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# TROPICAL FORESTRY AND BIODIVERSITY (FAA 118 AND 119) ANALYSES

USAID -HONDURAS REPORT

**AUGUST 2009**

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Prepared by:

Pia Paaby Hansen, Main Consultant, and Ernesto Florez

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# ACRONYMS

AFE-COHDEFOR	Administración Forestal del Estado -Corporación Hondureña de Desarrollo Forestal
AESMO	Asociación Ecológica de San Marcos de Ocotepeque
AMHON	Asociación de Municipios de Honduras
AMITIGRA	Fundación Amigos de La Tigra
BICA	The Bay Islands Conservation Association
CAFTA-DR	Tratado de Libre Comercio para la República Dominicana y Centro América -Acuerdo de Cooperación Ambiental
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza
CCAD	Comisión Centroamericano de Ambiente y Desarrollo
CDB	Convención sobre Diversidad Biológica
CITES	Convención sobre el Comercio Internacional de Especies Amenazadas de Fauna y Flora Silvestre
CLME	Caribbean Large Marine Ecosystem
COP	Conference of the Parties
DAPVS	Departamento de Áreas Protegidas y Vida Silvestre
DIBIO	Dirección General de Biodiversidad
DIGEPESCA	Dirección General de Pesca
EAP	Escuela Agrícola Panamericana (Zamorano)
ENA	Escuela Nacional de Agricultura
EPE	Especies de Preocupación Especial
ESNACIFOR	Escuela Nacional de Ciencias Forestales
FHIA	Fundación Hondureña de Investigación Agrícola
FUPNAPIB	Fundación Parque Nacional Pico Bonito
FUCSA	Fundación Cuero y Salado
GEF	Global Environmental Fund
HIPC	Highly Indebted Poor Country
HN	Honduras
ICADE	Instituto para la Cooperación y el Desarrollo
ICF	Instituto Nacional de Desarrollo y Conservación, Forestal, de las Áreas Protegidas y la Vida Silvestre

IHT	Instituto Hondureño de Turismo
INADES	Instituto Nacional de Ambiente y Desarrollo
IRBio	Instituto Regional de Biodiversidad
IUCN	International Union for Conservation of Nature and Natural Resources
MBC	Mesoamerican Biological Corridor
MIRA	Manejo Integrado de Recursos Ambientales (Project)
MOPAWI	Mosquitia Pawisa Apiska MPA Marine Protected Areas
NGO	Nongovernmental organization PA Protected area
PREPAC	Plan Regional de Pesca y Acuicultura Continental
PROLANSATE	Fundación para la Protección de Lancetilla, Punta Sal e Texiguat
REHDES	Red Ecologista Hondureña para el Desarrollo Sostenible
RAMSAR	Convención relativa a los Humedales de Importancia Internacional
SAG	Secretaría de Agricultura y Ganadería
SAM	Sistema Arrecifal Mesoamericano
SENASA	Servicio Nacional de Sanidad Agropecuaria
SERNA	Secretaría de Recursos Naturales y Ambiente
SINAPH	Sistema Nacional de Áreas Protegidas de Honduras
SINEIA	Sistema Nacional de Evaluación de Impacto Ambiental
TNC	The Nature Conservancy
UMA	Unidad Municipal Ambiental
UNAH	Universidad Nacional Autónoma de Honduras
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNITEC	Universidad Tecnológica Centroamericana
UNICAH	Universidad Católica de Honduras
USAID	United States Agency for International Development
WAZA	Asociación Mundial de Zoológicos
WB	World Bank
WWF	World Wildlife Fund



# I. EXECUTIVE SUMMARY

The development of USAID/Honduras' new five-year country development strategy must take into account the state of the nation's tropical forests and biodiversity to inform the selection of development priorities. This report presents an updated assessment of biodiversity conservation to comply with Sections 118 and 119 of the Foreign Assistance Act of 1961, which will inform the development of USAID/Honduras' new five year country program strategy. The report provides recommendations for activities that will contribute to conservation needs. Furthermore, it is expected that this assessment will also serve as a planning tool to assist USAID/Honduras in better integrating environment concerns into its overall program.

This assessment took place during the month of August 2008 and was conducted by interviewing key government, non-government, university, and community leaders in biodiversity conservation, as well as a thorough review of all available secondary data and information. Additional interviews and site visits were conducted in June 2009 with focus on the issues and conservation priorities for coastal and marine resources.

## I.1 KEY FINDINGS

The assessment identifies a number of findings related to the lack of basic information and capacity in Honduras to sustainably manage and conserve its biodiversity and forestry resources. The assessment found that recent biodiversity research focuses on cataloging individual species and little has been written on the state of ecosystems, their flora and fauna, and the processes that maintain ecological functions. Additionally, the assessment team found little information on freshwater aquatic systems and an incomplete inventory and analysis of coastal and marine biodiversity and ecological processes.

Honduras has been evaluating its conservation system since 2002 by contrasting biodiversity within and outside of protected areas. While government authorities have established a 12% conservation goal for each terrestrial ecosystem found in Honduras, this assessment found that five major ecological systems are scantily represented in the national protected areas system.

Eighty-seven percent of Honduras' territory is considered to be of forestry vocation, but only 51% is under forest cover today. Historically, more than 90% of industrial forestry activities have taken place in pine forests. In 2006, 852,200 m<sup>3</sup> of pine and 20,900 m<sup>3</sup> of broadleaf species were legally harvested. It is estimated that 80,000 to 100,000 ha of forest are lost annually to the expansion of agriculture, forest fires, and illegal felling, especially in broadleaf forests. The coniferous forests, although stable in terms of area, have suffered from drops in productivity and genetic quality mainly due to fires, pests, and inadequate selective felling. This drop in pine forest production is of concern because the forestry sector on average generates 67,787 direct jobs and a similar quantity of indirect employment annually.

As of 2006, Honduras had established 12 marine protected areas (MPAs) totaling 1,054,976 ha, or 44 percent of total protected area in the country. Seven of these are located on the south coast and five on the north coast. The country has also gazetted six RAMSAR sites, five of which are on the coast and one that is an inland freshwater system (Lake Yojoa). Although there is good information for some protected areas and some species, overall coastal/marine resources in Honduras have not been systematically assessed. The understanding of coastal/marine ecosystems and their inter-connectedness remains limited. These resources are of growing economic importance, especially for the fisheries and tourism revenue and livelihoods that they support.

With respect to terrestrial systems, the assessment identifies the main causes of biodiversity degradation as loss or deterioration of forest cover, poaching of wildlife species, promotion of biofuel production, massive use of pesticides and synthetic fertilizers, disposal of untreated organic and inorganic solid waste, and

discharge of untreated wastewater into natural systems. Administrative weaknesses such as limited understanding of ecosystem functioning, regulatory gaps and ambiguities, lack of political will and priority for biodiversity conservation and sustainable forestry, weak environmental controls, widespread dominating poverty, and a lack of economically accessible energy alternatives all contribute to the lack of substantial progress on improving biodiversity conservation.

With respect to coastal/marine systems, the assessment identifies the main biodiversity threats as over-fishing and destructive fishing, climate change, habitat loss from poorly planned tourism and agricultural development, untreated agricultural and domestic discharges, degraded watersheds and altered freshwater flows, unplanned and unregulated coastal development, invasive species, and inadequate infrastructure to handle wastewater, solid wastes, and land drainage. Similarly, weak governance – including policy/legal/regulatory support, institutional capacity, political will, stakeholder engagement, and scientific/technical capacity – represents the overarching constraint to sustainable use and conservation of coastal/marine resources. The country should continue to move beyond its piecemeal approach focusing on individual protected areas to a more comprehensive, integrated approach focusing on landscape and marine-scale ecosystem-based management.

### **1.1.1 PRINCIPAL RECOMMENDATIONS**

Throughout the document, several issues have been highlighted as priorities or opportunities to improve biodiversity conservation and forestry management. The assessment proposes continued and expanded actions to strengthen national and local institutional capacities, strengthen the conservation role of protected areas, and promote sustainable resource use or economic alternatives.

### **1.1.2 INSTITUTIONAL STRENGTHENING**

- Disseminate information and educate national-level agencies and municipalities about the new forestry, wildlife, and protected areas law (Decree 98-2007);
- Harmonize environmental legislative mandates and regulation with the new decree, and identify needed regulatory instruments that will guarantee the implementation of Decree 98-2007;
- Support administrative strengthening of the Instituto Nacional de Desarrollo y Conservación, Forestal, de las Áreas Protegidas y la Vida Silvestre (ICF) to ensure effective implementation of Decree 98-2007 and other related regulatory instruments;
- Support the revision of protected area (PA) design using physical, administrative and financial gap analyses, and complete work on legalization and field delimitations of PAs;
- Institutionalize professional training and skills building programs within SERNA, ICF, and other national level institutions;
- Identify and support implementation of civil society coordination and environmental advocacy mechanisms.
- Assist DIGEPESCA to undertake public consultation and to finalize the revised Law on Fisheries.
- Provide technical assistance and institutional capacity building to ICF to enhance their capacity for MPA assessment, planning, and management.
- Undertake an analysis of sustainable financing options with recommendations to achieve greater national and local commitment and resources for biodiversity conservation.
- Provide technical assistance to the relevant national and local authorities needing to incorporate climate change vulnerability analysis and adaptation measures into their sectoral plans, including those responsible for watershed management, coastal development, and fisheries at a minimum.

### **I.1.3 STRENGTHEN THE CONSERVATION ROLE OF PROTECTED AREAS**

- Continue and accelerate programs that provide opportunities for communities to participate in PA management and develop alternative and environmentally sound income generation;
- Continue supporting sustainable tourism initiatives for national and international visitors;
- Encourage contracting of local residents as nature guides and support staff for tourism services;
- Scale-up and accelerate agroforestry plantations that include fuel wood crops, and short cycle and permanent crops;
- Continue to support micro-watershed management planning and other local land-use management instruments to strengthen municipal land use management (ordenamiento territorial) and quality control;
- Support national and local dialogue and actions to move towards integrated coastal management, strengthening resource management outside of protected areas and within a landscape and marine-scale scale.
- Promote and support field implementation of ecological integrity monitoring.

### **I.1.4 PROMOTE SUSTAINABLE RESOURCE USE OR ECONOMIC ALTERNATIVES**

- Explore and develop additional payment for environmental services mechanisms for conserving natural cover for CO2 capture, production of clean water, voluntary conservation opportunities (i.e. private conservation), and decreased vulnerability to natural disaster;
- Work with municipalities, water boards, and/or mancomunidades to integrate management of aquatic biological resources into natural resources and watershed management programs;
- Assess the possibility of using sustainable tourism certifications as a means to attract more tourists to Honduras;
- Work to promote sustainable and non-destructive fisheries, engaging all stakeholders in the value chain to increase compliance and sustainability. Promote the use of a strategic network of marine protected areas as fisheries management tools, and use marine spatial planning as a way to reduce conflicts between fishing and tourism sectors.
- Assist IHT, municipalities and the private sector to assess potential and best practices for a broader range of non-extractive tourism-related activities, such as bird watching, nature guiding, kayaking, rafting, diving, and catch-and-release recreational fishing.
- Incorporate land-use zoning using environmental goods and services criteria in natural resource management plans.

# 2. INTRODUCTION

Forests and biodiversity are key elements of the natural capital on which Honduras' economic development relies. As USAID/Honduras designs a new five-year country development strategy, it must take into account the state of the nation's tropical forests and biodiversity to inform the selection of development and investment priorities. This report updates the data, information, and analyses of the Mission's 2002 118/119 Assessment, and it presents insights from key stakeholders regarding the status and management of tropical resources and biological diversity over the past six years and directions for the future.

As detailed in Annex 1, the purpose of this report is to update the assessment of biodiversity conservation to comply with Sections 118 and 119 of the Foreign Assistance Act of 1961, as amended, and country strategy guidelines under ADS 201.3.4.11 and ADS 204.5. Based on this assessment, the report also provides recommendations to assist the Mission to define how its new five-year country program strategy contributes to conservation needs, as required by agency regulations. The update was conducted in August 2008 and prepared by Pia Paaby-Hansen and Ernesto Florez. Additional field work was conducted in June 2009 and the assessment further updated by Richard Volk, USAID/EGAT/NRM, on coastal and marine issues and opportunities. The report brings together all new information developed and published since the 2002 Tropical Forestry and Biodiversity Conservation Report, as well as interviews with key government and nongovernment specialists and with USAID's Manejo Integrado de Recursos Ambientales (MIRA) Project and other donor agency personnel, who provided additional documentation. A complete list of persons interviewed is included in Annex 3.

This report uses a widely accepted definition of biodiversity<sup>1</sup> as its guiding principle:

*...the variety of life on Earth at all its levels, from genes to ecosystems, and the ecological and evolutionary processes that sustain it. This definition recognizes that genetic diversity is the "fundamental currency of diversity" (Williams and Humphries, 1996) that is responsible for variation between individuals, populations and species. Therefore, it is an important aspect of any discussion of biodiversity. The interactions between the individual organisms (e.g., reproductive behavior, predation, parasitism) of a population or community, and their specializations for their environment (including ways in which they might modify the environment itself) are important functional aspects of biodiversity. These functional aspects can determine the diversity of different communities and ecosystems. There is also an important spatial component to biodiversity. The structure of communities and ecosystems (e.g. the number of individuals and species present) can vary in different parts of the world. Similarly, the function of these communities and ecosystems (i.e. the interactions between the organisms present) can vary from one place to another. Different assemblages of ecosystems can characterize quite diverse landscapes, covering large areas. These spatial patterns of biodiversity are affected by climate, geology, and physiography (Redford and Richter, 1999).*

The health of Honduras' terrestrial and marine ecosystems and diversity of its flora and fauna are critical to sustained economic growth, as they produce many of the goods and services the country's economy depends upon to thrive.

This updated Tropical Forestry and Biodiversity Assessment presents the status of biodiversity in Honduras (Section 3); current management and monitoring systems (Section 4); role of ecosystem services, ecotourism, and forestry (Section 5); national context in which biodiversity conservation can take place (Section 6); some of the nongovernmental and donor programs addressing forestry and biodiversity issues (Section 7); threats to biodiversity in Honduras (Section 8) and actions needed to overcome these threats (Section 9); and an assessment of USAID Honduras' proposed strategy and program (Section 10).

# 3. THE STATUS OF BIODIVERSITY IN HONDURAS

## 3.1. STATUS OF INFORMATION ABOUT BIODIVERSITY

The status of biodiversity resources in Honduras has changed little since it was described in the 2002 Tropical Forestry and Biodiversity Conservation report. Recent studies (Portillo-Reyes 2007; Mejía-Ordóñez 2007) have cataloged and analyzed the state of knowledge and research on biodiversity in the country. They found that although universities conduct research, mainly through students' theses, little new data have been generated over the past six years, and even less have been published or made available online.

In addition to national universities, international nongovernmental organizations (NGOs), including Nepenthes (Danish environmental NGO), The Nature Conservancy (TNC), and World Wildlife Fund (WWF), are funding gap analyses and other research to inform the Honduran government's natural resources planning and programming processes. Projects such as the MIRA Project of the U.S. Agency for International Development (USAID), Operación Wallacea, and the MesoAmerican Reef System (SAM) are generating biodiversity inventories and environmental analyses, yet many of these have not been published in the public domain. Independent researchers, such as Randy McCranie, Larry Wilson, Gunther Köhler, and others from the international herpetological community, are actively contributing to Honduras' biodiversity knowledge base. Their work includes presentations at the 2006 symposium on Conservation and Herpetology, which are available online, as well as biological inventories (McCranie and Castañeda 2006) that were produced as books for a wider audience (*The Amphibians of Honduras; The Amphibians and Reptiles of the Honduran Mosquitia; Reptiles of Central America*). Similarly, the inventories of "Birds of Honduras" (Gallardo 2006–2008) are available online (<http://www.birdsofhonduras.com/>).

However, since 2007 research efforts have waned as a number of public universities eliminated research thesis requirements, significantly decreasing biodiversity research efforts. The Honduran National Autonomous University (UNAH) established a research plan in 2008 with associated funding, but research remains a low priority for most public universities. Much of the ecosystem-level research underway today occurs through isolated opportunities, contracted by donor projects or other specific financing. Many research efforts involve the capture of specimens to serve as reference for future analysis. Because there are no financially viable museums or supporting laboratories, with the exception of the Zamorano facility, most research efforts are limited to field observations. Some government officials believe the Instituto Regional de Biodiversidad (IRBio) will fill this need. The IRBio is an initiative of the Central American Commission on Environment and Development (CCAD) for "promoting and circulating information for a sustainable use of biodiversity, generating information for the design of public policy in the region [Central America] visualizing problems and proposing viable regional solutions." This initiative will support CCAD country members to consolidate biodiversity knowledge by promoting research and by identifying and promoting opportunities for data publication. The IRBio initiative does not contemplate establishing a museum-type facility that can serve as a research focal point. Thus, for the foreseeable future, Honduras will not have a biodiversity research facility.

In 2008 the Honduran government prepared its Country Report for the 9th (COP 9) Meeting of the Convention of Biological Diversity (SERNA 2008). This report states that new information on biodiversity

concentrates on individual species (e.g., amphibians, reptiles, birds, and a few species of trees) with little attention being paid to understanding the processes that maintain populations, community structures, or ecosystem functioning.

The SAM program completed an eco-regional assessment and management strategy for the Mesoamerican Reef System in January 2008. Although not a scientific assessment of marine biodiversity *per se*, the assessment contains much useful information to guide priority setting and management options. Another report (June 2008) on the status, conservation, and use of the Nassau Grouper on the Honduras north coast contains good data, analysis, and recommendations. In 2006, Thorn, Medina, and Schoch published a report on the seabirds of Honduras. Unfortunately, very little has been investigated or published regarding the status of coastal/marine resources of the Miskito coast.

In reviewing and analyzing current information, we found a major gap in information on freshwater aquatic systems. For example, the taxonomic examples given in the wetlands research report are all bird species, while fish, macro invertebrates, and flooding-area dynamics are not discussed. Given that threats to sustained biological diversity outpace research and development of solutions to mitigate them, biodiversity conservation will continue to be a race against time. This is evidenced in the 2008 Biological Diversity–Country Report, which focuses many of its recommendations on preservation actions that are not always financially sustainable in the long term.

### 3.2. ENDANGERED OR SPECIAL CONCERN SPECIES

The biodiversity of Honduras is considered highly stressed with many endangered species. Using amphibians and reptiles as an example, nearly half (48.8%) of the 117 Honduran amphibian endemic species are threatened, endangered, or extinct, while nearly one-third (27.0%) of the 217 endemic reptiles are considered to have declining populations (Wilson and McCranie 2003a). The key recommendation resulting from Wilson and McCranie’s study is to strengthen protected areas and to increase their economic values together with creating alternative economic strategies for surrounding human populations. Much of the applied research on biodiversity conducted by the government, NGOs, and international cooperation agencies draws similar conclusions and recommendations, and is directed towards working with communities adjacent to “priority” protected areas (AMITIGRA, MOPAWI, ICADE, INADES, AESMO, FUPNAPIB, FUCSA, PROLANSTATE, BICA, and REHDES, Portillo 2007).

Honduras has a classification for species that need special attention (“Especies de Preocupación Especial” or the EPE list) including those listed in CITES (Cerrato et al. 2002). This list was last revised in 2002 and comprises 298 species (37 mammals, 133 birds, 53 reptiles, 72 amphibians, and 3 fish); it was based upon scientific monographs and expert opinions. This 2002 list (Annex 4) remains the most current list of all special concerns. The EPE species are further classified into three categories: (I) endemic species, (II) CITES Appendix I species, and (III) species with reduced populations. In 2005, additional work on the endangered species listing focused on identifying principal threats (Table 1, below, and Annex 4).

**Table 1. Special Concern Species – Especies de Preocupación Especial (EPE).  
Summary of 2005 updated list (Portillo 2007)**

Group	Total	Endemics	App. I CITES	Reduced Populations
Mammals	37	2	2	33
Birds	133	2	5	131
Reptiles	53	9	5	53
Amphibians	72	38	0	72
Fish	3	1		

No new information about plant species has been added since Bustillo's report (2002). The Red List of the International Union for Conservation of Nature and Natural Resources (IUCN 2007) identified 42 critically endangered and 38 endangered tree species in Honduras in 1994 (Annex 5). Other groups of plants, such as

bushes, shrubs, epiphytes, parasites, mosses, and lichens, have received very little research attention and are not reported as endangered.

Marine species or groups either endangered or of special concern include the following: all four species of sea turtles found in Honduras; whale shark; several other shark species; Nassau grouper; spiny lobster; queen conch; manatee; and several species of cetaceans.

