

Haïti is an Amerindian word that means *Mountainous land*. Mountains occupy 75% of the country and their orientation greatly influences local rainfall and insolation regimes. The climate of the plains and lower montane regions is primarily tropical monsoonal, while that of the montane area is sub-tropical. The dominant winds are from the northeast and the northerly directions. As a result, the moist ecosystems generally occur on the windward mountain slopes and the sub-humid ecosystems occur in the rain shadow of the leeward exposure. Most precipitation is brought by the North East Trade Winds and to a lesser extent by winds from the east.

In general, precipitation increases and evapotranspiration decreases as a function of elevation in Haïti. The major portion of the rainfall that occurs on the island is orographic, or the result of warm moist air rising rapidly as a result of the mountainous topography. The humid and wet montane systems are the source of major rivers and streams in the country, as well as the aquifers of the highly porous limestone substratum.

Dissected by numerous mountain ridges and flowing across two relatively narrow peninsulas, Haïti's rivers (more than 158) are mostly short and swift flowing. The exception is the Artibonite river which originates along the border with the Dominican Republic and flows for approximately 290 km. Along this river is found the country's major hydroelectric power generating facility (*Le Barrage hydro-électrique de Peligre*).

According to some theory, the island of Hispaniola was created by the uplifting of three major land masses and their subsequent collision over geologic time. These land masses were derived from oceanic crust, uplifted and influenced by the level of sea. Most marine terraces were exposed during the Pleistocene era. There have been no major sea level changes in the last 10,000 years.

In Haïti, exposed rock formations are igneous, metamorphic and sedimentary origin. The latter formations are the most abundant (80%) and are represented by limestone deposits from the middle and upper Eocene era.

Accordingly, the parent material of soils in Haïti is primarily limestone. Pockets of basalt soils (mostly igneous rock) are found throughout the country, giving rise to soils that are less fertile and more highly eroded. More highly weathered oxisoils and beauxitic soils (*sols ferralitiques et sols ferrugineux*) are a feature of several montane areas of the country.

Haïti's biodiversity

The Caribbean is an internationally recognized biodiversity hotspot, ranking fourth in the world for major diversity indices (Meyers et al 2000) and perhaps containing the highest concentration of endemic species on a land area basis.

FLORA

Haïti is one of the richest countries in the Caribbean in terms of biological diversity. Certain botanical families are particularly rich in endemic species, notably the Orchidaceae, Melastomataceae, Rubiaceae, Flacourtiaceae, Poaceae, Urticaceae and Asteraceae (Vilmond Hilaire 2000). This is compared to other families, such as the ferns and allies that show a much lower level of endemism of the island. Very little is known of the basidiomycete fungi, though recent investigations conducted in the DR indicate high endemism among the saprophytic fungi families of the moist and wet forests (Lodge 2000).

In Haïti, biological resources play an important role in the development of the nation. They are sources of food, firewood, construction of materials, medicines, ecosystem functions, or aesthetics etc.

The geologic history of Hispaniola characterized by repeated changes in level sea and the highly varied geomorphology provides a wide range of abiotic factors that favor habitat diversity and had given rise to significant local endemism.

Haïti in spite of severe environmental degradation problems has, together with the Dominican Republic, the second most diverse flora in the Caribbean, after Cuba. Floristic studies among the vascular plants invariably reveal new species to science, particularly in biological rich areas. According to a floristic study conducted by the University of Florida in the 1980s and 1990s, an inventory of orchids of Macaya National Park (in the Southern Peninsula) revealed that a third of 134 species were undescribed at the time of their collection. The total orchid flora, occupying less than 10 km², represent roughly 40 % of the three hundred fifty orchid species known to exist on Hispaniola (Dod 1993; Hespenheide & Dod, 1993).

Scientists who conducted inventories of Haïti's flora did not reach a consensus on existing vascular plant species. The number of those published in the literature ranges from 4,685 (WRI, 1998) to 5,242 (IUCN 1997). The dated treatment of the *Flore d'Haïti* (Barker and Dardeau 1931) suggests that over 5,365 vascular plant species are found in Haïti. It has been estimated that among these plants, 37% are endemic comprising approximately 300 species of Rubiaceae, 300 species of Orchidaceae, 330 species of Asteraceae, 300 Graminae and three species of Conifers (*Pinus occidentalis*, *Juniper juniperus*, *Juniperus ekmanii*). Overall, the Haitian landscape hosts, according to the Holdridge classification based on climate factors, a total of nine zones which supports the diversity of forest formations.

FAUNA

The country boasts a rich fauna as well, with more than 2000 species of vertebrates of which 75 % are considered endemic. The mainland and satellite islands reflect a high degree of endemism. A recent biological inventory of one offshore island, Navassa island (7 km²), found more than 800 species, many of which may not exist anywhere else in the world, and as many as 250 that might be entirely new to science (Center for Marine Conservation, 1999).

Mammals

Two native mammals are known to occur in Haïti: the Haïtian Hutia (*Plagiodontia aedium*) and the Giant Island Shrew: the *Nez long* (*Solenodon paradoxus*). Both are considered endangered and likely extirpated over much of their native range. The possibility of *Isolobodon sp*, a rodent, and *Nesophantes sp*, an insectivore, occurring on *Ile de la Tortue* (Tortuga Island) remains unconfirmed.

The highest diversity among the native mammals in Haïti are bats. There are seventeen species of which seven taxa, including species and sub-species, are considered endemic. The remainder of the native mammal diversity are aquatic and include the West Indian Manatee (*Trichecus manatus*), the West Indian Monk Seal, the Sperm Whale, the Pilot Whale and Dolphin species.

Birds

Very little current studies have been conducted in Haïti on the distribution of avifauna. It has been estimated that two hundred and thirty six (236) birds have been recorded on Hispaniola island. A quarter of these species are considered endemic.

Reptiles and Amphibians

Two hundred seventeen (217) species of reptiles and amphibians are known to occur in Haïti (Thomas 2000). Approximately 70 % of this diversity has been recorded in Haïti. Ninety eight percent (98%) are endemic to Hispaniola with about a third of the species occurring in Haïti only. Five sea turtles, according to *Ottenwaldder* 1996, have been inventoried in Haïti. They are: *Eretmochelys imbricata* (found in Anse à Pitres, Ile à vache, Côtes de fer), *Caretta caretta* (found in Belle Anse, Cayes-Jacmel, Anse à Pitres), *Dermochyles coriace* (found in Tiburon) and *Lepidochyles olivacea*. Two terrestrial iguanas are recorded: *Cyclura cornuta* and *Cyclura ricardi*. In Haïti is also found the American crocodile often known under the name of Caïman.

Invertebrates

Most of the faunal diversity represented by the invertebrates, is unknown to science or insufficiently studied (Rawlings 2000). It is estimated that at least three-quarters of this group of organisms have never been described.

From specific studies that have been carried out, we know that Haïti harbors an exceptional fauna of terrestrial frogs. From 49 Eleutherodactylus species described for Hispaniola, 20 species come from Castillon, a small village located North to the *Massif de la Hotte* and close to the small city named Leon. The *Massif de la Hotte* is known to host the most diverse frog species in the Caribbean. At least, 26 Eleutherodactyles species have been recorded. For this kind of fauna, Haïti contributed a lot to the world wide biological diversity in terms of new species discovered: *Eleutherodactyles Amadeus* (Plaine Formond/Macaya Park), *Eleutherodactyles thorectes*, the smallest specie known from Hispaniola and the genus .

Since the invertebrates contain the highest diversity of organisms at the species level, it is reasonable to argue that most of biodiversity of Haïti remains largely unknown.

Ecosystems

The diversity of life is also found at the ecosystem level. Indeed, it is possible to encounter an impressive range of ecosystems while traveling from high altitude habitats (e.g forests, wooded areas, agrosystems), to inland freshwater ecosytems (e.g. lakes ponds, rivers, springs and other wetlands) to coastal and marine ecosystems (e.g. mangroves forests, coral reefs, estuaries, seegrass beds, wetlands, etc).

Genetic diversity

The genetic diversity of native species of Haïti is also largely unknown. A limited of economically important native species were selected in the late 1980s. Progeny testing, the establishment of seed orchards and seed production areas and the harvest of seed has been undertaken for native species in an effort a) to maintain genetic diversity and b) to ensure that the best available tree germplasm be available to peasant farmers for reforestation and agroforestry purposes.