### **3.3. ENDANGERED OR SPECIAL CONCERN ECOSYSTEMS**

The maintenance of biodiversity depends on the ability of conservation efforts to identify and manage the ecological processes involved (e.g., feeding patterns, reproduction areas, and times). Since many different forces affect species populations and their interactions with the environment and other species, the general tendency today is to work with ecological systems as conservation units. The Secretaría de Recursos Naturales y Ambiente (SERNA), together with TNC and WWF, has developed a conservation gap analysis (House and Rivas 2008) to better define conservation priorities. As a result of the study and subsequent planning, Honduras established a 12% conservation goal for the country's 59 terrestrial ecosystems (UNESCO/WB map, Mejía and House 2002). Generally, the conclusions of the analysis are highly promising as only five of these ecosystems lie below the 12% conservation goal. These include:

- The Sub-tropical dry forest (small leaf scrub)-the only ecosystem with zero representation in the National System of Protected Areas (SINAPH);
- The Dry Forest – with only 4% representation within the SINAPH;
- The submontane Pine Forest – the most common ecosystem in the country, but only 2% under protection;
- Lowland Pine Forest – also with only 2% under protection; and
- Inferior Montane Pine Forest – with only 5% representation in the SINAPH.

The Small Leaf Dry Forest is in particular danger, because it is not represented in the SINAPH and it is found in areas currently experiencing an increase in sugar cane plantations for ethanol production. These factors are decreasing the possibility of achieving the 12% conservation goal (SERNA 2008).

House and Rivas (2008) also conducted a gap analysis of freshwater ecosystems and found that Honduras contains 48 fluvial ecological systems and 488 macro-habitats. This gap analysis incorporated redundancy and resilience criteria as an adaptation measure against climate change uncertainty. The study concluded that Honduras' streams and rivers – lotic systems – are distributed into 11,270 micro-drainages, 53% of which are under protected status or receive conservation support. Of the 48 fluvial ecosystems comprising lotic biodiversity, 14 are not represented in the SINAPH. Additionally, Honduras has 345 lakes, lagoons, and ponds – lentic biodiversity – classified into seven ecological systems using size, elevation, geological origin, and connectivity as surrogates for ecological processes (TNC 2008). Among these, the conservation gap analysis recommended that Honduras should focus on conserving 34 lentic systems, of which 19 are within the SINAPH (Annex 6), located in the Río Aguán and Patuca lowlands, as well as in the only highland pond, the Chiligatoro.

Marine ecosystems should always be managed after careful analysis of the impacts from and inter-connectedness with terrestrial systems, especially coastal watersheds and wetlands. Mangroves, seagrass beds, coral reefs, estuaries/lagoons, and even sandy beaches are almost always biologically and/or physically linked in some fashion. Spawning aggregation and nursery sites for fish and nesting sites for birds, turtles, and the

saltwater crocodile are of critical importance for conservation. For these reasons, a networked system of MPAs is essential, and is best achieved within a framework of integrated coastal management that ensures the preservation of the physical, chemical, and biological processes of a well functioning coastal/marine landscape and seascape.

The Meso-American Reef is an ecosystem of concern; this is the second longest barrier reef in the world and the longest in the Latin America. The reef is listed as one of the top ten coral reef “hotspots” in the world due to its uniqueness and threats. Because of its significance, the heads of states of Honduras, Mexico, Belize and Guatemala signed the Tulum Declaration for the Protection of the Meso-American Reef. The four countries renewed their commitment two years ago and endorsed a regional action plan. Over 2 million people depend upon the health of the Meso-American Reef for their livelihoods and well-being.

### 3.4. CULTURAL DIVERSITY

Honduras is a multicultural and multilingual country with seven ethnic families:

- Spanish-speaking *ladinos* (almost 5 million people)
- English-speaking *criollos*
- Afro-Antilleans or Garífunas and four indigenous families (8% of the total population)
- Mayan descendents, known as *Los Chorti*
- Macro Chibcha divided into the *Misquitos*, the *Pech*, the *Tawahkas*, and the *Lencas*
- Uto Azteca group, known as the *Nahua*, and
- Hokan-Sioux group, known as the *Tolupan*.

These groups constitute Honduras’ cultural biodiversity (House and Midence 2007). Ladinos and criollos have settled mainly in the central part of the country, and the remaining five ethnic family populations are located in the eastern, western, and coastal areas (see map in Annex 7).

Although much information exists about these ethnic groups, it is not well incorporated into national policy and land-use management planning. The indigenous groups consider conservation an important tool to preserve their sacred sites and to manage sustainable natural resource use. Additionally, they are interested in managing protected areas and surrounding buffer zones. House and Midence (2007) provide sufficient information to use indigenous knowledge in the management of natural resources and thus to “to rescue, exchange, stimulate and support their traditions.” Carlos García from SERNA’s Biodiversity Directorate (DiBio) indicated that after multiple conversations with Misquito groups, DiBio concluded that greater efforts must be made to implement biodiversity conservation within productive landscapes. This is viewed as an important alternative that may promote conservation in areas of indigenous populations with productive activities.

### 3.5. GENETIC DIVERSITY

Genetic diversity is preserved if conservation program design takes into account maintenance of population sizes, redundancy, and connectivity. Honduras does not have information regarding the viability of natural biodiversity populations or ecological integrity of the country’s ecological systems. This dearth of information hampers development of programs that could develop economically viable and environmentally sound income-generating activities outside of the current species used in agriculture and animal husbandry.



# 4. MANAGEMENT AND MONITORING

## 4.1. MANAGEMENT, DESIGN, AND PRIORITIZATION

In Honduras, biodiversity is managed and conserved through the National Protected Areas System (SINAPH). The SINAPH comprises 14 management categories and has grown since 2002 from 1,200,000 hectares (ha) of terrestrial protected areas (Bustillo 2002) to the current 1,875,745 ha, with a total of 72 areas. Fifty-one of the protected areas have been legally established, while the remaining 21 are waiting for legal designations to be completed, as shown in Table 2. It is important to highlight that 100% of terrestrial protected areas are located in mountainous ecosystems, and two of the declared areas refer to Lake Yojoa and the Ticamaya Lagoon. Twelve marine-protected areas are located in the Caribbean, while the remaining areas are in the Gulf of Fonseca on the Pacific.

**Table 2. Distribution of Protected Areas Between Terrestrial and Marine Systems Declared and Proposed (SERNA 2008)**

Description	Declared Protected Areas (63)				Proposed Protected Areas (35)				Total Protected Areas (98)			
	No	%	Area (ha)	%	No	%	Area (ha)	%	No	%	Area (ha)	%
Terrestrial	51	81	1366805.296	56	21	60	508940.07	64	72	73	1875745.364	58
Marine-coastal	12	19	1054976.909	44	14	40	284614.52	36	26	27	1339591.429	42
TOTAL	63		2421782.205		35		793554.59		98		3215336.793	

\*Note: The list of protected areas declared and proposed is in Annex 8.

As a result of limited human and financial resources, the government of Honduras has prioritized protected areas based on presence of endemic and endangered species and ecosystem vulnerability. This list of 38 priority areas (AFE/COHDEFOR 2006, Annex 9) includes 59 of the 62 ecosystems found in Honduras (SERNA 2008). Areas that are co-managed by an NGO or that receive support from the international donor community (USAID, UNDP, GEF, WB, among others) have approved protected areas management plans in place. These areas include the Biósfera de Río Plátano, Reserva de Biósfera Tawahka, Parque Nacional Patuca, Reserva Biológica El Chile, Reserva Biológica Güisayote, Refugio de Vida Silvestre Cuero y Salado, Parque Jeannette Kawas, Refugio de Vida Silvestre Texiguat, and Islas de la Bahía (Portillo 2007). Additionally, two RAMSAR sites have been declared since 2002 – the 7,394 ha Laguna de Bacalar (February 2, 2003), located in Gracias a Dios, and the 43,640 ha Lake Yojoa sub-watershed (June 5, 2005), located in Comayagua, Cortés, and Santa Bárbara. The other four RAMSAR sites in Honduras are the Barras de Cuero Salado (1993), Jeannette Kawas National Park (1995), Punta Izopo Wildlife Refuge (1996), and the wetland system located in the southern area of Honduras in the drainage of the Gulf of Fonseca (1999) (RAMSAR List July 2008).

One of the most important advances in biodiversity conservation in Honduras has been the re-orientation of its approach to ecosystem-based management. Starting in 2002, and with the support of several international NGOs and the donor community (TNC, WWF, GTZ, UNDP), Honduras undertook a number of studies to analyze the composition of terrestrial and freshwater ecological *systems*, their relative coverage area throughout the country; their representation within the SINAPH; and how much of the pre-established goal (12%) is outside the SINAPH (the gap analysis). As a result of these analyses, Honduras established the goal of 12% minimum area needed under protection to maintain ecological integrity. The ecosystem portion of the gap analysis has been concluded (House and Rivas 2008), while the administrative and financial analyses are still

underway. Once all three gap analyses are completed, Honduras will have the information needed to decide on: 1) adding/dropping PAs; 2) defining the size and shape of current and new PAs; 3) redefining management categories; 4) strengthening connectivity between PAs; 5) defining areas and uses for biological corridors at the landscape level, using best practices for such areas; 6) adapting and strengthening the current monitoring system to better measure ecological integrity; and 7) establishing an information platform that is an approximation of a baseline for future national-level evaluations. It should be noted that as of June 2009 TNC is currently assisting the GOH to identify gaps with respect to marine conservation in the Gulf of Fonseca, having completed the eco-regional assessment for the SAM in January 2008.

## 4.2. MONITORING

Monitoring programs respond to the need to respond to and manage changes that are detected and interpreted as outside of acceptance limits. Given that ecosystems are in a constant state of change and are affected by exogenous factors, monitoring programs that readily provide insight to whether conservation actions and land-use practices are having the expected effects on biodiversity is key to a well-managed PA system. Monitoring is a continuous and systematic gathering of data following strict protocols that permit interpretation with the minimum possible variance related to the implemented method. A functioning monitoring program assumes that a baseline exists, that *triggering limits* exist, and that human resources are in place both to gather field or photographic and/or satellite data and interpret information. Concurrently, there must be a mechanism that supports the response to an *information trigger* that then sets corrective action into place.

In Honduras, the **Environmental Indicator System**, which monitors protected areas and evaluates administrative effectiveness, includes a few indicators of protected area “health.” Additionally, other activities, such as specific research projects, biological inventories, and gap analyses, also provide information on protected areas, but they tend to provide species-specific information and do not address ecosystems or entire protected areas.

Although Honduras has implemented a biological monitoring program in a number of protected areas, no systematic information is available to assess the occurrence of species population health or decline. The monitoring program, implemented by AFE-COHDEFOR in 2003–2005, has been discontinued and has not received much support to restart (SERNA 2008). This program was a first attempt at systematically monitoring biodiversity elements, particularly species. The results generated from this three-year effort are stored as Excel databases and ArcView information platforms, with as many as 5,000 data points distributed among 20 protected areas. Complementing the biological monitoring program is an ecological integrity monitoring system (DAPVS-AFE-COHDEFOR 2007), which proposes to monitor 25 of the 38 priority protected areas, but it has not been implemented to date.

# 5. ECOSYSTEM SERVICES, ECOTOURISM AND FORESTRY

## 5.1. ECOSYSTEM SERVICES

Ecosystem services are as varied as the capacity to assign an economic value to the resources encompassed in natural areas. The National Strategy for Environmental Goods and Services (Mejía et al. 2007), currently under discussion, is based on a 2021 goal that states Honduras will implement a national system of “*goods and services...that defines and regulates compensation mechanisms at the local, municipal, supra-municipal and national levels, permitting a strong acceptance and participation of civil society, private and public sectors, guaranteeing its sustainability and evolution.*” Within the government and the NGO community, support is strong to implement this environmental services system to help support conservation efforts. Other strategies and policies also call for environmental services, including the following:

- National Poverty Reduction Strategy, which promotes the payment of environmental services as mechanisms to protect water resources;
- National Environment Policy (2005), which encourages the establishment of norms to promote the sustainability of environmental services payments;
- National Biodiversity Strategy (2001), which establishes a framework to develop an inventory of natural resources as “the goods and services” of protected areas to generate funds for the conservation of biological diversity;
- National Forestry Program (2008), which includes in its 2014 goals the valuing of environmental services in 39 priority protected areas and 440 micro-watersheds; and
- The new Forestry, Wildlife and Biodiversity Law (2007), which recognizes payments for environmental services and establishes a mechanism for payment through the Forest and Protected Areas Funds.

The issue of environmental services has gained momentum over the past six years; but experiences are still nascent and mostly focused on water resources as the principal service emanating from forests. Other services such as carbon sequestration, oxygen generation, and ecotourism still need to be explored. In the Río Plátano Biosphere Reserve, the Mesoamerican Biological Corridor program conducted an economic valuation of the reserve’s resources (Barzev 2002) and found sufficient goods and services in the reserve to generate enough income to pay for its administration, pay taxes to the government (local and national), and establish a fund for conservation efforts. To take full advantage of environmental services, administrative and market mechanisms must be established and local and national government entities must be strengthened to administer and manage the mechanisms in a transparent manner.

## 5.2. ECOTOURISM

Ecotourism is a key biodiversity economic value activity that can and should generate significant revenues at local, regional, and national levels. The 2002 Protected Areas Rationalization Assessment notes that Honduras has great potential to develop a successful ecotourism industry because of its great variety of ecosystems, including tropical forests, cloud forests, wetlands along the coasts, rivers suitable for canoeing and bird watching, nesting turtle beaches, archaeological sites, coral reefs, and caves. Although these natural opportunities exist, they need to be better marketed as ecosystems in their pristine state, and Honduras needs to improve its green image with the international community.

In 2004, Honduras developed a National Ecotourism Strategy that defines clear steps to developing ecotourism that incorporate tour operators, PA administrators, international cooperation projects, NGOs, community associations, businesses (all necessary services such as hotels, restaurants, and transport), municipalities, and local communities. Today, ecotourism is a widely accepted concept, and a large ecotourism cottage industry has developed, albeit somewhat haphazardly, over the last decade. A variety of supporting activities are being led by international donor agencies to strengthen ecotourism development. The Mesoamerican Coral Reef Project (SAM) has manuals for park guards (2004), nature interpretation (2005), and small and micro-business management (2005). The Honduran Ecological Network for Sustainable Development (REHDES), with the support of various donors, supports local ecotourism enterprises and a program for bilingual naturalist guides. The European Union supports SERNA in its effort to consolidate Atlantic-Emerald ecotourism and protected areas corridor (PROCORREDOR) consolidation. The PROCORREDOR project is planning to finance a training and ecological interpretation center. USAID/Honduras, through its MIRA Project, has provided technical assistance, training, and financial support to North Coast protected areas and ecotourism enterprises since 2005, and has supported various initiatives to increase community-level participation in ecotourism. Nevertheless, much remains to be done in the way of infrastructure improvement and capacity development to make ecotourism in Honduras rise to internationally accepted standards and to make Honduras an attractive destination to enjoy nature.

## 5.3. FORESTRY: STATUS OF TROPICAL FORESTS

Of the 112,492 km<sup>2</sup> of Honduras' territorial extension, 9,800,000 ha (87%) are classified as forestry lands (Plan Forestal 1996). Currently, only 5,700,000 ha (51%) are under forest cover (SAG/AFE/COHDEFOR/FAO 2006). The 2005–2006 National Forest and Tree Inventory found Honduran forests comprise 3,500,000 ha (60%) broadleaf forests, 1,600,000 ha (29.4%) coniferous forests, 536,601 ha (9.3%) mixed forests, and 47,682 ha (1%) mangrove forests. Land use outside the forest areas includes cattle ranching (9.2%), agriculture-annual crops (9.1%), natural shrubs and grasslands (8.7%), agroforestry systems (4.9%), and wetlands (3.8%).

Historically, more than 90% of commercial forestry has taken place in pine forests. In 2006, permitted extraction totaled 852,200 m<sup>3</sup> of pine and 20,900 m<sup>3</sup> of broadleaf species. It is estimated that 80,000 to 100,000 ha of forest are lost annually due to the expansion of agriculture, forest fires, and illegal logging, especially in broadleaf forests, representing approximately 4,100,000 ha. The coniferous forests, although affected less by deforestation, have suffered a reduction in productivity and genetic quality, mainly as a result of fires, disease, and inadequate selective felling.

During the 10-year period of 1997–2007, AFE/COHDEFOR statistics show an average of 1,717 fires annually, affecting an average area of 50,000 ha/year (AFE/COHDEFOR 2007). Additionally, forest pests have affected an average area of 6,234 ha/year, which is equivalent to 233,763 m<sup>3</sup>/of wood per year (AFE/COHDEFOR 2007).

During the period of 1993–2007, AFE/COHDEFOR authorized 1,285 Forest Management Plans, of which 57% were on public, 11% on municipal, and 32% on private lands, totaling an area of 1,256,632 ha or

2,672,513 m<sup>3</sup> of wood. In the last five years, the rate of reforestation has diminished, although in 2007, 2,100,000 trees were planted and 136 forestry nurseries were established with a production capacity of 8,200,000 trees. By 2003, 4,762,510 ha (42% of the national territory) had qualified as *Kyoto Areas*, as per Kyoto Protocol criteria and the Morocco Agreement's forestation and deforestation definitions (Honduras Frente al Cambio Climático, FAO, 2003).

## 5.4. FORESTRY AS AN ECONOMIC SYSTEM

Historically, forestry activities in the country have contributed to the growth of the economy through the production and export of whole logs, sawn wood, furniture, poles, fishing rods, resin and its derivatives, and forest seed. In 2004, the forestry sector contributed 9.8% (US\$54 million in exports) to the gross national product (GNP) representing 42.4% of the total agricultural contribution to the GNP. By 2006, the sector's economic contribution rose to 9.9% of the GNP, ranking forestry the fourth most important economic activity (AFE/COHDEFOR 2007).

The 2002–2025 vision, articulated in the National Forestry Policy, views the sector's contribution to economic development as follows:

*Forest resources and their biodiversity are conserved and managed efficiently, increasing production and productivity of goods and services, increasing forest cover, recuperating deforested areas and generating benefits through the three main basic functions of forests: economic, social and environmental/ecological, significantly contributing to socioeconomic development of all Honduran people and specifically supporting poverty reduction.*

Over the past 10 years (1997–2007), the forestry sector has generated 67,787 direct jobs on average and approximately a similar quantity of indirect jobs per year (AFE/COHDEFOR 2007). The figures are even higher when firewood collection and distribution are added. Honduras has also established a Social Forestry System (SFS) with 197 registered farmer organizations, although not all of them were active by 2007. With the state modernization and decentralization movement, more responsibilities were transferred to local governments where the opportunities to further consolidate the SFS exist within a more sustainable and integral development framework.

Statistics indicate that the full potential of the available forest is not being exploited. Current data show that pine forests can provide 1,800,000 m<sup>3</sup>/year and mixed forests 360,000 m<sup>3</sup>/year. However, experts involved in forestry extraction indicate that actual values are much smaller, which indicates the urgency for better forest inventories, particularly of broadleaf forests, to better define the national potential.

A series of factors contributes to improving sustainable harvesting and development of the forestry economic system. These include Honduras' close proximity to the U.S. market, which provides a comparative advantage over producers in South America and other regions; the existence and abundance of both pine and broadleaf species and precious woods of high quality for furniture and other products; the potential for increasing production in a sustainable manner; and the availability of forestry experts (1,250) and experienced technicians.

Additionally, Honduras has a culture of valuing its forest resources as evidenced by the protected areas system that maintains over 29% of its territory in protected status. This culture of conservation is further supported by private conservation areas and reserves that protect important micro-watersheds.

## 5.5. FORESTRY AND POVERTY REDUCTION

The Honduran Poverty Reduction Strategy (PRS) provides mechanisms to facilitate increased access to production inputs, marketing information, and technical assistance to households below the poverty line to improve income and cash flow to break the cycle of subsistence. The PRS has identified the forestry sector as an economic activity that can support rural populations and has established programs to consolidate the

initiative, including the National Small Agriculture Program, National Decentralization and Local Development Program (PRODEL), National Agro-industry and Agro-export Development Program, National Rural Sustainable Development Program (PRONADERS), National Forestry Program, and National Land Tenure and Access to Land Program.

Similarly, the Honduran National Agriculture Policy (2003–2021) establishes three instruments for implementing the policy (SAG 2003): reduction of the rate of deforestation and rural poverty; expansion of investment to increase forestry production, under the concept of sustainable forest use; and incorporation of tourism, environmental services, and other economic uses of the country's forestry resources.

## **5.6. COASTAL/MARINE ECOSYSTEMS: GENERAL DESCRIPTION AND STATUS**

The Caribbean coast of Honduras consists of a narrow coastal plain at the foot of steep watersheds that rise to some of the highest elevations in Central America. It includes the southern end of the world's second longest barrier reef system – the Mesoamerican Reef – that stretches from Mexico, to Belize, Guatemala, and Honduras. Steep watersheds and seasonally abundant rainfall result in powerful hydrology and erosive energy along numerous river systems and smaller drainages. The Caribbean coast includes three groups of islands: the Islas de la Bahía (Bay Islands) and Cayos Cochinos archipelago; the Cayos Miskitos and banks; and the smaller Swan Islands. The latter two island groups and adjacent coasts are isolated and poorly studied. The north coast is part of the Caribbean Large Marine Ecosystem (CLME).

The Bay Islands group comprised of Roatán, Utila, Guanaja, and Cayos Cochinos has some of the best reefs and is central to the country's tourism development. These islands are surrounded by fringing reefs that support important fisheries. The north coast of Roatán enjoys a nearly continuous barrier and fringing reef. In addition to coral reefs, other features of the coastal/marine ecosystem are equally critical to its health and productivity. These include mangroves, wetlands, seagrass beds, and sandy beaches. Marine habitats and resources are linked from ridge-to-reef by freshwater flows to the sea, but also via ocean currents that transport larvae and pollutants.

The country's south coast is comprised of the Gulf of Fonseca, a shallow depression located on the Pacific side of the Central American isthmus. The Gulf is shared by Nicaragua, Honduras, and El Salvador; it is an extensive area that covers approximately 3,200 km<sup>2</sup>. Of the Gulf's 261 km coastline, 185 km are in Honduras. The Gulf is part of the Pacific Central American Large Marine Ecosystem, which extends along the Pacific Coast of Central America, from Cabo Corrientes in Mexico to the vicinity of the equator. Extensive mangrove wetlands line the Gulf of Fonseca. These mangrove wetlands, with its good circulation and tidal flux, has attracted significant development of shrimp pond aquaculture.

An eco-regional assessment of the Mesoamerican Reef System published in early 2008 indicates that there is relatively good information about many of its key ecosystem features and attributes. Many of these have been fairly well inventoried and mapped. They include the following: coral reefs, mangroves/wetlands, fish spawning aggregation sites, estuaries/lagoons, manatee habitat, sandy beaches, crocodile nesting sites, seabird nesting and migratory stopover sites, sea turtle nesting sites, seagrass beds, and common locations for whale shark sightings. The same assessment identifies other resources for which data and information is generally lacking, including: spiny lobster, queen conch, seabird populations, marine mammal populations, and sea turtle foraging areas. An extensive study, "Reefs at Risk in the Caribbean" published in 2004 by the World Resources Institute, identified the status, trends, and major threats to coral reef resources in the region. As of June 2009, the USAID/MIRA project is conducting a nation-wide inventory of wetlands. The same project has also conducted 26 separate inventories of north coast flora and fauna, including efforts on manatees, seabirds, and sea turtles.

The Reefs at Risk analysis (2004) indicated that 34 percent of Honduran coral reefs are threatened by human activity. The key threats identified include over-fishing (threatening 30 percent of reefs); coastal development

(threatening 25 percent of reefs); and sediment-laden runoff (threatening 10 percent of the north coast mainland fringing reef). Marine-based pollution and physical impact to the reefs threaten six percent of the reefs. These and other threats to the coastal/marine biodiversity of Honduras are described in section 8.

# 6. NATIONAL CONTEXT

## 6.1. SOCIAL, ECONOMIC, AND POLITICAL CONTEXT

The administration of President Ricardo Maduro (2002–2005) entered into the Highly Indebted Poor Country (HIPC) Initiative to obtain the necessary resources to finance the Poverty Reduction Strategy (PRS). Although implementation of the strategy was initiated under the Maduro administration, budget limitations prevented its completion. Under the current Zelaya administration (2006–2009), expectations were raised that the PRS would be continued and completed when additional debt reduction was negotiated. However, resolving and mitigating increased public security and crime problems, teachers' strikes for better pay and benefits, and a crisis with public electricity and telecommunications firms have absorbed much of the PRS budget. Lack of attention to poverty issues has generated concern and uneasiness among civil society organizations.

Since the Tropical Forestry and Biodiversity Assessment in 2002, the population in Honduras has grown from 6.8 million in 2003 to 7.5 million people in 2007 (Banco Central de Honduras 2008), with a yearly increase of 2.3–2.5%. According to the Honduran Statistical Institute (INE 2007), 60% of households in rural areas are classified as poor, living on less than US\$2 a day. Although the incidence of poor families is higher in rural areas, urban areas also have high rates of poverty, with an average of 55.4% of urban households classified as poor. In terms of numbers of individuals, 68% or 4 million people in Honduras are poor and unable to earn enough to cover their basic nutritional needs. Of these people, 2.5 million (42.9%) live in extreme poverty, earning less than US\$1 a day (INE 2007). The United Nations Development Programme's 1998 Human Development Report calculated that the urban population in Honduras will reach 7.3 million by the year 2030 – an increase of 4.5 million people living in urban areas. This situation presents the government with major challenges in food security, land-use planning and zoning, and provision of basic services. The recently prepared World Bank Country Environmental Assessment<sup>5</sup> summarizes the situation succinctly as follows:

*...Despite these achievements, state institutions are still fragile and the governance framework is weak. Furthermore, notwithstanding the country's economic and social improvement, almost two-thirds of the population still lives below the poverty line and key structural constraints on growth have still to be addressed. The key development challenges for Honduras are: (a) strengthening governance and improving the effectiveness of the government, and (b) accelerating its recent growth performance and translating growth into poverty reduction.*

Notwithstanding this somewhat bleak scenario, Honduras has made some progress toward more sustainable development and toward the achievement of Millennium Development Goals (see Annex 10). Honduras is considered to be in an acute state of environmental vulnerability, and natural disasters continue to greatly affect the country's economy and development progress. Strategic policy and structural instruments, such as a national risk management system and an environmental policy promoting equitable access and sustainable use of natural resources, are still lacking. The incorporation of environmentally friendly practices into policy and into technological and productive systems should be a priority.



## 6.2. REGULATORY AND INSTITUTIONAL FRAMEWORK SUPPORTING CONSERVATION

### 6.2.1. BIODIVERSITY

The protection and sustainable use of biodiversity are fundamental principles of conservation. To achieve these environmental norms, regulations must provide the enabling environment, and institutions must be capable and have the necessary resources to promote and secure long-term biodiversity conservation. Three institutions are charged with biodiversity conservation in Honduras – the Secretariat of Natural Resources and Environment (SERNA), the National Institute of Conservation and Forests, Protected Areas and Wildlife Development (ICF), and the Secretariat of Agriculture and Cattle Ranching (SAG).

**Secretariat of Natural Resources and Environment:** SERNA was created by Decree No. 218-96 with a broad mandate to develop, coordinate, implement, and evaluate policies for the protection and use of water resources; new and renewable energy sources; generation and transmission of hydroelectric and geothermal energy; mining and the exploration and exploitation of hydrocarbons; and environment, ecosystems, SINAPH, and the protection of flora and fauna, including research services and pollution control and abatement.

#### **National Institute of Conservation and Forests, Protected Areas and Wildlife Development:**

Established in 2008 by Decree No. 98-2007, the ICF is a dependency of the President's Office and has a mandate to implement the National Conservation, Forestry, Protected Areas and Wildlife Biodiversity Policy by establishing programs, projects, and plans. This new institute was created to be technically and administratively independent with its own national budget appropriation. Its structure and functions bring together many disparate activities, roles, and responsibilities under one organization, including these most salient features:

- The forestry sector is now consolidated and independent from the Secretary of Agriculture and Cattle Ranching.
- The new institute includes Forestry, PA, and Wildlife Community Consultative Boards to improve citizen participation and transparency in the management of forest resources in their communities.
- Forestry and reforestation programs will be supported through government-funded incentive programs.
- Implementation of the National Forestry Program is now a legal obligation.
- The Decree establishes the Inalienable Forestry Public Patrimony Catalog as a public registry in which all declared protected areas and public natural forests must be registered.
- The Decree requires maintenance of an updated biodiversity inventory that includes economic, cultural, social, and environmental valuations of biological resources. The inventory must be registered in the Catalog of Inalienable Forestry Public Patrimony.
- The ICF will develop programs, regulations, or projects for biodiversity conservation with an emphasis on species in danger of extinction.
- The Decree defines payment for environmental services and its implementing mechanisms.
- Forestry and conservation investment funds are established.
- A new national system (SINFOR) combining forestry, protected areas, and wildlife management is created to promote applied and scientific forestry research, and to improve methodologies to support

the ICF and the forestry, PAs (including MPAs), and wildlife areas, involving municipalities and other organizations capable of sustaining forestry research.

- The state, through the ICF, will promote and support forest certification as an incentive for sustainable forest management and to guarantee the quality of forest products.
- Ownership of public lands that have been informally appropriated by communities and private landowners will be defined and given legal status, and administration of public forest lands will be strengthened.
- Criminal sanctions are established for poachers and those caught transforming or selling wood from illegal operations. Penalties include up to 15 years in prison.

**Secretariat of Agriculture and Cattle Ranching:** The SAG was created through Decree No. 218-96 to modernize agriculture, cattle ranching, fisheries, aquaculture, poultry farming, apiculture, animal and plant health, agro and animal husbandry technology, irrigation and drainage, distribution and sales of agriculture supplies, agro meteorology, and agriculture credit. Although this secretariat has jurisdiction over all activities related to the use of wildlife and wetlands (e.g., rivers, lakes, marshes, reefs), its founding legislation does not specifically promote sustainable use of natural resources outside of protected areas.

### 6.2.2. FORESTRY

Forest production during the 2002–2008 period has been defined by a series of political and technical instruments that include the Principles and Guidelines of the new Forestry, PA and Wildlife Policy (2002–2015), Estate Policy for Honduran Agriculture (2003–2015), Transformation and Reconstruction Master Plan, Poverty Reduction Strategy, Integrated Strategy for the Development of the Rural Economy, SINAPH Strategic Plan, National Strategy for Biodiversity and its Action Plan, and various standing roundtables. The institutions with jurisdiction over the forestry sector are the same institutions charged with biodiversity conservation – SAG, ICF, and SERNA.

## 6.3. NATIONAL CAPACITIES

Because of its broad biodiversity and unique terrestrial, freshwater, and marine ecological systems, Honduras is party to a number of international biodiversity and natural resources conservation conventions: Convention of Biological Diversity (CBD); Climate Change Convention; Convention for the Conservation of Internationally Important Wetlands – RAMSAR; and United Nations Convention to Combat Desertification (UNCCD). As a party to these conventions, Honduras has committed itself to comply with the actions required in each, yet Honduras does not have sufficient human, financial, institutional, and administrative resources to do so. In 2007, SERNA went through a self-evaluation of its ability to meet its commitments in these four international treaties. The evaluation found that the capacity created to implement the agreements was at the individual rather than institutional level. Many specialists leave government with their acquired experience and skills to join the private sector or international organizations, leaving little institutional capability behind in the public sector. Other conclusions drawn from this self-evaluation shed light on the country's lack of capacity to meet its international commitments. These include:

- **Wetlands and coastal/marine management.** Honduras lacks university-level training in limnology and freshwater ecology. Likewise, there is no marine biology training or degree program in the country at the graduate or undergraduate degree level. Government technicians working with wetlands have limited understanding of wetlands ecosystem dynamics and are unable to adequately develop policies and programs to conserve and manage them. There is no mechanism to harmonize contradictory norms or regulations such as promoting agriculture in wetland areas. The Honduran National Environmental Policy completely omits the importance of wetlands.

- **Funding.** Most natural resources and biodiversity fieldwork is funded by the international community, as few national resources are available for conservation.
- **Strategic areas to strengthen.** The SERNA self-evaluation recommended the following as priorities for institutional strengthening:
  - Management of policy and norms
  - Education and awareness
  - Information generation and circulation
  - Program and project management for conservation and sustainable use of natural resources and environment.

# 7. NGO AND DONOR PROGRAMS IN SYNERGY

The participation of the Honduran public is promoted under the framework of protected areas (PA) conservation and oriented toward decisions and economic, social, and environmental benefits derived from the management of these areas. Participation of environmental nongovernmental organizations (NGOs) has been very important in the process of co-managing protected areas, even though some NGOs are administratively and financially weak (AFE/COHDEFOR 2004).

As an instrument of protected areas administration co-management was consolidated under Decree No. 10493, the National Environmental Law. By 2004, there were 26 co-management agreements for 34 PAs. The NGOs with the most experience are mostly found on the Caribbean coast and are part of the Honduran Ecological Network for Sustainable Development (REHDES in Spanish). This network consists of eight NGOs (see box) co-managing 19 terrestrial and marine PAs in northern Honduras, encompassing Cortés, Atlántida, Yoro, Colón and the Bay Islands (19 municipalities and 430 communities).

International cooperation has provided technical assistance and financing to support many of these government initiatives with some positive advances. Nonetheless, with much more to do, donors (including WB, IDB, GTZ, FAO, UNDP, and EU) see the need for consolidating the ICF as the institution to coordinate donor initiatives in rural Honduras.

# 8. THREATS TO BIODIVERSITY MAINTENANCE AND PRODUCTIVITY

## 8.1. THREATS TO BIODIVERSITY

The conservation of biodiversity requires a variety of processes to maintain ecosystem dynamics. When these processes are affected, threats to the stability of the system emerge that result in diminished population sizes, genetic variability, habitat quality, and productivity. The result is a decrease in genetic heterogeneity, which diminishes species' capacities to withstand natural adversities and to find alternative spaces for survival. Additionally, when habitat conditions change some populations are benefited over others, which changes community structure. The impacts of these modifications are interpreted as adjustments that may reduce local species' richness or biodiversity. Depending on how widespread the causes and effects are, species populations will gradually be eliminated from the landscape, resulting in species extinction and decreased system productivity. In other words, the goods and services that the ecological system is able to provide are significantly simplified. Simplified systems have fewer options to respond to change and are more vulnerable to natural events and climate change.

Decreased “connectivity,” or habitat fragmentation, and desertification processes are threats that accelerate ecosystem degradation and can result in the introduction of a different set of species. Table 3 presents the principal causes of biodiversity loss and ecosystem degradation in Honduras.

**Table 3. Threats to Biodiversity in Honduras**

Threats	Causes
<ul style="list-style-type: none"> <li>• Forest cover elimination or degradation</li> <li>• Deforestation</li> <li>• Advancing agriculture frontier</li> <li>• Firewood extraction</li> <li>• Forest fires</li> <li>• Illegal wood extraction</li> </ul>	<ul style="list-style-type: none"> <li>• Conversion of forest lands to subsistence agriculture</li> <li>• Shifting hillside agriculture</li> <li>• Poor-quality agricultural lands acquired for cattle grazing, limiting opportunities for natural forest</li> <li>• Cloud forests and areas adjacent to PAs converted to coffee plantations</li> <li>• Lack of political will to provide necessary financial support for COHDEFOR to fully comply with its mandate</li> <li>• Lack of alternative cooking fuels -65% of domestic energy comes from firewood; 75% of Honduras' population uses firewood for domestic needs, with an annual consumption of 1.7 m3. Tegucigalpa, San Pedro Sula, and Choluteca are the urban areas with the most consumption of firewood. About 15% of consumption is for the bread, ceramic, and salt industries, among others.</li> <li>• 3000 forest fires annually affecting 1,000,000 ha, initiated by fire lighters (56%), accidents (25.5%), cattle ranchers (11.5%), and farmers (7%)</li> <li>• Illegal forestry operations -Approximately 75–85% of broadleaf forest wood and 30–50% of pine forest wood</li> <li>• are illegally harvested</li> <li>• Poor forest management – Some natural coniferous forests are showing the effects of genetic homogeneity (reduced vigor and health)</li> </ul>
<ul style="list-style-type: none"> <li>• Shrimp cultivation</li> </ul>	<ul style="list-style-type: none"> <li>• Mangroves are under the administration of the Secretariat of Tourism, which has been authorizing mangrove transformation into shrimp farms</li> </ul>

Threats	Causes
<ul style="list-style-type: none"> <li>• Poaching of wildlife species</li> </ul>	<ul style="list-style-type: none"> <li>• Wildlife sold openly in the streets and exported to other countries. Culturally, families have pets that come from forests (e.g., parrots, felines, orchids, bromeliads). People buy specimens because it is felt they come from "open" biodiversity, i.e. not from Protected Areas</li> <li>• Extraction of freshwater specimens (e.g., fish, mollusks, crabs) using explosives and pesticides</li> </ul>
<ul style="list-style-type: none"> <li>• Increased production of biofuels (African palm, sugar cane)</li> </ul>	<ul style="list-style-type: none"> <li>• Promotion of monocultures contributes to isolating forest fragments through large continuous cultivated areas and is aggravated by the use of agrochemicals contaminating water and soil resources</li> </ul>
<ul style="list-style-type: none"> <li>• Massive use of pesticides and synthetic fertilizers</li> <li>• Disposal of untreated wastewater into natural systems</li> <li>• Disposal of solid waste into natural systems</li> </ul>	<ul style="list-style-type: none"> <li>• Degradation of natural resources as a result of pollution and continued clearing of land, including wetlands, for agriculture and other uses. Lack of environmental enforcement capacity</li> <li>• Lack of infrastructure for treating wastewater discharges and managing solid waste. Many municipalities lack sanitary landfills</li> </ul>
<ul style="list-style-type: none"> <li>• Declining fish stocks due to overfishing, destructive fishing and illegal fishing</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of infrastructure for controlling land drainage and managing its erosive effects through the use of constructed wetlands, retention ponds, and measures that incorporate environmental design</li> <li>• Over-fishing and destructive fishing, including trawling, diving, and small-mesh nets</li> </ul>
<ul style="list-style-type: none"> <li>• Uncontrolled or poorly planned coastal development</li> </ul>	<ul style="list-style-type: none"> <li>• Inadequate coastal land use planning and permitting system and capacity to assess and control cumulative impacts in context of inadequate infrastructure</li> <li>• Absence of watershed management organizations or authority to plan, permit, and control land uses within watersheds; insufficient attention to cumulative impacts from hydropower development, agricultural development, illegal logging, river-bed sand mining, and road construction</li> </ul>
<ul style="list-style-type: none"> <li>• Declining health of coral reefs from overfishing, sedimentation</li> </ul>	<ul style="list-style-type: none"> <li>• Piecemeal degradation of coral reefs from multiple stressors/impacts, including anchor damage, over-fishing of grazers and other species, physical damage from fishing (e.g., trawling, diving), sedimentation, over-enrichment from untreated wastewater discharges, elevated sea surface temperatures</li> </ul>
<ul style="list-style-type: none"> <li>• Global climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Incremental shifts in biological communities as result of elevated temperatures (land and sea), changing precipitation patterns (temporal, spatial, and quantity), ocean acidification, sea-level rise, and increasing frequency and severity of storms</li> </ul>
<ul style="list-style-type: none"> <li>• Invasive species (such as the Pacific lionfish which has rapidly spread throughout the Caribbean after being released in Florida from aquaria)</li> </ul>	<ul style="list-style-type: none"> <li>• Displacement of natural biological communities by invasive species, such as the African palm and tilapia.</li> </ul>

Generally, countries respond to the use of natural resources and to the danger of an increasing rate of biodiversity loss by setting aside a series of fragments of unspoiled ecosystems. Today, it is understood that these areas are only as effective as their size, shape, geographic location, and ecological system configuration within them and that surrounding and internal activities promote conservation. Consequently, the most important mechanism to support biodiversity is the implementation of an adequate protected area design and maintenance system.

Protected areas are viewed as critical to the survival of species and ecosystems. However, to be effective, key questions need to be answered in managing them. What constitutes a protected area? How much protection is enough? How do we resolve use versus protection, maintenance versus recovery, and species versus

ecosystems versus ecological processes? How should the protected area be defined in terms of size, shape, numbers, and location within the landscape, replication, coverage, spacing, connectivity, and corridors? These issues have arisen as a result of lessons learned from island biogeography theory and unsustainable land-use practices. Honduras is attempting to answer some of these issues, beginning with the rationalization of biodiversity use assessment conducted in 2002 (House et al. 2002; Sánchez et al. 2002). The 2008 biodiversity conservation gap analysis (House and Rivas 2008) has provided a number of recommendations to address some of these issues. The gap analysis recommends establishing networks or groupings of protected areas in geographic regions to facilitate re-colonization and recovery of species populations they once contained, as well as to serve as seed sources for the recovery of surrounding landscapes. The challenge in Honduras is framed by the participation of national authorities, park authorities, local communities, local NGO co-managers, and cooperation agencies through the enforcement and compliance of regulations, surveillance, and monitoring.