Biodiversity loss in Haïti

Paleontological evidence indicates that a major portion of the mammal diversity of Haïti has gone extinct, largely represented by rodents, ground sloths, monkey and shrews that were endemic to Hispaniola (Woods and Ottenwader 1992).

The threatened status of Haïti's flora, described in the IUCN's 1998 *Red List of Threatened Plants*, includes over one hundred taxa representing 31 families. The following families constitute

the highest number of threatened species: Flacourtiaceae (13), Bignoniaceae (10), Melastomataceae (10), Sapotaceae (8), Leguminosae (8). Given insufficient data, this list should be however considered under-estimated.

Some major factors and driving forces have contributed to biodiversity loss in Haïti. They include:

- *Poverty and population growth* that negatively impacted natural ecosystems and drive to the erosion of biological diversity;
- Introduction of alien species;
- *Habitats fragmentation* due to increasing pressure of agricultural sector and other human activities: urban development, transportation corridors etc;
- *Institutional issues* characterized by the following: confusing roles among several institutions involved in biodiversity, lack of a strong commitment of the Non Governmental Organizations (NGO) Community to conservation causes, political instability and fragility of the institutions, lack of well-trained human resources in biological sciences, conservation biology and protected area management, poor financial support for managing biodiversity, Lack of political support to the Ministry of Environment etc
- *Policy issues* that cover aspects such as: failure to integrate biodiversity concerns into non-environmental sectors (National development Agenda), interagency conflicts and contradictory policies among them, regressive taxation etc

III – OVERVIEW OF THE HAITI BIODIVERSITY NATIONAL STRATEGY AND ACTION PLAN

A – THE NATIONAL STRATEGY

National vision

The National Strategy pleads for a vision that links the future of the Haitian nation with the way local population plans to use the diversity of biological resources. This future, to become sustainable, needs to integrate a management approach that reconciles Haitian people with the environment and satisfies their present needs without compromising the well – being of the future generations.

Guidelines

The Strategy identifies the following guidelines to facilitate selection and implementation of actions:

- Biodiversity initiatives, programmes and projects should try to be in consonance with and to build on the scope of actions covered by the National Environmental Action Plan (NEAP) and other sectoral plans;
- Reduce the widespread poverty and the effects of poverty on communities who rely on biodiversity for their survival and prosperity. Biodiversity actions need to be correlated with measures that achieve sustainable population growth (national population control) and a sound strategic plan against poverty that provides employment opportunities and diversifies income generation activities;
- Promotion of the ecosystem approach as an useful tool to debouch on a land, water and living resources integrated strategy that favors a fair conservation and sustainable use of biodiversity;
- Address gender concerns by promoting gender equity with regard to roles, responsibilities and rights in biodiversity programmes and management;
- Promote a decentralizing approach to manage biodiversity by strengthening the haitian civil society and territorial collectivities while building their capacities to take appropriate actions to conserve biological diversity and to facilitate sustainable use of biodiversity components and the fair and equitable sharing of the benefits arising from the utilization of genetic resources;
- Develop an increasing partnership with the private sector in favor of conservation causes;
- Valorize traditional and local knowledge on managing biodiversity while paying a particular attention to the Intellectual Property Rights;
- Articulate national actions with what is being undertaken in the context of wider Caribbean in matter of biodiversity;
- Synergy with related international and regional Conventions and Protocols (Desertification, Climate Change, Ramsar, CITES, SPAW, Land based Convention, Sea Convention etc)

Priorities of the Strategy

By now, five main priority axis covering a number of sectors of activity have been identified to deal with current issues faced by sustainable management of biodiversity in Haïti:

Priority number one: Conservation of biological diversity

This theme concerns the in-situ conservation, conservation and sustainable use of natural areas providing water resources and buffering natural risks and hazards, conservation and valorization of genetic resources, ex-situ conservation.