The root causes of biodiversity threats in Honduras are summarized as follows.

### **Poverty**

- Widespread and extreme poverty. Many of the 68% of Hondurans living in poverty are landless or live in fragile areas not suitable for agriculture and other livelihoods. With few economic opportunities, the poor seek to subsist by using the resources available to them, regardless of protected status. Migratory agriculture, high demand for fuelwood, soil fatigue, erosion, overharvesting of flora and fauna, and contamination pose important threats to biodiversity. Lack of adequate education, agricultural inputs and extension services, health care, and other basic services continue to aggravate the cycle of poverty.
- No economically accessible energy alternatives.

### **Lack of information and understanding of ecosystem dynamics**

- Limited understanding of terrestrial, freshwater, and marine ecosystem functions on the part of responsible authorities. This limitation results in inadequate regulations, weak planning and permitting, inadequate attention to cumulative impacts from development, and weak protected area administration and management.
- Limited understanding of how to implement field-based solutions (i.e., gap analyses and PA management plans). Weak capacity to deal with the different technical design and management needs for marine protected areas (as opposed to terrestrial protected areas).
- General perception that biodiversity conservation takes place only in protected areas. This sends the message that biodiversity can maintain and generate itself only within an area under protection.
- Low environmental awareness. The general population has little environmental awareness, little access to information about the importance of biodiversity, and a high tolerance for poor environmental conditions. There is little common understanding about how “things” work in nature and the linkages with people’s livelihoods. Most people have grown up in stressed environments and have not had the opportunity to appreciate the benefits of better environmental quality (e.g., better health, higher living expectations). Civil society groups are not aware of the issues and are not pressuring the government and advocating for improved biodiversity conservation and environmental management.

### **Inadequate regulatory and policy-enabling environment**

- Lack of and inconsistencies in the regulatory frameworks guiding the management of biodiversity inside and outside of protected areas.
- Biodiversity not part of the national political agenda and dialogue. Biodiversity conservation (and environmental management) is not perceived as directly linked to sustainable economic growth and is not a high national or local priority. Is it not an issue because of a lack of understanding? Or is there a weak effort in increasing understanding because it is not a political issue?

### **Weak institutional capacity and inadequate resources**

- Limited legislation. Land-use management legislation is related to productive sectors such as forestry, agriculture, animal husbandry, water, and fishing. Government entities charged with overseeing land-use management are weak, with few budget resources, so that administrative control and field verification are almost nonexistent.



- Limited municipal-level capacity. Local administration of natural resources is a new responsibility for municipalities that often do not have adequate human and financial capacity to manage them properly. The regulatory framework has many ambiguities resulting in a lack of implementation due to administrative and legal insecurity.
- Weak environmental quality control and field inspection. SERNA's Directorate of Environmental Quality (DECA) focuses its resources on reviewing environmental impact assessments of proposed new activities, with little effort made to monitor implementation of mitigation measures of ongoing development activities. Again, this is due to lack of resources and weak institutional capacity.
- Management responsibility for mangrove forests rests with the Secretariat of Tourism, creating a fundamental disconnect between rational use and conservation and the economic drive to convert these critical resources to other use.
- The authority for marine protected areas rests with ICF. This is primarily a forestry-sector institution that generally lacks any special technical or management experience in the marine sector.
- Weak political will to manage resources sustainably.
- Perverse incentives, such as subsidies for fuel for fishing boats.

## 8.2. FORESTRY SYSTEM CONCERNS

A healthy forestry system depends upon the forest's ability to be self-sustainable and economically viable in the case of forestry plantations. For example, there must be adequate regeneration, seed production, and sufficient heterogeneity in the forest, good silvicultural practices, and protection against forest fires and pests, to be attractive economically. When any of these conditions are absent, the sector becomes vulnerable. The Honduran forestry sector is showing signs of deterioration on both accounts as a result of the lack of understanding of how to manage the sector to make it economically sustainable and with only weak institutions to regulate and guide it. Major threats to forestry in Honduras are presented in Table 4.

**Table 4. Factors Contributing to a Weak Forestry Economy**

Causes of a weak Forestry Economy	
<p><b>Inadequate forest management and land use</b></p> <ul style="list-style-type: none"> <li>• As a result of inadequate management of the pine forest, production has dropped to 1-2 m<sup>3</sup>/ha/year. (Exploitation is considered as a one-time benefit and is often done to pay off a debt. Thus, some of the groups extracting forest resources are not dedicated to the industry.</li> <li>• Agriculture and cattle ranching are priority land uses on lands that are of forestry vocation.</li> <li>• Although approved Forestry Management Plans prescribe specific extraction values oftenthe extraction permit is issued for less than what is approved in the plan rendering the harvest economically unviable. This situation promotes illegal extraction under the umbrella of a permit.</li> <li>• The forestry sector has not be a priority on the national development agenda</li> <li>• Communities have had little access to the economic benefits of forestry</li> <li>• There are only 302 registered agro-forestry groups in the Social Forestry System, representing 8,622 direct and 51,732 indirect beneficiaries, which is equivalent to 3.2% of the population living in forest areas.</li> <li>• Legal and Institutional Constraints</li> </ul>	<p><b>Economic and Funding Barriers</b></p> <ul style="list-style-type: none"> <li>• Administrative processes in the forestry sector lack transparency</li> <li>• The forestry legal framework has some inconsistencies and ambiguities which create insecurity for the private sector</li> <li>• Lengthy administrative processes increase the cost of doing business in this sector.</li> <li>• Short-term policies often go against the longterm sustainability of the sector</li> <li>• The forestry legal framework is difficult to apply</li> <li>• Deficient mechanisms for institutional coordination</li> <li>• Lack of definition regarding land tenure in forest areas There is much speculation about the implementation of the new Forestry, Protected Areas and Wildlife Law</li> <li>• Many in the sector are of the general opinion that nothing will change with the "newly" delimited forestry economic sector</li> <li>• Commercial balance in forestry has a deficit of 88.8 million dollars a year, meaning that Honduras imported more wood and wood products than it exported.</li> <li>• Other goods and services of the forest are unaccounted for.</li> </ul>

	<ul style="list-style-type: none"><li>• Political will is relatively absent in regard to allocating the necessary financial resources to comply with legally assigned institutional responsibilities.</li></ul>
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# 9. ACTIONS NEEDED TO CONSERVE BIODIVERSITY AND IMPROVE FOREST MANAGEMENT

## 9.1. RECOMMENDATIONS TO STRENGTHEN BIODIVERSITY CONSERVATION

This document has highlighted a number of issues as priorities or as opportunities to stimulate a biodiversity initiative. This section provides recommendations and conclusions drawn from this 118/119 analysis. The suggested actions are designed to address the root causes identified threats to the forestry sector and biodiversity conservation. They are meant to inform the design of USAID/Honduras’ new five-year country development strategy, and are categorized into three areas: strengthening of institutional capacities (Table 5), strengthening the conservation role of protected areas (Table 6), and promoting economic alternatives (Table 7)

**Table 5. Strengthen national-level organizational and administrative capacities to improve management and conservation of biodiversity and forestry resources**

Objective: Strengthen National-level Organizational and Administrative Capacities to Improve Management and Conservation of Biodiversity and Forestry Resources Effectively			
Specific Objective	Problem Addressed	Nr.	Actions Needed
1. Build national-level technical and administrative capacities to provide adequate regulatory oversight and management supervision	Honduras is rapidly and systematically losing its biodiversity and forestry as a result of (a) insufficient institutional capacity; (b) lack of management plans and adequate implementation, weak community participation in management decisions; (c) lack of land-use planning implementation; and (d) lack of significant ecosystem monitoring	1	Hold informational seminars and workshops for ICF, SERNA, and other national-level agencies to present the details of and explain roles and responsibilities under the new Forestry, Pas and Wildlife law (Decree 98-2007). Compare environmental legislation defining SERNA mandates with Decree 98-2007. Identify ambiguities, contradictions, or duplication. Identify actions that promote resolving these issues through agreements or other legal instruments.
		2	Support SERNA to analyze the legal framework supporting biodiversity conservation (inside and outside PAs, protection, and sustainable use). Develop and help implement initiatives that contribute to closing any gaps in Honduran legislation.
		3	Identify needed regulatory instruments that will guarantee the implementation of Decree 98-2007. Develop and support implementation of norms, regulations, proceedings, etc. Engage donor community to support implementation of regulatory instruments.

Objective: Strengthen National-level Organizational and Administrative Capacities to Improve Management and Conservation of Biodiversity and Forestry Resources Effectively			
Specific Objective	Problem Addressed	Nr.	Actions Needed
		4	Support administrative strengthening of the ICF to ensure effective implementation of Decree 98-2007 and other related regulatory instruments.
		5	Revise co-management agreements to harmonize with the stipulations in Decree 98-2007. Ensure the incorporation of baseline diagnosis and information for future evaluation of management effectiveness and PAs' ecological integrity. Promote donor coordination for baseline diagnosis support and ecological integrity measurements.
		6	Support the revision of PA design using physical, administrative and financial gap analyses, and complete work on legalization and field delimitations of PAs.
		7	Revise and analyze monitoring programs (biological and ecological integrity), and help establish a practical functioning monitoring system that involves local groups, communities and local governments as well as national entities. Define and establish triggering mechanisms from the monitoring data that will permit adaptive management of PAs.
2. Build local technical and administrative capacities to improve biodiversity conservation and natural resources management	Honduras is rapidly and systematically losing its biodiversity (including forests and fisheries) due to lack of municipality leadership, as these issues are not part of the municipal agenda, and because Municipal Environmental Units lack expertise and resources	8	Help institutionalize professional training and skills-building programs within SERNA, ICF, and other national-level institutions
		9	Hold informational seminars and workshops for municipalities and local organizations to present the details of and explain roles and responsibilities under the new Forestry, PAs and Wildlife law (Decree 98-2007). Identify decentralization mandates and support municipalities to gain technical experience and resources necessary to implement the local mandates of the new decree.
		10	Provide TA to municipal governments (UMAs) to strengthen their capacity for land-use planning, zoning, construction codes, EIA regulations, participatory planning, and infrastructure development that is designed and located within an analysis of GCC scenarios and impacts.
		11	Identify and support implementation of civil society coordination and advocacy mechanisms that can support coherent community needs
		12	Work with local governments (municipalities or mancomunidades) to stimulate the development of ecotourism development plans, signs for local historical and ecological landmarks, and improved solid and wastewater management particularly in areas affecting PAs. Support municipal land-use planning committees to promote adequate tourism infrastructure and services development. Consider the possibility of developing visitor centers as local government responsibilities.

Objective: Strengthen National-level Organizational and Administrative Capacities to Improve Management and Conservation of Biodiversity and Forestry Resources Effectively

Specific Objective	Problem Addressed	Nr.	Actions Needed
		13	Work with local governments (municipalities or mancomunidades in ecotourism circuits/routes) to establish and/or support the “Comité Municipal de Desarrollo Turístico” particularly to stimulate 1) the elaboration of an ecotourism development municipal strategy; 2) tourism “señalización”, 3) control of solid and liquid waste particularly in areas affecting PAs. In addition, create opportunities to support the “Unidades Técnicas de Ordenamiento Territorial” where the UMAs and tourism units (UTMs) are or should be located, to promote an adequate management of their cultural and natural resources, business services, sleeping places, camping areas, parking, guide and interpretation services, among others. Consider the possibility of developing visitor centers as local government responsibilities.
		14	Provide support to DIGEPESCA to revise, with public input, the Fisheries Law, and to adopt and socialize its contents to
			put into effect. Assist to develop specific regulations to make it useful. Examine the JICA supported ‘master plan for the north coast artisanal fishery’ to understand its scope and intent. Identify synergistic opportunity to enhance its utility and appropriateness.
		15	Request the USAID/ECAM regional program to focus on assisting DIGEPESCA with an institutional capacity development plan. Undertake this in concert with an examination of relevant policies/laws/regulations in the fisheries sector, and the need to assist the sector in Honduras to move towards a rights-based and market-driven approach to reform.
		16	Provide TA to ICF to enhance its capacity for MPA assessment, planning, and management. Consider use of the SUCCESS LWA Program’s “Certification of MPA Professionals” training and certification program, for rangers, site managers, and decision-makers.
		17	Provide TA to all relevant government agencies to assist them to incorporate GCC Vulnerability and Adaptation analyses in their respective sectoral plans and programs. Undertake the development of a USAID/Honduras global climate change country assistance strategy.
		18	Support national and sub-national dialogue towards integrated coastal management. Provide TA and other support to municipal governments, and especially their UMAs responsible for the analysis of cumulative impacts as part of their ongoing planning and permitting functions.



**Table 6. Strengthening the Conservation Role of Protected Areas.**

Objective: Support processes that mitigate and decrease pressures on integrity of ecological systems in PAs and adjacent territories while contributing to the solution of community economic needs.			
Specific objective	Problem Addressed	Nr	Actions Needed
1. Increase PAs' social, economic, environmental, and cultural values	Honduras is rapidly and systematically losing its biodiversity (including forests) because communities have little awareness and knowledge of the economic and environmental value of the biodiversity and natural resources in their surroundings. They are also accustomed to living with degraded and polluted resources and environmental conditions.	19	Continue and accelerate programs that provide opportunities for communities to participate in PA management, and develop alternative and environmentally sound income generation. Continue supporting sustainable tourism initiatives for national and international visitors with improved PA infrastructure publication of informational materials on flora, fauna and other PA features, promote tourism market development. and encourage contracting of local residents as nature guides and support staff for tourism services.
			Support ongoing and enhanced efforts at public education and outreach on environmental issues. Consider support for a "Coastal Environmental Awards Scheme."
2. Decrease the pressures on the natural systems' ecological integrity	Honduras is rapidly and systematically losing its biodiversity (including forests) due to unsustainable and illegal resource extraction from protected and other natural areas, as a means of subsistence.	20	Scale-up and accelerate agroforestry plantations that include fuel wood crops, and short cycle and permanent crops. Organize agroforestry producers and help identify markets and buyers for their products. Provide business development services to agroforestry producers.
		21	Continue to support micro-watershed management planning and other local land-use management instruments to strengthen municipal land use management (ordenamiento territorial) and quality control. Support municipal initiatives that may serve as pilot projects (UMAs, UTMs, and Unidad Técnica de Ordenamiento Territorial Municipal).
	Honduras is rapidly and systematically losing its biodiversity (including forests) as a result of inappropriate and unsustainable land-use and weak environmental quality control and field verification.	22	Promote and support field implementation of ecological integrity monitoring. This will require training to increase technical field skills, data management, and interpretation. Most importantly, once data gathering is ongoing, develop a "triggering" mechanism to respond to findings from the data collected.
		23	Assess and identify options for sustainable financing of conservation and resource management activities. Focus on the development of incentives to more fully engage the private sector and individuals as stewards of their resources.
	24	Provide TA and other assistance (including public participation) on the development of a "State of the Coast Report". This will serve as a 'report card' against which the status and trends of key resources will be measured in future years. The methodology, scientific validity, and institutional location of this activity are all important factors in its success.	

**Table 7. Reform Existing Extractive Businesses and Strengthen Economic Alternatives**

Objective: Support the development of alternative goods and services as mechanisms for economic development, sustainable use of natural resources, and adaptation for climate change.			
Specific objective	Problem Addressed	Nr.	Actions Needed
1. Support activities and mechanisms that contribute to adaptation and mitigation of the effects of climate change	Honduras is rapidly and systematically its biodiversity (including forests) as a result of limited knowledge of biodiversity values and ecosystem services.	25	Explore and develop additional payment for environmental services mechanisms for conserving natural cover for CO2 capture, producing clean water, voluntary conservation opportunities (i.e. private conservation), and decreased vulnerability to natural disasters. Develop and implement monitoring and certification mechanisms to verify environmental commitments.
		26	Work with municipalities, water boards, and/or mancomunidades to integrate management of aquatic biological resources into natural resources and watershed management programs.
		27	Assess the possibility of using sustainable tourism certifications as a means to attract more tourists to Honduras.
		28	Incorporate land-use zoning using environmental goods and services criteria in natural resource management plans. Land-use zoning should be used as the basis for developing payments for environmental services. In areas where environmental services markets have potential, develop marketing strategies and alliances.
		29	Assist the IHT to identify, assess, and develop options and best practices for appropriate tourism development, including bird watching, nature guiding, kayaking, rafting, diving, and possibly catch-and-release recreational fishing.

## 9.2. IMMEDIATE NEEDS FOR THE DEVELOPMENT OF THE FORESTRY SECTOR

Transformation and modernization of the legal and institutional framework should offer new perspectives for the development of forestry with participation by private enterprise, local governments, and communities. This change can reduce present threats to forest resources. Actions that deserve attention given the establishment of the new National Institute of Conservation and Forests, Protected Areas and Wildlife Development (ICF) include the following:

1. Require management plans for forestry production and PAs
2. Implement procedures for preparing management plans
3. Establish criteria for environmental impact studies in forest management, PAs, and wildlife use
4. Develop and implement national criteria and indicators for sustainable land use management
5. Decentralize responsibilities for integrated environmental management, private forest management, and strengthening of municipal environmental units.
6. Revise the Social Forestry System strategy



7. Implement the National Forest Health Strategy (2004)
8. Implement the National Fire Management Strategy (2008)
9. Revise and implement the Strategic Development Plan for the SINAPH
10. Implement the National Environmental Goods and Services Strategy (2006)
11. Implement the Sustainable Financial Plan for the SINAPH (AFE 2003)
12. Implement the National Forestry Program (2004)
13. Implement the National Ecotourism Strategy (2004).

### **9.3. IMMEDIATE NEEDS FOR THE REFORM OF THE FISHERY SECTOR**

Transformation and modernization of the legal and institutional framework should offer new perspectives for the sustainable use of fishery resources with participation by private enterprise, local governments, and communities. This change can reduce present threats to fishery resources. Actions that deserve attention given the development of a new fishery law include the following:

- Require management plans for fishery use and an ecosystem-based network of MPAs.
- Implement procedures for preparing management plans.
- Establish criteria for environmental impact studies in fishery management, PAs, and wildlife use.
- Develop and implement national criteria and indicators for marine spatial planning and marine resource use.
- Decentralize responsibilities for integrated environmental management, fishery management, and strengthening of municipal environmental units.
- Implement the commitments under the Tulum Declaration and the SAM regional plan.
- Build capacity to address Illegal, Unregulated and Unreported (IUU) Fishing, as Honduras committed to under the recent FAO agreement on Port State Measures.
- Promote secured access to fishing areas, permitting and licensing and the use of quotas.

### **9.4. ESTABLISHING GEOGRAPHIC PRIORITIES**

It is important to identify and establish the areas where resource management programs can be successful and have an impact in solving the problems identified in this report. In identifying such areas, it is recommended that the following criteria be taken into consideration:

1. Geographic distribution of donors' programs (e.g., very high on the North Coast and Bay Islands)
2. Geographic distribution of financial support (e.g., very high in Atlántida)
3. Concentration of indigenous groups (as shown in Annex 7)
4. Terrestrial ecological system vulnerability (gaps): (a) the *Arbustal Microfoliado Submontano o Bosque Seco Subtropical* is the only ecosystem with no SINAPH representation; (b) the *Bosque Seco – Dry Forest* has only 4% protected; (c) the *Bosque de Pino Submontano*, the most common ecosystem in the country, has only 2% is protected; (d) the *Bosque de Pino de Bajura* has only 2% protected, and (e) the *Bosque de Pino Montano Inferior* has only 5% of its natural cover protected (Annex 6).

5. Freshwater ecological system vulnerability (gaps) (Annex 6).
6. Endemic species' presence (Annex 11)
7. Areas with population in extreme poverty (e.g., northwestern Honduras).

Databases with information on all of these variables are available and can be used together for decision making on the selection of priority conservation areas. For example an area that combines micro-watersheds, lentic systems, endemic species, vulnerable terrestrial ecosystems (gaps), a heterogeneous human population (e.g. various indigenous groups and criollos or ladinos), and the support of local NGOs would be a strong candidate region to for rapid results.

# 10. USAID PROPOSED STRATEGY AND PROGRAM

## 10.1. EXTENT TO WHICH PROPOSED ACTIONS MEET NEEDS

USAID/Honduras initiated support to the environment, economic growth, and CAFTA in 2004. The main actions taken can be divided into two time periods (2004–2006 and 2006–2009) and their effect on biodiversity conservation and tropical forest management can be interpreted differently. The focus during the first phase of the MIRA Project was to strengthen management and increase the use of protected areas (PA) through training, creating better facilities, and increasing information availability, including the following:

- Twenty-six research studies on flora and fauna (2005–2007);
- Training of PA co-managers in strategic planning and finances, management plans, and funding access (2006–2007);
- Support in four PAs (National Park Pico Bonito, Wildlife Reserve Cuero y Salado, Botanical Garden Lancetilla, and National Park Jeannette Kawas) through the development of trail interpretation and restoration, information materials about species in each PA, elaboration of Lancetilla’s management plan, and training of 57 participants from local communities as naturalist guides (2006–2008). The impact of these activities has shown to increase visitation to these areas by as much as 500%;
- Support to 100 landowners in PA buffer areas on secondary forest use and agroforestry production, accomplished with Green Wood and the Fundación Hondurena de Investigación Agrícola (FHIA) to take advantage of marketing opportunities and thus maintain the economic benefits of the land;
- Support for the development of regulatory instruments, such as 1) SINAPH regulations, 2) technical and administrative norms manual for PA Management, 3) technical and administrative norms manual for wildlife management, 4) wetlands policy, 5) wetlands inventory, 6) third country report for the Convention for Biodiversity for SERNA, 7) development of the national strategic plan for CITES;
- Increase of support from 4 to 10 PAs concentrated in the northern coastal area, including the Bay Islands, Garifuna tourism route, Cayos Cochinos, and La Ceiba.

The direct effects of these actions increased PA visitation, which in turn provided an economic benefit for the managing entities (government and/or co-managers) and contributed to public environmental sensitivity.

The second phase of USAID support is concentrating on developing the biodiversity and forest component of CAFTA. The activities are mainly directed towards community economic development through strengthening of land-use capacities, production, and economic improvement of families living in PA buffer areas. This approach provides opportunities for synergy with cooperating groups (i.e., Green Wood and FHIA) that consolidate marketing and technical “know-how” to exploit all uses of the available resource (e.g., use of small diameter trees and other secondary forest species). The short-term effects of these actions can help decrease communities’ use of natural resources from adjacent PAs, thus decreasing biodiversity extraction as families meet their everyday needs from local providers. It is, however, understood that some needs, such as energy from firewood, will probably still be met through extraction of nearby standing forest cover.

The ability of local residents living in or near PAs to appreciate the benefits of standing forest cover (e.g., source of water, lower temperatures, lower disaster impacts, diminished pest abundance, and source of seed,

32 TROPICAL FORESTRY AND BIODIVERSITY (FAA 118 AND 119) ANALYSES among others) will only be realized when they have improved their well-being. Once hunger, education, and health needs are met, people can better appreciate and act on other values of life, i.e. biodiversity and forest cover. Support to the PAs that increases visitation also strengthens nearby communities' appreciation of the value of the area.

USAID has supported several initiatives to promote ecotourism and other income-generating activities in communities near and in protected areas. Specifically, it has supported organic floriculture in Piliwi at Parque Nacional El Tigre near Tegucigalpa and at Paseo Cangrejal in National Park Pico Bonito, as well as restoration of handicraft facilities and a rustic restaurant. Children and youngsters, known as Guaruna, have been trained in photography, computers, and guiding techniques. In the area around Refugio de Vida Silvestre Cuero y Salado, a group of women (Mujeres Artesanas de Salado Barra) was trained in handicrafts and cooking; in addition, USAID has supported trail interpretation, development of information materials, and restoration of a visitors' center.

## **10.2. OPPORTUNITIES FOR LINKAGES WITH PROPOSED ACTIVITIES**

The general opinion among staff and other donors interviewed is that the activities developed during the second phase of MIRA will have immediate beneficial effects on local biodiversity conservation. Considering the high percentage of the poor who live on public lands, economic development must be complemented with community strengthening through the provision of alternative natural resources use. It is a slow process that must integrate environmental, social, and economic factors to bring about economic development that is in harmony with biodiversity conservation. Involving both women and men from representative ethnic groups will maximize economic resources and reduce costs. Because the proposed actions in MIRA/CAFTA are concentrated in rural areas adjacent to PAs, it is even more important to create synergy with FHIA for technical support, local NGOs, and other cooperation agencies to increase local execution capacity, and interested private groups (e.g., coops, associations, produce buyers) to maximize economic returns.

As a follow-up to CAFTA-DR activities on the north coast focused on reforming the spiny lobster fishery, since June 2009 the USAID-funded Global FISH has been initiating stakeholder participation processes in Honduras and Nicaragua. The Alliance is building upon longstanding presence in the fishing communities by a major private sector seafood purchaser from the U.S. (Darden Restaurants based in Orlanda, FL) and their efforts represent an excellent opportunity to achieve meaningful reform of the economically and ecologically important spiny lobster fishery. Reform of this fishery can only be accomplished at the transboundary scale and additional resources and leverage with the GOH in talks will be necessary. USAID/Honduras can make a pivotal contribution to this effort, while helping national and sub-national authorities to build their capacities in fisheries management and sector reform. Spiny lobster fill an important ecological niche and help to maintain the healthy functioning of coral reef ecosystems.

## **10.3. POTENTIAL THREATS OF PROPOSED ACTIVITIES**

The PAs in many instances have become islands in a deforested landscape. Thus, buffer areas adjacent to the PAs that still have some forest cover, albeit degraded (i.e., secondary), are extremely important for the ecological integrity of a PA. Working with local communities in buffer areas has to be done with extreme care to prevent further fracturing of ecosystems and landscapes. Whenever possible, buffer areas should be managed with multiple species plantations for firewood and other uses to support an increase in the adjacent PA's forest cover.

Working in PAs to increase their capacity to maintain resources through sustainable income-generating activities probably is as indispensable as working directly with the communities and residents to strengthen their socioeconomic well being. However, supporting families in these areas can only work in the long term if

the economic status and social web of the area slowly increases and strengthens. Decreases in production or in demand, as well as decreases in PA visitation, are threats that could lead to renewed PA exploitation activities. Thus, sustainability mechanisms must be a part of project activities to increase the number of families participating in economic development activities; identify and secure responsible buyers and markets through the creation of alliances with private enterprises; and develop additional opportunities for improving community and individual quality of life.

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# ANNEX I. BIOGRAPHICAL SKETCHES OF TEAM MEMBERS

## **Pia Paaby Hansen**

Pia Paaby Hansen has worked for numerous conservation initiatives. Her work in the public sector introduced her to the planning process through which tasks are phased with institutional and environmental quality priorities. Consequently, she is familiar with laws, norms, and regulations related to pollution prevention and control, as well as to the access and sustainable use of natural resources of the Central American region.

To develop in the area of conservation planning, Paaby Hansen strengthened the communication skills needed to successfully develop and to effectively integrate her expertise into training sessions. She has written several frequently cited publications in the field.

## **Ernesto Florez**

Ernesto Florez' work has been related to planning initiatives to develop Central American forestry, aimed at strengthening the local and institutional framework of decentralization and environmental management. He has developed appraisals of participatory projects for communities, municipalities, and state institutions. He also has experience in protected areas and in structuring private conservation in Honduras and Mesoamerica through the generation of conservation policies and project management.

# ANNEX . PERSONS CONTACTED

No.	Person Contacted	Institution	Contact Information
1	Ana Patricia Martínez	MIRA project	Tel: 232 2231; <a href="mailto:amartinez@mirahonduras.org">amartinez@mirahonduras.org</a>
2	Orlando Sierra	MIRA project	Tel: 232 2231; <a href="mailto:osierra@mirahonduras.org">osierra@mirahonduras.org</a>
	José Herrero	MIRA project	Tel: 99467994; <a href="mailto:jherrero@miraproject.org">jherrero@miraproject.org</a>
	Juan Carlos Méndez	IRG-MIRA project	<a href="mailto:jmendez@irgtd.com">jmendez@irgtd.com</a> ; <a href="mailto:jcmendez@gmail.com">jcmendez@gmail.com</a>
3	Todd Hamner	USAID/HN	Tel: 236 9320; <a href="mailto:thamner@usaid.gov">thamner@usaid.gov</a>
4	Peter Hearne	USAID/HN	Tel: 236 9320; <a href="mailto:phearne@usaid.gov">phearne@usaid.gov</a>
6	Emilie Weitnauer	IDB	Tel: 221 6152; <a href="mailto:emeliew@iadb.org">emeliew@iadb.org</a>
7	Dante Mossi	WB	<a href="mailto:dmoosireyes@worldbank.org">dmoosireyes@worldbank.org</a>
8	Victor Archaga	TNC	<a href="mailto:varchaga@tnc.org">varchaga@tnc.org</a>
9	Fausto Lazo	GTZ	Tel: 238 1906; <a href="mailto:fausto.lazo@gtz.de">fausto.lazo@gtz.de</a>
10	Carlos García	SERNA/DiBio	Tel: 2359292
11	Mirna Ramos	Areas Protegidas / AFE-COHDEFOR	Tel: 2233248; 2234346
12	Andre Fache	UE	Tel: 235 9424; <a href="mailto:andre.fache@ec.europa.eu">andre.fache@ec.europa.eu</a>
13	Antonio Perera	PNUD	Tel:

# ANNEX 3. SPECIAL CONCERN SPECIES (ESPECIES DE PREOCUPACIÓN ESPECIAL (LISTA 2002))

This information has been adapted from Portillo (2007). Additional information on threats has been included in the 2005 update (AFE-COHDEFOR, DAPVS) and classified into three categories:

- I. Endemics,
- II. Appendix I species of CITES, and
- III. Species with reduced populations.

## Marine and Freshwater Fish, Main threats identified:

1. Habitat destruction: Loss of habitat because of infrastructure construction and landscape modification.
2. Environmental pollution: Degradation of basins (sediments, industrial and agricultural contamination)
3. Overuse: Decrease in populations because of intensive fishing in limited areas of two freshwater species (Lago de Yojoa y Ríos del Oriente) on the EPE and tourism pressures (although not evaluated).

Common Name in Honduras	Scientific Name	EPE category			Threats
		I	II	III	
Tiburón Ballena del Caribe	<i>Rhynchodon typus</i>		X		1,2,3
Cuyamel	<i>Joturus pichardi</i>				1,2,3
Tepemechín	<i>Agonostomus monticola</i>			X	1,2,3

Note: The Cuyamel has been included because of its importance among ethnic communities in the Honduran Mosquitia. Additionally, this species is culturally valued among the Pech, Tawahkas, and Misquitos as an indicator of ecosystem health and the future of their ethnic group (Suazo 2004).

### Amphibians, Main threats identified:

1. Habitat destruction: Loss of vegetation cover, landscape modification by human and natural causes.
2. Illegal hunting: Specimens extracted for export or national use as mascots.
3. Elimination by humans: Some species are considered detrimental to human health.

Common Name in Honduras	Scientific Name	EPE category			Threats
		I	II	III	
Cecilias	<i>Gymnopsis syntremus</i>			X	
Salamandra	<i>Bolitoglossa carri</i>	X		X	1
Salamandra de Celaque	<i>Bolitoglossa celaque</i>			X	1
Salamandra	<i>Bolitoglossa conanti</i>			X	1
Salamandra	<i>Bolitoglossa decora</i>	X		X	1
Salamandra	<i>Bolitoglossa diaphora</i>	X		X	1
Salamandra	<i>Bolitoglossa dofleni</i>			X	1
Salamandra	<i>Bolitoglossa dunni</i>	X		X	1
Salamandra	<i>Bolitoglossa longissima</i>	X		X	1
Salamandra	<i>Bolitoglossa occidentalis</i>			X	1
Salamandra	<i>Bolitoglossa porrasorum</i>	X		X	1
Salamandra	<i>Bolitoglossa striatula</i>			X	1
Salamandra	<i>Bolitoglossa synoria</i>	X		X	1
Salamandra	<i>Nototriton barbouri</i>	X		X	1
Salamandra	<i>Nototriton lignicola</i>	X		X	1
Salamandra	<i>Nototriton limnospectator</i>	X		X	1
Salamandra	<i>Nototriton nasalis</i>	X		X	1
Salamandra de Santa Bárbara	<i>Dendrotriton sanctibarbarus</i>	X		X	1
Salamandra	<i>Oedipina elongata</i>			X	1
Salamandra	<i>Oedipina gephyra</i>	X		X	1
Salamandra de Fuego	<i>Oedipina ígnea</i>			X	1
Salamandra	<i>Oedipina stuarti</i>	X		X	1
Rana de Ojos Rojos	<i>Agalychnis callidryas</i>			X	
Rana de Ojos Rojos	<i>Agalychnis moreletii</i>			X	1
Rana de Ojos Rojos	<i>Agalychnis saltator</i>			X	1
Sapito	<i>Atelophryniscus chrysophorus</i>	X		X	1
Sapito	<i>Bufo campbelli</i>	X		X	1
Sapito	<i>Bufo leucomyos</i>	X		X	1
Rana	<i>Cochranella granulosa</i>			X	1
Rana	<i>Duellmanohyla salvavida</i>	X		X	1
Rana	<i>Duellmanohyla soralia</i>			X	1
Sapito	<i>Eleutherodactylus anciano</i>	X		X	1

Common Name in Honduras	Scientific Name	EPE category			Threats
		I	II	III	
Sapito	<i>Eleutherodactylus aurilegulus</i>	X		X	1
Sapito	<i>Eleutherodactylus chac</i>			X	1
Sapito	<i>Eleutherodactylus coffeus</i>	X		X	1
Sapito	<i>Eleutherodactylus cryzosebetes</i>	X		X	1
Sapito	<i>Eleutherodactylus cruzi</i>	X		X	1
Sapito	<i>Eleutherodactylus fecundus</i>			X	1
Sapito	<i>Eleutherodactylus epochthidius</i>			X	1
Sapito	<i>Eleutherodactylus lauraster</i>	X		X	1
Sapito del Merendón	<i>Eleutherodactylus merendonensis</i>	X		X	1
Sapito	<i>Eleutherodactyles milesi</i>	X		X	1
Sapito	<i>Eleutherodactylus minimus</i>			X	1
Sapito	<i>Eleutherodactylus noblei</i>			X	1
Sapito	<i>Eleutherodactylus olanchano</i>	X		X	1
Sapito	<i>Eleutherodactylus operosus</i>	X		X	1
Sapito	<i>Eleutherodactylus pechorum</i>	X		X	1
Sapito	<i>Eleutherodactylus rostralis</i>			X	1
Sapito	<i>Eleutherodactylus omoaensis</i>	X		X	1
Rana	<i>Hyalinobatrachium pulveratum</i>			X	1
Rana	<i>Hyalinobatrachium cardiacalyptum</i>	X		X	1
Rana	<i>Hyalinobatrachium crybetes</i>	X		X	1
Rana de las Bromelias	<i>Hyla bromeliacia</i>			X	1
Rana Catracha	<i>Hyla catracha</i>			X	1
Rana	<i>Hyla ebraccata</i>			X	1
Rana	<i>Hyla insolitus</i>	X		X	1
Rana	<i>Hyla salvaje</i>	X		X	1
Sapito	<i>Hypopachus barberi</i>			X	1
Sapito	<i>Leptodactylus silvanimbus</i>	X		X	1
Rana	<i>Plectrohyla chrysopleura</i>	X		X	1
Rana	<i>Plectrohyla dasypus</i>	X		X	1
Rana	<i>Plectrohyla exquisita</i>			X	1
Rana	<i>Plectrohyla guatemalensis</i>			X	1
Rana	<i>Plectrohyla hartwegi</i>			X	1
Rana	<i>Plectrohyla hypomykter</i>			X	1
Rana	<i>Plectrohyla matudai</i>			X	1
Rana	<i>Plectrohyla merazi</i>			X	1
Rana	<i>Plectrohyla psiloderma</i>			X	1

Common Name in Honduras	Scientific Name	EPE category			Threats
		I	II	III	
Rana con Espuelas	<i>Ptychohyala spinipollex</i>	X		X	1
Rana	<i>Rana maculata</i>			X	1
Rana	<i>Rana warszewitschi</i>			X	1
Rana	<i>Rhinophrynus dorsalis</i>			X	1
Rana Huesuda	<i>Tripurion petasatus</i>			X	1

### Reptiles, Main threats identified:

1. Habitat destruction: Loss of vegetation cover, landscape modification by human and natural causes.
2. Illegal hunting: Specimens extracted for export or national use as mascots.
3. Elimination by humans: Some species are considered detrimental to human health.

Common Name in Honduras	Scientific Name	EPE category			Threats
		I	II	III	
Cocodrilo Americano	<i>Crocodylus acutus</i>		X	X	1,2,3
Tortuga Caguama	<i>Caretta caretta</i>		X	X	1,2
Tortuga Negra	<i>Chelonia agassizi</i>			X	1,2
Tortuga Verde	<i>Chelonia mydas</i>		X	X	1,2
Tortuga Carey	<i>Eretmochelys imbricata</i>		X	X	1,2
Tortuga Golfina, Lora	<i>Lepidochelys olivacea</i>		X	X	1,2
Tortuga Baúla	<i>Dermochelys coriacea</i>			X	1,2
Tortuga de Río	<i>Chelydra serpentina</i>			X	1,2
Tortuga Tres Quillas	<i>Staurotypus triporcatus</i>			X	1,2
Tortuga de Río	<i>Dermatemys mawii</i>			X	1,2
Tortuga Sambunango	<i>Kinosternon scorpioides</i>			X	1,2
Tortuga	<i>Rhinoclemmys annulata</i>			X	1,2
Tortuga	<i>Rhinoclemmys areolata</i>			X	1,2
Tortuga	<i>Rhinoclemmys funerea</i>			X	1,2
Serpiente de Pestaña	<i>Agkistrodon bilineatus</i>			X	1,2,3
Culebra	<i>Amastridium veliferum</i>			X	1,2,3
Boa Rosada/ Islas de la Bahía	<i>Boa constrictor</i>			X	1,2,3
Culebra	<i>Botriechis bicolor</i>			X	1,2,3
Culebra	<i>Botriechis marchi</i>	X		X	1,2,3
Culebra	<i>Coniophanes niceivittis</i>			X	1,2,3
Culebra	<i>Dipsas bicolor</i>			X	1,2,3
Culebra	<i>Enulius bifoveatus</i>	X		X	1,2,3
Culebra	<i>Enulius roatanensis</i>	X		X	1,2,3

Common Name in Honduras	Scientific Name	EPE category			Threats
		I	II	III	
Culebra	<i>Geophis damiani</i>	X		X	1,2,3
Culebra	<i>Geophis fulvoguttatus</i>			X	1,2,3
Culebra	<i>Geophis hoffmanni</i>			X	1,2,3
Culebra	<i>Hydromorphus concolor</i>			X	1,2,3
Culebra	<i>Leptodymus pulcherrimus</i>			X	1,2,3
Culebra	<i>Leptophis modestus</i>			X	1,2,3
Culebra	<i>Leptophis nebulosus</i>			X	1,2,3
Pitón Verde	<i>Loxocemus bicolor</i>			X	1,2,3
Culebra Coral	<i>Micrurus alleni</i>			X	1,2,3
Culebra Coral de Roatán	<i>Micrurus ruatanus</i>	X		X	1,2,3
Culebra	<i>Ninia diademata</i>			X	1,2,3
Culebra	<i>Ninia espinali</i>			X	1,2,3
Culebra Bejuquilla	<i>Oxybelis brevirostris</i>			X	1,2,3
Culebra Bejuquilla	<i>Oxybelis wilsoni</i>	X		X	1,2,3
Culebra	<i>Rhadinaea godmani</i>			X	1,2,3
Culebra	<i>Rhadinaea kinkelini</i>			X	1,2,3
Culebra de Montecristo	<i>Rhadinaea montecristi</i>			X	1,2,3
Culebra	<i>Rhadinaea tolpanorum</i>	X		X	1,2,3
Culebra	<i>Scolecophis atrocinctus</i>			X	1,2,3
Culebra	<i>Sibon anthracops</i>			X	1,2,3
Culebra	<i>Sibon carri</i>			X	1,2,3
Culebra de Lempira	<i>Tantilla lempira</i>	X		X	1,2,3
Culebra	<i>Tantilla tritaeniata</i>	X		X	1,2,3
Culebra	<i>Thamnophis fulvus</i>			X	1,2,3
Culebra	<i>Thamnophis marcianus</i>			X	1,2,3
Culebra	<i>Thamnophis proximus</i>			X	1,2,3
Culebra	<i>Trimorphodon biscutatus</i>			X	1,2,3
Culebra	<i>Sibon fischeri</i>			X	1,2,3
Culebra	<i>Typhlops costaricensis</i>			X	1,2,3
Culebra	<i>Ungaliophis continentalis</i>			X	1,2,3

### Birds, Main threats identified:

1. Habitat destruction: Loss of vegetation cover, landscape modification by human and natural causes.
2. Illegal hunting: Specimens extracted for export or national use as mascots.
3. iii. Elimination by humans: Some species are considered detrimental to human health, plantations, or domestic species.
4. Hunting for Subsistence: Hunting specimens for human consumption.