Typical sector activities include the following:

In-situ conservation

- Increase the number of protected areas to cover all major ecosystems in Haïti (improving the representativeness of country ecosystems) by extending the percentage of territory covered in protected areas from 0,35 to 2 %;
- Institute a more coherent System of National Protected Areas (SNAP) including a management policy for protected areas and create the ONGAP, the autonomous National Office to Manage Protected Areas;
- Establish a more efficient surveillance system to ensure that the SNAP is protected from encroachment of any kind including sustainable security through the creation of an environmental police;
- Special recovery measures targeting rare, threatened or vulnerable faunal and floral species;
- Promote environmentally friendly income generating projects for communities living in the buffer zones of protected areas;
- Facilitate biodiversity conservation in the urban areas;
- Initiate measures to rehabilitate and restore degraded dry lands ecosystems.

Conservation and sustainable use of natural areas providing water resources and buffering natural risks and hazards

- Delineate and protect priority zones or critical ecosystems (critical areas for water resources) in strategic watersheds;
- Develop a legal framework for the utilization of ground water resources;
- Implement the Water National Policy;
- Promote relevant projects to strengthen local communities capacities to deal with with natural risks and hazards;

- Support and develop best practices or methods in forest management and create reforestation areas in strategic watersheds of the country;
- Promote sustainable management of inland water ecosystems;
- Promote Integrated watershed and coastal management;
- Finalize and implement the Action Plan for preventing natural risks and hazards.

Conservation and valorization of genetic resources

- Implement policy measures that support the sustainable use, conservation and valorization of medicinal plants;
- Develop and implement a legal framework for Intellectual Property Rights and the regulation of access to genetic resources;
- Support the Haitian Network for Medicinal Plants, the *REMÈD FÈY*;
- Develop and implement the National Plan for phytogenetic resources;
- Promote and create market opportunities for local species and varieties under-utilized;
- Promote an agrobiodiversity approach by the adoption of practices that support the valorization of local genetic resources neglected or under-utilized and guarantee a sustainable development of livestock production and agriculture.

Ex-situ Conservation

- Develop a realistic ex-situ conservation system adapted to institutional capacities of the country by restoring existing herbaria, promoting communal arboreta with endangered or threatened species, supporting private initiatives (aquaria, Palm gardens etc);
- Strengthen existing ex-situ conservation facilities and revive the project to create the first botanical garden in Haïti in the site of Habitation Leclerc (South of the Port-Au-Prince).

Priority number two: Education, identification and monitoring of biodiversity components

- Incorporate biodiversity issues in Universities curriculum and support their integration into environmental education manuals ;
- Develop promotional materials, biodiversity awareness thru educational campaigns to the radios in order to ensure that the haitian public is specifically aware of biodiversity conservation issues and that they clearly understand their role in conservation;
- Complete or refine, under a step by step approach, local or national inventory on biodiversity to set up monitoring plans with clear objectives and indicators;
- Establish a data collection system on biodiversity;
- Publish national report on the status of Haitian biodiversity;
- Establish links with biodiversity networks.

Priority number three: Sustainable use of components of biological biodiversity

- Develop and promote a forestry finalized on the issues of conservation;
- Support initiatives dedicated to develop ecotourism in Haïti;
- Promote management and use of halieutic (fish) resources in a manner compatible with conservation issues;
- Take appropriate steps to formulate a Sustainable Agriculture Plan for the country.

Priority number four: Control of alien species and management of Genetically Modified Organisms

- Address the threats posed by invasive alien species on Haitian biodiversity by promoting awareness on these threats, identifying Haitian needs and priorities in this field and developing policies and legislation;
- Set up enabling activities to assess the status of biotechnology development in the country and create an adequate institutional framework for the management of biotechnology issues;
- Ratify the Cartagena Protocol on biosafety and formulate national legislation to regulate the local use of Genetically Modified Organisms ;
- Facilitate Haïti access to relevant foreign technologies that have potential to conserve and use in a sustainable way biological resources;

Priority number five: Set up a new legal, regulatory and institutional framework to manage haitian biodiversity

- Implement the new institutional framework, the Office National de Gestion des Aires Protégées (ONGAP), consecrated by the NEAP;
- Actualize the legal framework related to biodiversity issues in particular Laws on biodiversity, biosafety and access on benefits sharing;
- Sign and ratify other related international or regional Conventions and Protocols.