Common name	Scientific Name	PEP category			Threats
		I	II	III	
Tinamo Mayor	<i>Tinamus major</i>			X	1,4
Pájaro Bobo Café	<i>Sula leucogaster</i>			X	1
Pájaro Bobo Enmascarado	<i>Sula dactylatra</i>			X	1
Pájaro Bobo Patas Azules	<i>Sula nebouxii</i>			X	1
Pájaro Bobo Patas Rojas	<i>Sula sula</i>			X	1
Pelícano Blanco	<i>Pelecanus erythrorhynchos</i>			X	1
Avetoro Americano	<i>Botaurus lentiginosus</i>			X	1
Avejorro Cabecinegra	<i>Botaurus pinnatus</i>			X	1
Garza Roja	<i>Egretta rufescens</i>			X	1
Garza Panza Roja	<i>Agamia agami</i>			X	1
Garza Tigre Rojizo	<i>Tigrisoma lineatum</i>			X	1
Jabirú	<i>Jabiru mycteria</i>			X	1
Cigüeña	<i>Mycteria americana</i>			X	1
Ibis Blanco	<i>Eudocimus albus</i>			X	1
Garza Espátula Rosada	<i>Ajaia ajaja</i>			X	1
Ibis Verde	<i>Mesembrinibis cayennensis</i>			X	1
Flamingo Rojo	<i>Phoenicopterus ruber</i>			X	1
Chirincoco	<i>Ixobrychus exilis</i>			X	1
Pato Negro	<i>Cairina moschata</i>			X	1,4
Pato Porrón	<i>Aythya valisineria</i>			X	1,4
Pato Cuello Anillado	<i>Aythya collaris</i>			X	1,4
Pato Enmascarado	<i>Nomonyx dominicus</i>			X	1,4
Yaguasa Aliverde, Sarceta Com.	<i>Anas crecca</i>			X	1
Yaguasa Canela	<i>Anas cyanoptera</i>			X	1
Rey Zope	<i>Sarcoramphus papa</i>			X	1
Gavilán Cola de Tijera	<i>Elanoides forficatus</i>			X	1,3
Milano Cabeza Gris	<i>Leptodon cayanensis</i>			X	1
Milano Pico Ganchudo	<i>Chondrohierax uncinatus</i>			X	1



Common name	Scientific Name	PEP category			Threats
		I	II	III	
Milano Caracolero	<i>Rosthamus sociabilis</i>			X	1
Milano Bidentado	<i>Harpagus bidentatus</i>			X	1
Halcón Cola Negra	<i>Ictinia mississippiensis</i>			X	1
Halcón Plomizo	<i>Ictinia plumbea</i>			X	1,3
Gavilán Bicolor	<i>Accipiter bicolor</i>			X	1,3
Gavilán de Cooper	<i>Accipiter cooperi</i>			X	1,3
Gavilán	<i>Accipiter striatus</i>			X	1,3
Gavilán Cola Blanca	<i>Buteo albicaudatus</i>			X	1,3
Gavilán Ratonero	<i>Buteo brachyurus</i>			X	1,3
Gavilán Azacuán	<i>Buteo platypterus</i>			X	1,3
Gavilán	<i>Buteo swainsonii</i>			X	1,3
Gavilán Blanco	<i>Leucopternis albicollis</i>			X	1,3
Busardo Plomizo	<i>Leucopternis semiplumbea</i>			X	1,3
Aguilucho Collar Negro	<i>Busarellus nigricollis</i>			X	1,3
Gavilán Ratonero	<i>Parabuteo unicinctus</i>			X	1,3
Gavilán Cangrejero	<i>Buteogallus anthracinus</i>			X	1,3
Aguilucho Negro	<i>Buteogallus urubitinga</i>			X	1,3
Águila Solitaria	<i>Harpyhaliaetus solitarius</i>			X	1,3
Águila Crestada	<i>Morphnus guianensis</i>			X	1,3
Águila Harpía	<i>Harpia harpyja</i>		X	X	1,3
Aguilucho Blanco-Negro	<i>Spizastur melanoleucus</i>			X	1,3
Aguilucho con Adorno	<i>Spizaetus ornatus</i>			X	1,3
Aguilucho Negro	<i>Spizaetus tyrannus</i>			X	1,3
Gavilán Pantanero	<i>Circus cyaneus</i>			X	1,3
Gavilán Patas Largas	<i>Geranospiza caerulescens</i>			X	1,3
Querque Cuello Rojo	<i>Daptrius americanus</i>			X	1,3
Águila Pescadora	<i>Pandion haliaetus</i>			X	1,3
Gavilán Guaco	<i>Herpetotheres cachinnans</i>			X	1,3
Halcón Barreteado	<i>Micrastur ruficollis</i>			X	1,3
Halcón Collarejo	<i>Micrastur semitorquatus</i>			X	1,3
Halcón Palomero, Merlín	<i>Falco columbarius</i>			X	1,3
Halcón Pecho Anaranjado	<i>Falco deiroleucus</i>			X	1,3
Halcón Aplomado	<i>Falco femoralis</i>			X	1,3
Halcón Peregrino	<i>Falco peregrinus</i>			X	1,3
Halcón Murcielaguero	<i>Falco ruficularis</i>			X	1,3
Halconcito, Lis Lis, Lislisque	<i>Falco sparverius</i>			X	1,3

Common name	Scientific Name	PEP category			Threats
		I	II	III	
Pajuil	<i>Crax rubra</i>		X	X	1,4
Pava de Monte	<i>Penelope purpurascens</i>		X	X	1,4
Chachalaca Negra	<i>Penelopina nigra</i>			X	1,4
Codorniz Orejinegra	<i>Odontophorus melanotis</i>			X	1,4
Codorniz Ocelada	<i>Cyrtonyx ocellatus</i>			X	1,4
Codorniz Cara de Ante	<i>Rhynchortyx cinctus</i>				1,4
Codorniz Cuello Negro	<i>Colinus nigrogularis</i>			X	1,4
Polluela Cuello Blanco	<i>Laterallus albigularis</i>			X	1,4
Polluela Cuello Gris	<i>Laterallus exilis</i>			X	1,4
Polluela Cuello Rojizo	<i>Aramides axilaris</i>			X	1,4
Sora	<i>Porzana carolina</i>			X	1
Chorlito Dorado	<i>Pluvialis dominica</i>			X	1
Falaropo de Wilson	<i>Phalaropus tricolor</i>			X	1
Falaropo Cuello Rojo	<i>Phalaropus lobatus</i>			X	1
Rayador	<i>Rynchops níger</i>			X	1
Pájaro Pata Lobulada	<i>Heliornis fulica</i>			X	1
Pájaro del Sol	<i>Eurypyga helias</i>			X	1
Paloma Escamosa	<i>Columba speciosa</i>			X	1,4
Turquita Pecho Marrón	<i>Claravis mondetoura</i>			X	1,4
Paloma Caribeña	<i>Leptotyla jamaicensis</i>			X	1,4
Guara Verde	<i>Ara ambigua</i>		X	X	1,2,4
Guara Roja	<i>Ara macao</i>		X	X	1,2
Perico Frente Anaranjada	<i>Aratinga canicularis</i>			X	1,2
Perico del Pacífico	<i>Aratinga strenua</i>			X	1,2
Perico Verde	<i>Aratinga holochlora</i>			X	1,2
Perico	<i>Aratinga nana</i>			X	1,2
Perico Rayado	<i>Bolborhynchus lineola</i>			X	1,2
Periquito Barbilla Anaranjada	<i>Brotogeris jugularis</i>			X	1,2
Lora Cabeza Blanca, Monjita	<i>Pionus senilis</i>			X	1,2
Lora Corona Café	<i>Pionopsitta haematotis</i>			X	1,2
Lora Frente Blanca	<i>Amazona albifrons</i>			X	1,2
Lora Nuca Amarilla	<i>Amazona auropalliata</i>			X	1,,2
Lora Frente Roja	<i>Amazona autumnalis</i>			X	1,2
Lora Corona Azul	<i>Amazona farinosa</i>			X	1,2
Lora Corona Amarilla	<i>Amazona ochrocephala</i>			X	1,2
Lora de Roatan	<i>Amazona xantholora</i>			X	1,2

Common name	Scientific Name	PEP category			Threats
		I	II	III	
Cucu, Faisán	<i>Dromococcyx phasianellus</i>			X	1,2
Búho Excavador	<i>Speotyto cunicularia</i>			X	1,4
Búho Vareteado	<i>Rhinoptynx clamator</i>			X	1,4
Búho Crestado	<i>Lophotrix cristata</i>			X	1,4
Búho de Anteojos	<i>Pulsatrix perspicillata</i>			X	1,4
Búho Pigmeo	<i>Glaucidium gnoma</i>			X	1,4
Búho Pigmeo	<i>Glaucidium brasilianum</i>			X	1,4
Búho Pigmeo	<i>Glaucidium griseiceps</i>			X	1,4
Búho Pigmeo	<i>Glaucidium minutissimum</i>			X	1,4
Pucuyo Collar Café	<i>Caprimulgus ridwayi</i>			X	1,4
Pucuyo Cola Manchada	<i>Caprimulgus maculicaudatus</i>			X	1,4
Pájaro Estaca Grande	<i>Nyctibius grandis</i>			X	1
Vencejo Barbilla Blanca	<i>Cypseloides cryptus</i>			X	1
Vencejo Cuello Blanco	<i>Aeronautes saxatalis</i>			X	1
Colibrí Esmeralda Catracho	<i>Amazilia luciae</i>	X		X	1
Colibrí Tijereta Colilargo	<i>Doricha enicura</i>			X	1
Colibrí Coroniblanco	<i>Microchera albocoronata</i>			X	1
Quetzal	<i>Pharomachrus mocinno</i>	X			1
Torobós Cuello Azul	<i>Aspatha gularis</i>			X	1
Torobós	<i>Electron carinatum</i>			X	1
Torobós Pico Ancho	<i>Electron platyrhynchum</i>			X	1
Tucán Pico Rojo	<i>Ramphastos swainsonii</i>			X	1
Tucanillo Oreja Amarilla	<i>Selenidera spectabilis</i>			X	1
Chipe de Mejillas Doradas	<i>Dendroica chrysoparia</i>			X	1
Cheje Alirufó	<i>Piculus simplex</i>			X	1
Hornero Cuello Escamoso Café	<i>Sclerurus guatemalensis</i>			X	1
Hornero Cuello Escamoso Café	<i>Sclerurus mexicanus</i>			X	1
Cabezón Cabeza Gris	<i>Piprites griseiceps</i>			X	1
Papamoscas Alazón Pisqueada	<i>Laniocera rufescens</i>			X	1
Cabezón Canelo	<i>Pachyramphus cinnamomeus</i>			X	1
Jilguero de Montaña	<i>Myadestes obscurus</i>			X	1
Zorzal de Montaña	<i>Turdus plebejus</i>			X	1

Habitat loss is not only affecting migratory birds of Honduras; some resident species are at the brink of extinction. The Harpy Eagle, red caracara, Honduran emerald hummingbird, red guara, green guara, and orange chest falcon have very reduced tolerance ranges in the tropical forest. Of these, the Honduran emerald hummingbird is the most threatened bird in Central America (com. pers., David Anderson).

### Mammals, Main threats identified:

1. Habitat destruction: Loss of vegetation cover, loss of connectivity between natural reserves.
2. Illegal hunting: Species considered a danger or just an opportunity to shoot.
3. Species trafficking: Selling as mascots.
4. Hunting for subsistence: Human consumption.
5. Climate change: Environmental parameters have changed.
6. Natural predators: Natural overpopulations as a result of human disequilibrium.
7. Domestic predators: Cats and dogs.
8. Environmental pollution: Chemical and biological substances.

Common Name	Scientific Name	PEP category			Threats
		I	II	III	
Tacuazín de Agua	<i>Chironectes minimus</i>			X	1
Musaraña	<i>Cryptotis gracilis</i>			X	1,7
Musaraña Hondureña	<i>Cryptotis hondurensis</i>	X		X	1,7
Musaraña Hondureña	<i>Cryptotis nigrescens</i>			X	1,7
Musaraña	<i>Cryptotis parva</i>			X	1,7
Murciélago Blanco	<i>Ectophylla alba</i>			X	1
Mono Aullador, Olingo	<i>Alouatta palliata</i>		X	X	1,2,3
Mono Cara Blanca	<i>Cebus capucinus</i>			X	1,2,3
Mono Araña	<i>Ateles geoffroyi</i>			X	1,2,3,4
Perezoso Tres Dedos	<i>Bradypus variegatus</i>			X	1,2
Perezoso Dos Dedos	<i>Choloepus hoffmani</i>			X	1,2
Oso Caballo	<i>Myrmecophaga tridactyla</i>			X	1,2
Ardilla Voladora	<i>Glaucomys volans</i>			X	1
Tepezcuinte	<i>Agouti paca</i>			X	1,2,4
Guatusa de Roatan	<i>Dasyprocta ruatanica</i>	X		X	7
Delfín Común	<i>Delphinus delphis</i>			X	8
Delfín de Lunares	<i>Stenella attenuata</i>			X	8
Delfín	<i>Stenella clymene</i>			X	8
Delfín Barras Blancas	<i>Stenella coeruleoalba</i>			X	8
Delfín Líneas Blancas	<i>Stenella longirostris</i>			X	8
Delfín	<i>Steno bredanensis</i>			X	8
Delfín Nariz de Botella	<i>Tursiops truncatus</i>			X	8
Ballena de Esperma	<i>Physeter macrocephalus</i>			X	8
Uayúc, Cocomiztle	<i>Bassaricyon gabbii</i>			X	1
Rintel, Gato Cola Anillada	<i>Bassariscus sumichrasti</i>			X	1

Common Name	Scientific Name	PEP category			Threats
		I	II	III	
Lepasil	<i>Eira barbara</i>			X	1,2
Hurón, Grisón	<i>Galictis vittata</i>			X	2
Nutria, Perro de Agua	<i>Lontra longicaudis</i>			X	1,2,
Onza, Comadreja	<i>Mustela frenata</i>			X	1
Tigrillo	<i>Leopardus wiedii nicaraguae</i>				1,2
Tigrillo	<i>Leopardus wiedii salvinia</i>				1,2
Jaguar, Tigre	<i>Panthera onca</i>				1,2
Puma, León	<i>Puma concolor</i>				1,2
Tigrillo, Ocelote	<i>Leopardus pardalis</i>			X	1,2
Manatí, Vaca Marina	<i>Trichechus manatus</i>			X	1,2,4
Danto, Tapir	<i>Tapirus bairdii</i>		X	X	1,2,4
Tilopo, Güisisil	<i>Mazama americana</i>			X	1,2

# ANNEX 4. HIGHLY ENDANGERED AND ENDANGERED TREE SPECIES REPORTED FOR HONDURAS

This information comes from the 2007 IUCN Red List of Threatened Species ([www.iucnredlist.org](http://www.iucnredlist.org)).  
Downloaded on 12 August 2008).

## Highly Endangered Tree Species of Honduras

Id.	Scientific Name	Family	Order
1	<i>Ilex williamsii</i>	Aquifoliaceae	Celastrales
2	<i>Oreopanax lempiranus</i>	Araliaceae	Apiales
3	<i>Viburnum molinae</i>	Caprifoliaceae	Dipsacales
4	<i>Viburnum subpubescens</i>	Caprifoliaceae	Dipsacales
5	<i>Maytenus williamsii</i>	Celastraceae	Celastrales
6	<i>Connarus popenoei</i>	Connaraceae	Rosales
7	<i>Casearia williamsiana</i>	Flacourtiaceae	Violales
8	<i>Molinedendron hondurensense</i>	Hamamelidaceae	Hamamelidales
9	<i>Dalbergia intibucana</i>		
10	<i>Lonchocarpus molinae</i>		
11	<i>Lonchocarpus sanctuarii</i>		
12	<i>Lonchocarpus trifolius</i>		
13	<i>Gentlea molinae</i>	Myrsinaceae	Primulales
14	<i>Eugenia lancetillae</i>	Myrtaceae	Myrtales
15	<i>Forestiera hondurensis</i>		
16	<i>Symplocos molinae</i>	Symplocaceae	Ebenales
17	<i>Ternstroemia landae</i>		
18	<i>Platymiscium albertinae</i>		
19	<i>Tontelea hondurensis</i>	Celastraceae	Celastrales
20	<i>Cordia urticacea</i>	Boraginaceae	Lamiales
21	<i>Pleurothyrium roberto-andinoi</i>	Lauraceae	Laurales
22	<i>Sideroxylon retinerve</i>	Sapotaceae	Ebenales
23	<i>Bauhinia paradisi</i>		

Id.	Scientific Name	Family	Order
24	<i>Chodanthus montecillensis</i>	Bignoniaceae	SCROPHULARIALES
25	<i>Coccoloba cholutecensis</i>	Polygonaceae	Polygonales
26	<i>Coccoloba lindaviana</i>	Polygonaceae	Polygonales
27	<i>Colubrina hondurensis</i>	Rhamnaceae	Rhamnales
28	<i>Decazyx esparzae</i>	Rutaceae	Sapindales
29	<i>Dendropanax hondurensis</i>		
30	<i>Desmopsis dolichopetala</i>	Annonaceae	MAGNOLIALES
31	<i>Eugenia coyolensi</i>	Myrtaceae	MYRTALES
32	<i>Fraxinus hondurensis</i>	Oleaceae	Scrophulariales
33	<i>Gloeospermum boreale</i>	Violaceae	Violales
34	<i>Lonchocarpus phaseolifolius</i>	Leguminosae	Fabales
35	<i>Lonchocarpus yoroensis</i>	Leguminosae	Fabales
36	<i>Mollinedia butleriana</i>	Monimiaceae	Lurales
37	<i>Mollinedia ruae</i>	Monimiaceae	Lurales
38	<i>Quararibea yunckeri</i>	Bombacaceae	Malvales
39	<i>Sloanea shankii</i>		
40	<i>Terua vallicola</i>		
41	<i>Viburnum hondurensis</i>	Caprifoliaceae	Dipsacales
42	<i>Vochysia aurifera</i>	Vochiceaceae	

### Highly endangered tree species of Honduras.

Id.	Scientific Name	Family	Order
1	<i>Roystonea dunlapiana</i>	Palmae	Arecales
2	<i>Blakea brunnea</i>	Melastomataceae	Myrtales
3	<i>Zanthoxylum ferrugineum</i>	Rutaceae	Sapindales
4	<i>Cymbopetalum mayanum</i>	Annonaceae	Magnoliales
5	<i>Lonchocarpus phlebophyllus</i>		
6	<i>Pithecellobium saxosum</i>		
7	<i>Blepharidium guatemalense</i>	Rubiaceae	Rubiales
8	<i>Amphitecna molinae</i>	Bignoniaceae	Scrophulariales
9	<i>Juglans olanchana</i>		
10	<i>Lonchocarpus retiferus</i>		
11	<i>Zanthoxylum gentlei</i>	Rutaceae	Sapindales
12	<i>Ocotea jorge-escobarii</i>	Lauraceae	Lurales
13	<i>Terminalia bucidoides</i>		
14	<i>Guaiacum sanctu</i>	Zygophyllaceae	Sapindales
15	<i>Lacunaria panamensis</i>	Quiinaceae	Theales

Id.	Scientific Name	Family	Order
16	<i>Connarus brachybotryosus</i>	Connaraceae	Rosales
17	<i>Trichilia breviflora</i>		
18	<i>Lonchocarpus miniflorus</i>	Leguminosae	Fabales
19	<i>Eugenia salamensis</i>	Myrtaceae	Myrtales
20	<i>Vitex gaumeri</i>	Verbenaceae	Lamiales
21	<i>Anaxagorea phaeocarpa</i>	Annonaceae	Magnoliales
22	<i>Decatropis paucijuga</i>	Rutaceae	Sapindales
23	<i>Decazyx macrophyllus</i>		
24	<i>Hampea sphaerocarpa</i>	Malvaceae	Malvales
25	<i>Machaerium nicaraguense</i>	Leguminosae	Fabales
26	<i>Neea acuminatissima</i>	Nyctaginaceae	Caryophyllales
27	<i>Ouratea insulae</i>	Ochnaceae	Theales
28	<i>Parathesis vulgata</i>	Myrsinaceae	Primulales
29	<i>Pithecellobium johansenii</i>	Leguminosae	Fabales
30	<i>Pithecellobium stevensonii</i>		
31	<i>Quiina schippii</i>	Quiinaceae	Theales
32	<i>Vitex cooperi</i>	Verbenaceae	Lamiales
33	<i>Vitex kuylenii</i>	Verbenaceae	Lamiales
34	<i>Xolocotzia asperifolia</i>	Verbenaceae	Lamiales
35	<i>Zanthoxylum belizense</i>	Rutaceae	Sapindales
36	<i>Zanthoxylum panamense</i>	Rutaceae	Sapindales
37	<i>Zanthoxylum procerum</i>	Rutaceae	Sapindales
38	<i>Tetrorchidium brevifolium</i>		



# ANNEX 5. LIST OF LAGOONS AND PONDS CHOSEN AS GAPS IN THE HONDURAN CONSERVATION EFFORT

This information comes from House and Rivas (2008). Maps of terrestrial conservation areas are presented below as Figures 1a and 1b, followed by maps of lentic (Figure 2a) and lotic (Figure 2b) proposed areas as a result of a conservation gap analysis.