B – THE ACTION PLAN

Objectives

- To promote education awareness among the public and decision makers on biodiversity issues in order to increase their understanding on the interests to conserve haitian biodiversity and recognize its contribution in the process of sustainable development;
- To undertake immediate measures to stop biodiversity erosion in natural areas and ecosystems of Haïti;
- To conserve biodiversity resources of the country;

- Develop and implement ecological management approaches to preserve and use biodiversity on a sustainable manner;
- Implement institutional, legal and fiscal measures in support to biodiversity conservation and sustainable use of components of biological diversity;
- To actively set up a diversified international cooperation for the implementation of the national strategy and action plan.

Programmes and projects

By now, the Action Plan identified six programmes to be implemented with objectives, components, stakeholders involved, sources of funding. These programmes are the following:

1. CONSERVATION AND MANAGEMENT OF BIODIVERSITY IN COASTAL AND MARINE ECOSYSTEMS IN NORTH EAST, NORTH, ARTIBONITE DEPARTMENTS AND THE SATELLITE ISLANDS
2. BIODIVERSITY PROTECTION AND SUSTAINABLE DEVELOPMENT IN NIPPES AND GRANDE ANSE REGIONS
3. SUSTAINABLE MANAGEMENT OF THE MAIN LAKES AND POUNDS AND CONSERVATION OF WETLANDS IN THE MAIN LITE ISLANDS OF HAÏTI
4. SUSTAINABLE VALORIZATION OF HAITIAN BIODIVERSITY WITH A PARTICULAR ACCENT ON THE USE OF MEDICINAL PLANTS IN HAÏTI, ECOTOURISM AND AGROBIODIVERSITY
5. EXTENSION AND STRENGTHENING OF NATIONAL SYSTEM OF PROTECTED AREAS IN HAÏTI
6. POVERTY ALLEVIATION AND BIODIVERSITY CONSERVATION IN HAÏTI

At least, seven projects are envisaged to be or are being undertaken under these programmes. Among them are:

- Integrating biodiversity conservation into a tourism strategy in the North East;
- A biodiversity Trust Fund in Haïti;
- Binational initiatives for the sustainable management and conservation of Hispaniola biodiversity;
- etc

IV – BINATIONAL ACTIONS FOR BORDER COOPERATION IN BIODIVERSITY WITH DOMINICAN REPUBLIC

The following is some orientation elements intended to address the problems of environmental management and rational use of Hispaniola biodiversity. These elements need further deep discussions with DR institutions representatives

1 – GENERAL VISION

- Build institutional and human capacities of both Haïti and DR to enable them to meet their commitments in the context of CBD;

- Institute an environmental normative framework for Hispaniola centered on challenges related to biodiversity conservation and reorientation of respective fiscal policies to facilitate measures for conservation causes;
- Envisage technological cooperation mechanisms and financial support for the sustainable use and conservation of components of Hispaniola biological diversity ;
- Contribute to achieve the global goal represented by sustainable development.

2 – GUIDING PRINCIPLES

- The Convention on Biological Diversity signed and ratified by the both countries should constitute the central and strategic planning framework to guide actions to sustainably conserve and manage Hispaniola biodiversity ;
- Build on other elements and agreements cooperation linking both Haïti and DR and for which there is a consensus;
- Reach a common understanding on implications of a binational strategy for Hispaniola biodiversity and related concepts (binational projects , insular ecosystems etc);
- Incorporate views and prospects of civil societies of both countries in order to contribute to an effective decentralizing approach to manage biodiversity (co-management with communities and territorial collectivities).

3 - PRIORITY

- Achieve identification and description of main Hispaniola ecosystems in order to set up for each of them conservation priorities ;
- Achieve the establishment of terrestrial and aquatic SNAP and apply to them appropriate management plans ;
- Create a Management and Information System for threatened species and other components of biological diversity ;
- Institute a common Trust Fund to support and promote Hispaniola biodiversity conservation ;
- Create an insular Technological Center centered on sustainable use and conservation of Hispaniola biodiversity ;
- Facilitate the implementation of a technical and scientific programme in relation to the management and protection of coastal and marine ecosystems;
- Develop sound environmental programmes in the Artibonite watershed.

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Strategic Area I: Restoration of critical coastal ecosystems and watersheds associated

The overall objective of this Area is to maximize the sustainable benefits to local communities from using resources within watersheds and coastal zones to generate food, employment and income, supply safe water and conserve biodiversity resources for the benefit of local and global communities.

Activities could be grouped into the following closely related components:

- **Development and Implementation of planning and management tools/guidelines** and other appropriate mechanisms to prepare integrated watershed and coastal areas management plans and to promote environmentally sound practices and forms of land-use, watershed management and coastal development;
- **Catchment afforestation and revitalizing farming systems** aiming to increase forest cover and arrest soil degradation through production of seedlings, tree planting, agroforestry techniques, soils conservation practices with the full involvement of communities; This component will also contribute to create forests to feed important aquifers and protect different sources of water.
- **Microprojects** consisting of small investments funds to generate incomes and which can directly address poverty concerns related to the communities;
- **Establishment of Marine Protected Areas** through relevant biogeographic criteria, empowerment of responsible stakeholders, zoning plans, co-management partnership, research and monitoring programme etc;
- **Protection of mangroves and coral reefs from encroachment and destruction** by giving more responsibility to fishermen organizations, replanting mangroves and formulating appropriate community management plans and promoting the recovery of damaged reefs thru restoration techniques (transplanting corals, construction of artificial reefs, farming corals etc);
- **Wetlands Management (Coastal wetlands or inland waters that are wetlands)** intended to work closely with communities to conserve the wetlands and use them sustainably in order to improve their buffering capacity;

- **Development of Ecotourism.** Sites with great potential of ecotourism will be identified in collaboration with local entrepreneurs and Territorial collectivities. Action plan to promote ecotourism will be elaborated and implemented.
- **Implementation of measures to promote sustainable fisheries management** by vulgarizing sound methods of fishery, establishing fishery data base (information on fish biology and ecology, stock size, qualitative and quantitative information on aquatic biodiversity, socio-economic characteristics of fishery stakeholders etc);
- **Regulation of land-based sources of pollution** emphasizing (with Municipalities) on the rehabilitation of the existing waste treatment facilities or construction of new facilities, demonstrating the use of artificial and natural wetlands in waste treatment and construction of dry or composting toilets, education etc;
- **Development of water projects.** Integration of hydroprojects and irrigation/drainage projects, with the participation of private sector and user associations, within the IMWCA approach will be also promoted. In this context, sustainable mariculture could be also encouraged.
- **Research and Monitoring of implementation success and impacts.** Collaboration of specific Universities or Environmental Groups will be profited by setting a monitorable performance indicators to generate different relevant information to measure progress and impacts. Research will be encouraged to identify and assess, in the impact area, available water supplies (quantity and quality), projections of future use, impacts on aquifers, evaluate the efficiency of existing piezometer or hydrometeorological collection networks for appropriate measures, promote the use of GIS to create database on water resources and their management in a word ***establish a National Information System on Assessment and Utilization of Water Resources for the decision support system.***

Strategic Area II : A new Institutional and Legal framework to address Integrated Management of Watersheds and Coastal Areas

The objective of this Strategic Area is to put in place innovative legal and institutional mechanisms and instruments to overcome obstacles, facilitate the planning and improve the overall governance of the sector related to the Integrated management of Watersheds and Coastal Areas. The following represents some important activities that could be achieved:

- **Elaboration/ Finalization of relevant Policy instruments related to water/watershed and coastal zones.** The valorization, conservation, management and appropriate use of watersheds and coastal zones rely on adequate policies at the national and local level. In this context, a remarkable

efforts will be envisioned by Haitian competent authorities to a) prepare, as recommended by the *Atelier de Concertation Inter-Ministérielle pour la Gestion des Bassins Versants*, a Consensual National Policy on Watersheds Management b) take steps to formulate the National Action Plan to Combat Desertification c) finalize the Biodiversity National Strategy and Actions Plan as well the National Communication on Climate Change;