Ecological System	Name	Size (ha) **	Ecological Drainage Unit (EDU)
Hill, open, sedimentary pond	La Crucita	1,058	Ulúa
	Don Anselmo	6,210	Ulúa
	Carrizal	4,272	Ulúa
Lowland, open, sedimentary pond	La Uva	17,998	Ulúa
Highland, open, sedimentary pond	Chiligatoro	1,651	Ulúa
Lowland, open, sedimentary lagoon	Lama	235,979	Ulúa
Lowland, open, sedimentary pond	El Lirio	167,899	Aguan
	Mafia 1	5,489	Aguan
	Guayaba	127,287	Aguan
	Marimba	285,150	Aguan
Lowland, open, sedimentary lagoon	Gualan	175,098	Aguan
Hill, open, sedimentary pond	Aguas negras	5,750	Choluteca
	Aguas Caliente	1,634	Choluteca
Lowland, open, sedimentary lagoon	Laguntara	2,096,964	Patuca
	Kuhunta	4,812,668	Patuca

\* Every ecological system has been defined by using 4 criteria: **Size**: Pond (< 1 km<sup>2</sup> (100 ha) of water and < 10 m in depth); Lagoon (> 1 km<sup>2</sup> and < 10 m in depth), Lake (> 10 m in depth with any area). **Elevation**: Lowlands (< 300 m snm); Hills (300 – 1000 m snm); Highlands (1000 -2500 m snm). **Origin**: refers to whether the lentic system is the result of volcanic, tectonic, fluvial (sedimentary) origin. **Functioning**: open

or closed refers to whether the lentic system is isolated (endorheic) or open to, for instance, a fluvial system.

\*\* This size includes both the aquatic system as an approximate area of influence (“drainage area”).

With the combined effort of government offices and international NGOs (TNC and WWF) it has been possible to generate an ArcView information database platform useful for designing and planning for (a) protected areas location, (b) protected areas connectivity, (c) research projects, (d) vulnerability analysis, among many others. The data are available for public use through TNC (web).

The following figure 1a show the result obtained from an optimization analysis done using the MARXAN program to identify the best occurrences according to a series of criteria fed into it, basically to accomplish a 100 % of the pre-established conservation goals for the Honduran ecosystems. In blue it shows existing protected areas that contains ecosystems complying with ecological integrity and size criteria, in pink are pre-existing protected areas where their limits should be modified to increase the area, the red polygons are new proposed areas, and the transparent polygons are existing protected areas that possibly are redundant i.e. exceed conservation goal, or do not comply with criteria such as size and/or ecological integrity. The proposed new protected areas to fulfill terrestrial ecosystem goals represent the various under represented ecosystems (House and Rivas 2008).

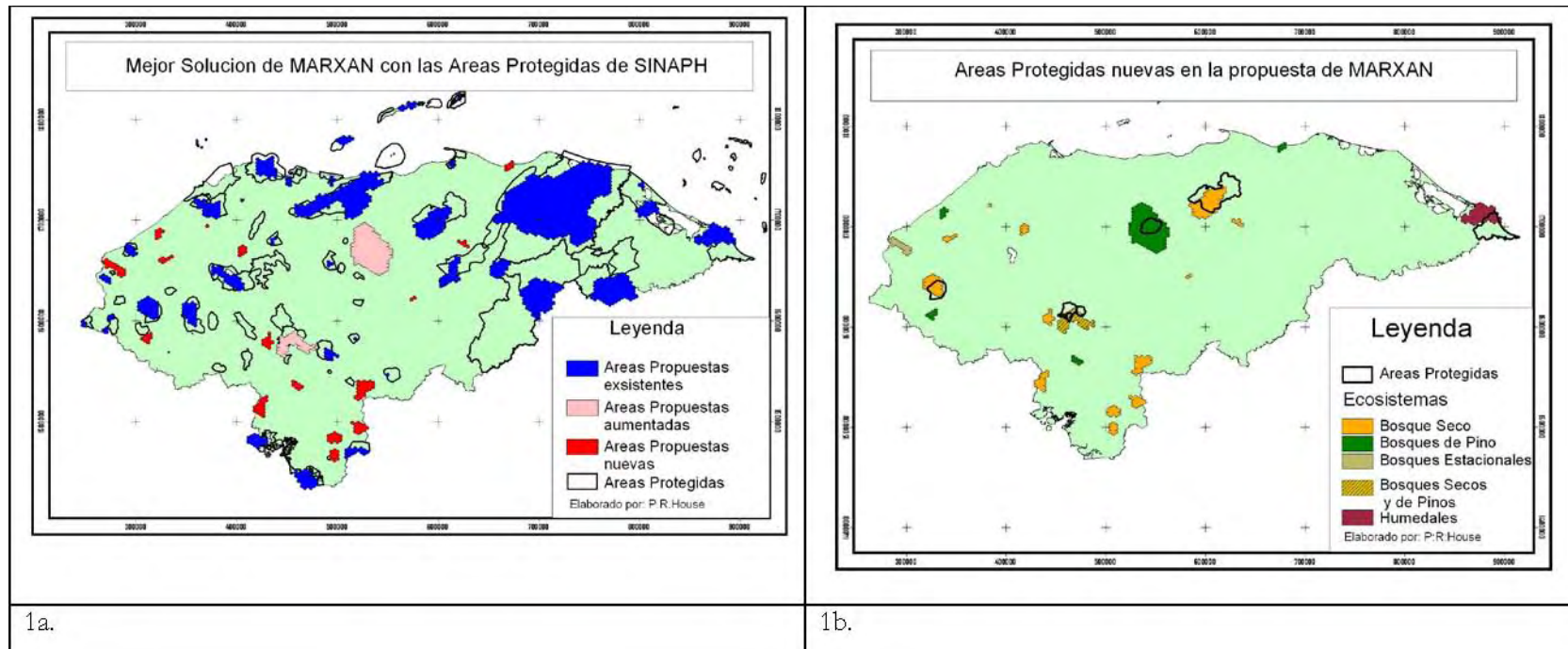
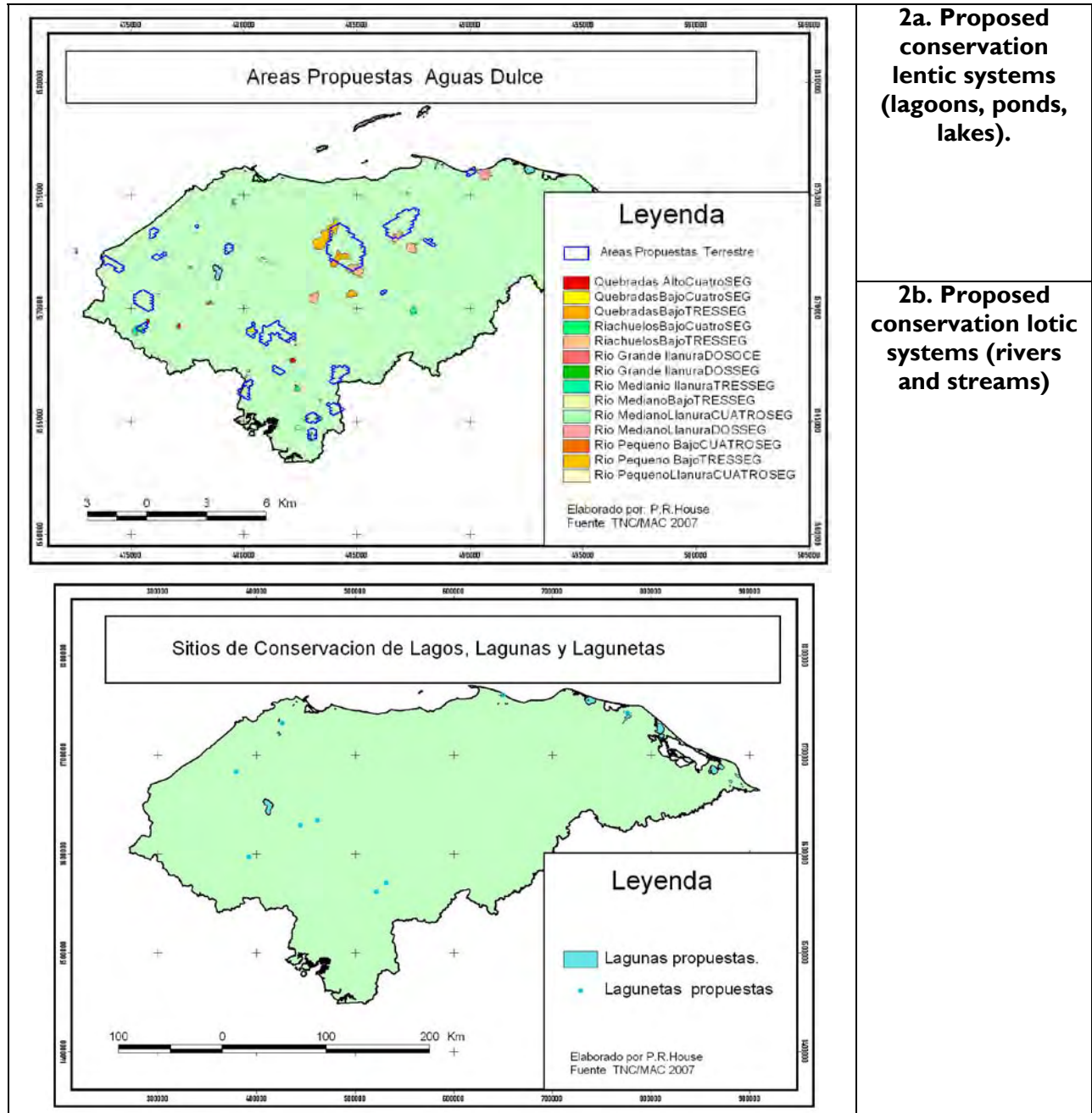
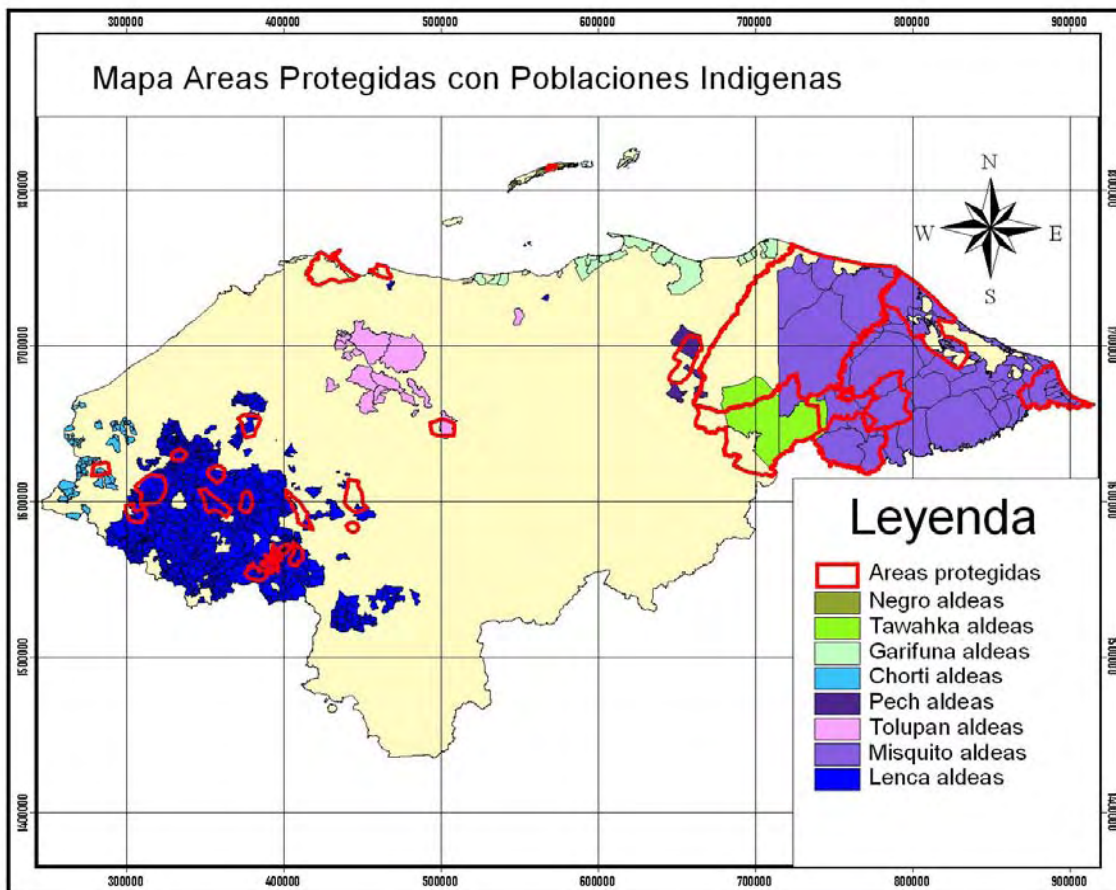


Figure 1.

The largest water bodies still without any conservation efforts are those found at the Mosquitia (i.e. Patuca), located in the proposed protected area Kruta and Caratasca. A re-definition and declaration of these areas would contribute to filling this gap. Another important group of un-protected systems can be found in the Rio Aguan's lowlands; the only north coast river with no protected wetlands. The rest of the proposed systems to be conserved are ponds located near the center of the country, traditionally ignored in conservation efforts. Among these we find the only reported highland pond, Chiligatoro (House and Rivas 2008).



# ANNEX 6. DISTRIBUTION OF INDIGENOUS GROUPS IN HONDURAS



# ANNEX 7. LIST OF DECLARED AND PROPOSED PROTECTED AREAS OF HONDURAS

Id.	Name	Management Category	Official State	Area (ha)	Co-management
1	Cuevas de Taulabé	Monumento Natural			Municipalidad de Taulabe/IHAH
2	Archipiélago del Golfo de Fonseca	Parque Nacional Marino	Declarada	4995,436	CODDEFFAGOLF
3	Bahía de Chismuyo	Área de Manejo Hábitat/Especie	Declarada	316616,005	CODDEFFAGOLF
4	Bahía de San Lorenzo	Área de Manejo Hábitat/Especie	Declarada	15329,118	CODDEFFAGOLF
5	Barras de Cuero y Salado	Refugio de Vida Silvestre	Declarada	13027,004	FUCSA
6	Cayos Cochinos	Monumento Natural Marino	Declarada	48925,225	Fundación Cayos Cochinos
7	Celaque	Parque Nacional	Declarada	26266,790	GTZ-Municipalidad de Gracias
8	Cerro Azul Copán	Parque Nacional	Declarada	12083,102	COPRACAA, FUNBANHCAFE y DIA
9	Cerro Azul Meámbar	Parque Nacional	Declarada	31339,088	Aldea Global
10	Cerro Guanacaure	Área de Uso Múltiple	Declarada	1976,567	CODDEFFAGOLF
11	Cerro Yuuca	Reserva Biológica	Declarada	771,998	EAP
12	Colibrí Esmeralda Hondureño (Arenal)	Área de Manejo Hábitat/Especie	Declarada	1217,460	FUPNAPIB
13	Corralitos	Refugio de Vida Silvestre	Declarada	6921,647	EDUCA
14	Cusuco	Parque Nacional	Declarada	17704,305	Mancomunidad Omoa, San Pedro Sula y Quimistan
15	Danli (Piedra de Apagüiz)	Zona Productora de Agua	Declarada	16186,092	Municipalidad de Danlí
16	El Armado	Refugio de Vida Silvestre	Declarada	3572,130	Ninguno
17	El Chiflador	Reserva Biológica	Declarada	3385,395	Municipalidad de Marcala

Id.	Name	Management Category	Official State	Area (ha)	Co-management
18	El Chile	Reserva Biológica	Declarada	6452,602	Compañía Azucarera Tres Valles
19	El Jicarito	Área de Manejo Hábitat/Especie	Declarada	6919,441	CODDEFFAGOLF
20	El Pital	Reserva Biológica	Declarada	675,013	Programa MARENA
21	Erapuca	Refugio de Vida Silvestre	Declarada	6522,222	Programa MARENA
22	Guajiquiro	Reserva Biológica	Declarada	28143,102	INADES
23	Guanaja	Reserva Forestal	Declarada	2707,872	BICA
24	Güisayote	Reserva Biológica	Declarada	18036,681	AESMO
25	Islas del Tigre	Área de Uso Múltiple	Declarada	600,954	CODDEFFAGOLF
26	Jeannette Kawas (Punta Sal)	Parque Nacional	Declarada	79381,776	PROLANSATE
27	La Berbería	Área de Manejo Hábitat/Especie	Declarada	5690,625	CODDEFFAGOLF
28	La Botija	Parque Nacional	Declarada	19079,814	Municipalidad de San Marcos de Colón
29	La Murralla	Refugio de Vida Silvestre	Declarada	24626,468	Municipalidad de La Unión
30	La Tigra	Parque Nacional	Declarada	24340,551	AMITIGRA
31	Lago de Yojoa	Área de Uso Múltiple	Declarada	30151,621	AMUPROLAGO
32	Laguna de Guaimoreto	Refugio de Vida Silvestre	Declarada	8018,728	FUCAGUA
33	Laguna de Ticamaya	Área de uso Múltiple	Declarada	442,662	Municipalidad de San Pedro Sula
34	Lancetilla	Jardín Botánico	Declarada	255,308	PROLANSATE/ESNACIFOR
35	Las Iguanas y Punta Condega	Área de Manejo Hábitat/Especie	Declarada	4169,220	CODDEFFAGOLF
36	Los Delgaditos	Área de Manejo Hábitat/Especie	Declarada	1815,417	CODDEFFAGOLF
37	Merendón	Zona Productora de Agua	Declarada	35182,220	Municipalidad de San Pedro Sula
38	Mico Quemado y las Guanchías	Zona de Reserva Ecológica	Declarada	15621, 273	Municipalidad de El Progreso
39	Misoco	Reserva Biológica	Declarada	4572,340	Municipalidad de Guaimaca
40	Mixcure	Refugio de Vida Silvestre	Declarada	12689,583	PROSAMH
41	Mogola	Reserva Biológica	Declarada	703,130	Ninguno
42	Montaña de Comayagua	Parque Nacional	Declarada	29767,091	AECOSIMCO
43	Montaña de San Pablo	Reserva Biológica	Declarada	1026,692	Ninguno
44	Montaña de Yoro	Parque Nacional	Declarada	15352,875	Ninguno
45	Montaña de Pacayal	Reserva Biológica	Declarada	2259,042	Ninguno