- **Decentralization and Institutional Strengthening.** This component will cover actions such as: a) Creation, as a recommendation of the *Atelier de Concertation Inter-Ministérielle pour la Gestion des Bassins Versants*, of Management Authorities in Strategic Watersheds (Strategic Councils) to promote stakeholder participation and where representatives of the civil society can be empowered as decision makers and as partners in project execution and monitoring and in integrated management of watersheds and coastal zones. b) Adequate measures to concretize the creation of the *ANGRE*, the National Agency for Water Management and solve jurisdiction conflicts among State Agencies;
- **An innovative Legal Framework.** It will be critical that the work initiated both by the MARNDR and the MOE to revise legislation related to watersheds be achieved and adopted by the Haitian Parliament. Efforts will be also done to facilitate the adoption of the very important General Law on Environment (*La Loi Cadre sur l'Environnement*) and the General Law on Water which includes important articles on a National Fund for Water Management and important measures to protect ground water. Standards in relation to EIA and other practices including aquaculture and mariculture should be envisioned by competent authorities. The legal system will be also completed by integrating critical multilateral agreements for watersheds and coastal zones such as Cartagena Convention (Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region) with its three Protocols namely: The Protocol Concerning Cooperation in Combating Oil Spills, The Protocol Concerning Specially Protected Areas and Wildlife (SPAW) and The Protocol Concerning Land-based Sources of Marine Pollution etc;
- **Human Resources Capacity Building for Integrated Management of Watersheds and Coastal Areas.** Given the lack of well-trained human resources involved in the sector, the objective is to strengthen water/watersheds and coastal zones institutions by training officials and decision makers, professionals, managerial staff and community leaders and organizing information campaign targeting key stakeholders etc.

Strategic Area III : Reduction of Communities' Vulnerability to Natural Disasters

The focus will be to prepare communities for and respond to natural and human-induced disasters such as floods, droughts, fires and non human-induced disaster like Hurricanes. Actions will include:

- **Improvement of the decision support system in the matter of Natural Disasters Management.** It will involve a non limited activities such as consolidation of hydrometeorological units and capacity building in this field, strengthening of participating structures such as National, Regional and Local Committees for Natural Hazards Management and Risk management Services or Directions, financing critical infrastructures etc;
- **Support to the formulation or implementation of relevant policies and strategic planning.** Efforts will be accomplished to initiate the National Communication on Ozone Depletion and the National Action Plan to Combat Desertification, to implement the existing National Action Plan to Natural Disasters and Risks through different kinds of consultation process, workshops and seminars, preparation of Detailed Implementation Plans and to have for exposed agglomerations urban environmental land use planning as a preventive tool etc;
- **Support to Awareness activities.** It will strengthen awareness at the national level thru radio information campaigns, training materials, mobilization of the civil society thru NGOs etc.

Strategic Area IV: Transboundary Cooperation in Integrated Management of Watersheds and Coastal Areas with Dominican Republic

The objective is to facilitate border integration with Dominican Republic (DR), foster environmental management in the areas of Watersheds and Coastal Zones Management and strengthen national Agencies of both countries concerned with environmental planning and natural resources use and promote creation of mechanisms for joint interagency activities in support of sustainable development of borders populations of Haiti and DR. Actions could include:

- **Institutional and Legal Capacity Building.** Efforts could be accomplished by both countries to have the existing *Commission Mixte Haïtiano- Dominicaine* played a more proactive role in the planning process for development of the border regions. The *Commission Mixte Haïtiano-Dominicaine* could be evolved into a Regional Secretariat, an operating structure dealing with binational border development programs. In the same way, the Hispaniola Development Fund being discussed between both countries, as a consequence of a debt alleviation process, should incorporate environmental issues in general and Watersheds/Coastal issues in particular. Haiti and Dr could also explore the possibility to negotiate and sign bilateral Treaties on Artibonite River and Fort Liberté and Mancenilla Bays etc;
- **Support to regional diagnosis of the border areas.** A process of regional diagnosis of each of the border areas could be made through specific workshops (binational approach, relevant programs and projects, implementation of Rio Conventions etc) and served as the basis for preparing policy guidelines and

strategies for structuring binational border development plans in Integrated Management of Watersheds and Coastal Areas or in other development issues.

- **Development and implementation of binational border projects and programs.** Haiti and DR could undertake dynamic cooperation to develop and implement joint projects and programs in the fields of Water/Watersheds and Coastal Zones with the vision to achieve the harmonious development of their respective border territories and for the benefit of their nations.

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