Id.	Name	Management Category	Official State	Area (ha)	Co-management
46	Montaña Verde	Refugio de Vida Silvestre	Declarada	12407,403	COPIN
47	Montecillos	Reserva Biológica	Declarada	20333,238	ESNACIFOR
48	Opalaca	Reserva Biológica	Declarada	26409,806	Programa MARENA
49	Patuca	Parque Nacional	Declarada	376446,809	Asociación Patuca
50	Pico Bonito	Parque Nacional	Declarada	107107,454	FUPNAPIB
51	Pico Pijol	Parque Nacional	Declarada	11508,158	AECOPIJOL
52	Puca	Refugio de Vida Silvestre	Declarada	5466,475	Fundación Puca
53	Punta Izopo	Parque Nacional	Declarada	21535,451	PROLANSATE
54	Río Plátano	Reserva de la Biósfera	Declarada	833616,720	GTZ
55	Sabanetas	Reserva Biológica	Declarada	8198,045	Ninguno
56	San Bernardo	Área de Manejo Hábitat/Especie	Declarada	9490,922	CODDEFFAGOLF
57	San Pedro	Reserva Biológica	Declarada	1129,494	Ninguno
58	Santa Bárbara	Parque Nacional	Declarada	13951,215	Municipalidad de Santa Bárbara
59	Sierra de Agalta	Parque Nacional	Declarada	51792,676	Asociación de Municipios de Olancho y Municipios Mártires de La Sierra de Agalta
60	Tawahka –Asangni	Reserva de la Biósfera	Declarada	252057,708	ICADE, ACOCODE/BTA
61	Texiguat	Refugio de Vida Silvestre	Declarada	29763,69	PROLANSATE
62	Volcán Pacayita	Reserva Biológica	Declarada	10249,260	AESMO
63	Yerba Buena	Reserva Biológica	Declarada	3522,375	VITA de Honduras
64	Yuscarán (Montserrat)	Reserva Biológica	Declarada	4082,524	Fundación Yuscarán
1	Barbareta	Reserva Marina	Propuesta	10107,609	BICA-PMAIB
2	Barra de Río Motagua	Reserva Biológica	Propuesta	8843,732	Cuerpos de Conservación
3	Boquerón	Monumento Natural	Propuesta	4371,408	Comunidad de Boquerón
4	Botaderos	Parque Nacional	Propuesta	64221,173	Iniciativa de Delta State University
5	Capiro y Calentura	Parque Nacional	Propuesta	4858,310	FUCAGUA
6	Carias Bermúdez	Área de uso Múltiple	Propuesta	5072,742	Propiedad Privada
7	Cayos de Utila	Refugio de Vida Silvestre	Propuesta	8982,111	BICA-PMAIB
8	Cayos Misquitos	Parque Nacional Marino	Propuesta	27966,426	Fuerzas Armadas de Honduras
9	Cayos Zapotillos	Reserva Biológica	Propuesta	1063,886	Fuerzas Armadas de Honduras



Id.	Name	Management Category	Official State	Area (ha)	Co-management
10	Congolón - Coyocutena	Monumento Natural	Propuesta	46,456	COCEPRADIL
11	Cuevas de Talgua	Monumento Natural	Propuesta	105,170	Municipalidad de Talgua/IHAH
12	El Cajón	Reserva de Recursos	Propuesta	48055,199	ENEE
13	El Carbón	Reserva Antropológica	Propuesta	35513,077	Ninguno
14	El Cipresal	Reserva Biológica	Propuesta	2034,304	Ninguno
15	El Coyolar	Zona Productora de Agua	Propuesta	15244,533	ENEE
16	Fortaleza de San Fernando de Omoa	Monumento Cultural	Propuesta	1,000	Municipalidad de San Fernando de Omoa/IHAH
17	Guanaja	Parque Nacional Marino	Propuesta	14568,242	BICA-PMAIB
18	Islas del Cisne	Reserva Marina	Propuesta	458,194	Fuerzas Armadas de Honduras
19	Laguna de Caratasca	Reserva Biológica	Propuesta	133749,594	Ninguno
20	Mocorón	Reserva Forestal	Propuesta	68167,217	Ninguno
21	Montaña de La Flor	Reserva Antropológica	Propuesta	4996,954	Ninguno
22	Petroglifos de Ayasta	Monumento Cultural	Propuesta	1,000	Ninguno
23	Port Royal	Refugio de Vida Silvestre	Propuesta	874,050	BICA
24	Río Kruta	Parque Nacional	Propuesta	60092,850	Ninguno
25	Río Toco	Monumento Natural	Propuesta	16,018	Ninguno
26	Ruinas de Copán	Monumento Cultural	Propuesta	1297,860	IHAH
27	Ruinas de Tenanpúa	Monumento Cultural	Propuesta	37847,497	Ninguno
28	Rus-Rus	Reserva Biológica	Propuesta	116348,559	Ninguno
29	Sandy Bay – West End	Reserva Marina	Propuesta	5756,965	BICA
30	Santa Elena	Refugio de Vida Silvestre	Propuesta	1421,817	Programa MARENA
31	Sierra de Río Tinto	Reserva Forestal	Propuesta	69486,880	Ninguno
32	Turtle Harbour	Reserva Marina	Propuesta	2710,316	BICA
33	Wuarunta	Parque Nacional	Propuesta	65310,711	Ninguno

\* One is missing....

# ANNEX 8. LIST OF PRIORITY PROTECTED AREAS OF HONDURAS

There is an additional group of chosen areas where the ecological integrity monitoring-EIM (DAPVS-AFE-COHDEFOR 2007) will be applied.

The selection of the preliminary areas for monitoring has been based on three criteria: (1) listed as a priority area, (2) has been legally declared and (3) has an approved management plan.

No	Nombre Área Protegida	Área (s) de apoyo	Situación Legal	Región Forestal	EIM area	EIM area with institutional presence	EIM area with baseline information and expert support
SERNA 2006. "Estado de Areas Protegidas"					DAPVS-AFE-COHDEFOR 2007. Monitoreo de Integridad Ecológica		
1	Colibrí Esmeralda Hondureño (Arenal)		Decreto	Yoro			
2	Botaderos		Propuesta	Olancho/Atlántida			
3	Capiro y Calentura		Acuerdo	Atlántida			
		Laguna de Guaymoreto	Acuerdo	Atlántida			
4	Cayos Cochinos		Decreto	Atlántida	X	X	X
5	Celaque		Decreto	Occidente	X	¿?	X
6	Cerro Azul Meámbar		Decreto	Comayagua	X	X	X
7	Cuero y Salado		Decreto	Atlántida	X	X	X
8	Cuevas de Taulabé		Propuesta	Comayagua			
9	Cusuco		Decreto	Nor-occidente			
10	El Boquerón		Propuesta	Olancho			
11	El Chile		Decreto	Francisco Morazán	X	X	¿?
12	Guanacaure		Decreto	Zona Sur			
13	Golfo de Fonseca			Zona Sur			

No	Nombre Área Protegida	Área (s) de apoyo	Situación Legal	Región Forestal	EIM area	EIM area with institutional presence	EIM area with baseline information and expert support
	SERNA 2006. "Estado de Areas Protegidas"				DAPVS-AFE-COHDEFOR 2007. Monitoreo de Integridad Ecológica		
		Bahía de Chismuyo	Decreto		X	¿?	X
		Bahía de San Lorenzo	Decreto		X	¿?	¿?
		El Jicarito	Decreto		X	¿?	X
		Isla del Tigre	Decreto		X	¿?	¿?
		La Berbería	Decreto		X	¿?	¿?
		Las Iguanas-Punta Condega	Decreto		X	¿?	¿?
		Los Delgaditos	Decreto		X	¿?	¿?
		San Bernardo	Decreto		X	¿?	¿?
14	Islas de la Bahía	Varios (8 áreas)	Acuerdo	Atlántida			
15	Islas del Cisne		Acuerdo	Atlántida			
16	Jeannette Kawas (Punta Sal)		Decreto	Atlántida	X	X	¿?
17	La Botija		Decreto	Zona Sur			
18	La Muralla		Decreto	Olancho			
19	La Tigra		Decreto	Francisco Morazán	X	X	X
20	Lago de Yojoa		Decreto	Nor-occidente	X	X	X
21	Laguna de Caratasca		Propuesta	La Mosquitia			
22	Lancetilla		Decreto	Atlántida			
23	Merendón		Decreto	Nor-occidente			
24	Montaña de Santa Bárbara		Decreto	Nor-occidente	X	¿?	¿?
25	Montaña Verde		Decreto	Comayagua			
26	Montaña de Yoro		Decreto	Yoro	X	¿?	¿?
27	Opalaca		Decreto	Comayagua			
28	Patuca		Decreto	Olancho	X	X	X
29	Pico Bonito		Decreto	Atlántida	X	X	X
30	Pico Pijol		Decreto	Yoro	X	¿?	¿?

No	Nombre Área Protegida	Área (s) de apoyo	Situación Legal	Región Forestal	EIM area	EIM area with institutional presence	EIM area with baseline information and expert support
	SERNA 2006. "Estado de Areas Protegidas"				DAPVS-AFE-COHDEFOR 2007. Monitoreo de Integridad Ecológica		
31	Río Kruta		Propuesta	La Mosquitia			
32	Río Plátano		Decreto	Río Plátano	X	X	X
33	Rus Rus		Propuesta	La Mosquitia			
34	Sierra de Agalta		Decreto	Olancho	X	X	X
35	Tawahka		Decreto	La Mosquitia/Olancho	X	X	X
36	Texiguat		Decreto	Atlántida			
37	Trifinio Montecristo		Decreto	Occidente	X	¿?	X
38	Warunta		Propuesta	La Mosquitia			

# ANNEX 9. MILLENNIUM DEVELOPMENT GOALS 2000–2006

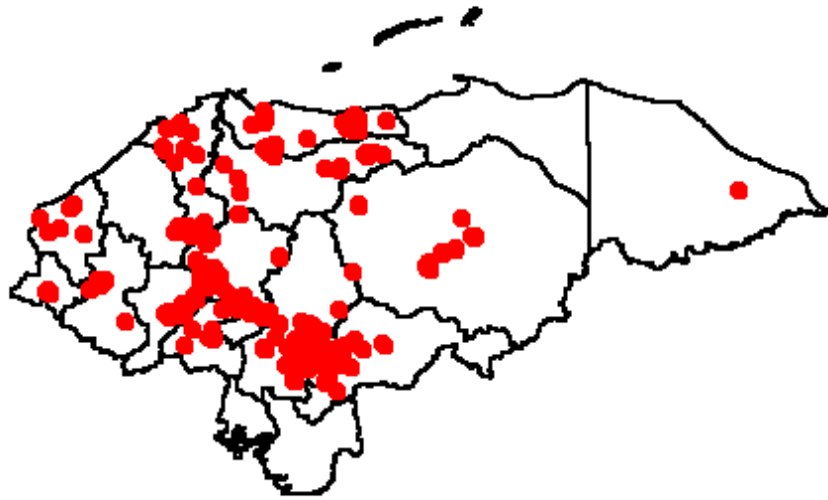
The information below comes from the World Development Indicators database ([http://ddpext.worldbank.org/ext/ddpreports/ViewSharedReport?&CF=1&REPORT\\_ID=1336&REQUEST\\_TYPE=VIEWADVANCED&HF=N/IDGProfile.asp](http://ddpext.worldbank.org/ext/ddpreports/ViewSharedReport?&CF=1&REPORT_ID=1336&REQUEST_TYPE=VIEWADVANCED&HF=N/IDGProfile.asp)).

Millennium Development Goals		
	2000	2006
<b>Goal 1: Eradicate extreme poverty and hunger</b>		
Employment to population ratio, 15+, total (%)	63	69
Employment to population ratio, ages 15-24, total (%)	54	60
Malnutrition prevalence, weight for age (% of children under 5)	12,5	8,6
<b>Goal 2: Achieve universal primary education</b>		
School enrollment, primary (% net)	89	96
<b>Goal 3: Promote gender equality and empower women</b>		
Proportion of seats held by women in national parliament (%)	9	23
Ratio of female to male enrollments in tertiary education	126	141
Ratio of female to male primary enrollment	101	99
Share of women employed in the nonagricultural sector (% of total nonagricultural employment)	50,5	45,3
<b>Goal 4: Reduce child mortality</b>		
Immunization, measles (% of children ages 12-23 months)	98	91
Mortality rate, infant (per 1,000 live births)	32	23
Mortality rate, under-5 (per 1,000)	40	27
<b>Goal 5: Improve maternal health</b>		
Adolescent fertility rate (births per 1,000 women ages 15-19)	107	95
Births attended by skilled health staff (% of total)	56	67
Contraceptive prevalence (% of women ages 15-49)	62	65
Pregnant women receiving prenatal care (%)	83	92
<b>Goal 6: Combat HIV/AIDS, malaria, and other diseases</b>		
Incidence of tuberculosis (per 100,000 people)	89	76
Tuberculosis cases detected under DOTS (%)	105	85
<b>Goal 7: Ensure environmental sustainability</b>		
CO2 emissions (kg per PPP \$ of GDP)	0,3	0,4

Millennium Development Goals		
	2000	2006
CO2 emissions (metric tons per capita)	0,8	1,1
Forest area (% of land area)	49	42
Improved sanitation facilities (% of population with access)	65	69
Improved water source (% of population with access)	87	87
<b>Goal 8: Develop a global partnership for development</b>		
Aid per capita (current US\$)	72	84
Debt service (PPG and IMF only, % of exports of G&S, excl. workers' remittances)	8,5	4,2
Internet users (per 100 people)	1,2	4,8
Mobile phone subscribers (per 100 people)	2,5	32,2
Telephone mainlines (per 100 people)	4,8	10,2
<b>Other</b>		
Fertility rate, total (births per woman)	4,0	3,4
GNI per capita, Atlas method (current US\$)	890	1.270
GNI, Atlas method (current US\$) (billions)	5,5	8,8
Gross capital formation (% of GDP)	30,7	32,9
Life expectancy at birth, total (years)	68	70
Population, total (millions)	6,2	7,0
Trade (% of GDP)	96,6	107,3

# ANNEX 10. DISTRIBUTION OF ENDEMIC SPECIES IN HONDURAS

The information below comes from House et al. (2002).



# ANNEX II. DATOS ADICIONALES EN EL ÁMBITO FORESTAL

Datos adicionales.

El inventario establece una superficie de bosques latifoliados primarios de 457,419 ha, (18%). Los bosques latifoliados intervenidos representan el 82% de la superficie total de este tipo de bosque. El volumen comercial de las especies comerciales se estimó en 33,574,203 m<sup>3</sup> con una densidad de 22 árboles/ha. El bosque de coníferas se componen en su mayoría de bosques maduros y medios (42 y 40%, respectivamente), sin embargo el 33% de ellos son ralos. Esta información sumada a la evidencia de que la corta selectiva es el único tratamiento de carácter silvicultural que se les brinda a estos bosques, debe apoyar la toma de decisiones inmediatas para mejorar la aplicación de estos tratamientos para el manejo sostenible del bosque. El volumen comercial de los bosques de coníferas se estimó en 72.057.895 m<sup>3</sup>, siendo los bosques maduros los que más volumen aportan con 32, 731,777 m<sup>3</sup> y los bosques medios con 24, 751,749 m<sup>3</sup>.

Marco legal que define el accionar del sector forestal.

En primera instancia se considerara la Constitución de la República como la plataforma jurídica nacional (Decreto No. 131 de fecha 11 de enero de 1982. Artículos 171,172, 272, 274, 340 y 354. En una segunda instancia se encuentran los Decretos Legislativos Forestales, Acuerdos Ejecutivos Forestales y la Legislación de Naturaleza Administrativa y Financiera, una tercera instancia son las Leyes Conexas, una cuarta instancia son los convenios y tratados internacionales y una quinta instancia son las cumbres presidenciales . En este marco se destaca la siguiente normativa;

- Ley Forestal, Áreas Protegidas y Vida Silvestre, Decreto 98 - 2007
- Ley de Municipalidades Decreto 134-91
- Ley General del Ambiente Decreto 104-93
- Reglamento de la Ley del Ambiente Decreto 109-93
- Ley del ministerio publico decreto 228-93
- Ley del Colegio de Profesionales Forestales Decreto 70-89
- Ley del Colegio de Ingenieros Forestales Decreto 69-89
- Reformas al 1039-93 Acuerdo 03-96
- Uso de las tierras nacionales Decreto 016-96
- Ley de los bosques nublados Decreto 87-87
- Ley de creación de ESNACIFOR Decreto 136-93



- Declaración de Áreas Protegidas Decreto 1118-92
- Uso del fuego Acuerdo 004-98
- Ley de Biocombustibles Decreto 144 - 2007
- Ley de Ordenamiento Territorial Decreto 180 - 2003
- Ley de Transparencia Decreto 170 – 2006
- Ley de Simplificación Administrativa Decreto 255 – 2002
- Categorización de Proyectos para efectos de los Estudios de Impacto Ambiental Acuerdo No. 635 - 2003

#### Decentralization: Municipalities and the Decree 134-91

Esta ley contiene disposiciones que dan a las municipalidades y a las comunidades, una mayor participación en la defensa, protección y mejoramiento de sus recursos naturales, en los que se destacan aspectos tales como: protección de la ecología y el medio ambiente, promoción de la reforestación, racionalización del uso y aprovechamiento de los recursos naturales, recaudación de recursos propios para preservar el medio ambiente, celebrar convenios de aprovechamiento y protección de los recursos naturales, etc. En la actualidad se encuentra en el Soberano Congreso de la República un Proyecto de Reformas a la Ley de Municipalidades la cual fortalece temas como:

- La autonomía municipal
- La creación voluntaria de las mancomunidades
- Se define y estructura el Comité de Desarrollo Municipal
- Se incorpora la figura del Comisionado Municipal
- Se fortalece la figura de los Alcaldes Auxiliares y otras formas de organización comunitaria
- Toda entidad estatal, privada, organización no gubernamental (ONG) y otras similares, que proyecte la ejecución de obras y servicios públicos en el término municipal, deberá ser aprobada previamente por la Corporación Municipal

#### **Convenciones internacionales relevantes a las que ha adherido el país; acciones tomadas para observar los compromisos internacionales sobre bosques;**

Honduras ha participado en diferentes convenciones, foros y tratados internacionales sobre el desarrollo sostenible, entre estos se encuentran: Agenda 21; Alianza Centroamericana para el Desarrollo Sostenible (ALIDES); Acuerdo Marco de las Naciones Unidas sobre Cambio Climático; Convención Interamericana contra la corrupción; Principios para un consenso mundial con respecto a la conservación y desarrollo sostenible de todos los tipos de bosques; Cumbres Presidenciales de Santa Cruz, Bolivia y Santiago, Chile donde se adoptó una agenda de reformas institucionales para el desarrollo sostenible, la transparencia y la participación pública como parte del proceso democrático. Recientemente fue extendido el Acuerdo entre los Gobiernos de Centroamérica y los Estados Unidos (CONCAUSA) que propone esfuerzos con una mayor cooperación para encarar los cambios climáticos y el desarrollo sostenible mediante investigación científica y promoción de inversiones en la conservación forestal, mejoramiento del consumo de energía, utilización de nuevas tecnologías medioambientales, mejoramiento de la capacidad para adaptarse al cambio climático y cooperación para un mejor entendimiento de su impacto regional (Informe de País, Johannesburgo, 2002)

Entre estos tratados y convenciones firmadas por el país podemos mencionar los mas relevantes:

- Convenio de Especies Amenazadas de Flora y Fauna Silvestre (CITES, 1995)
- Cumbre de la Tierra, Río de Janeiro, Brasil (Junio de 1992)
- Plan de Acción Forestal Tropical para Centroamérica, Convenio Regional para el Manejo y Conservación de los Ecosistemas Naturales Forestales y el Desarrollo de Plantaciones Forestales (Septiembre de 1992)
- Convenio sobre Pueblos Indígenas y Tribales en Países independientes (Convenio No.169. Decreto 26-94 del 30 de Julio de 1994)
- Convenio de Diversidad Biológica (1995)
- Convenio Centroamericano de Áreas Silvestres Prioritarias en América Central (1995)
- Convenio Marco sobre Cambio Climático (1996)
- Alianza Centroamericana para el Desarrollo Sostenible
- Convención de las Naciones Unidas para combatir la Desertificación (1997)
- Convenio relativo a los Humedales de Importancia Internacional (RAMSAR)
- Convención sobre la Protección del Patrimonio Mundial Cultural y Natural (1972)
- Convención para la Protección de la capa de ozono (1993)
- Protocolo de Cartagena sobre Bioseguridad (2000)
- Protocolo constitutivo de la Comisión Centroamericana de Ambiente y Desarrollo (1991)

### **Honduras en el marco de los compromisos internacionales**

Honduras, ha participado en la labor del Grupo Intergubernamental de Bosques desde sus inicios contrayendo compromisos a nivel internacional, con la idea de ordenar las acciones que en materia institucional, política y de participación ciudadana que han permitido elaborar el Programa Forestal Nacional que respondiendo a las necesidades, intereses y prioridades nacionales, así como a las obligaciones y requerimientos de convenios, que tienen el objetivo de combatir la deforestación, la degradación de los bosques, promover intervenciones innovadoras para mejorar el manejo de bosques, y para la conservación y desarrollo sostenible de todo tipo de bosque.

La adopción de Criterios e Indicadores para la Ordenación Forestal Sostenible y el Manejo de las Áreas Protegidas, son parte de las medidas de acción emprendidas a nivel nacional para el manejo, conservación y desarrollo sostenible de todos los ecosistemas forestales.

Entre la diversidad de las cooperaciones recibidas en el periodo 2002 – 2008 se han ejecutado proyectos con impactos en la definición de políticas y en la generación de estrategia y experiencias locales, que permitieron a la Administración Forestal del Estado (AFE-COHDEFOR) generar infraestructura, así como validar tecnologías para sus acciones de extensión, normalización y control. Un aspecto importante de todos estos proyectos es la incorporación de acciones de fortalecimiento institucional. El apoyo internacional se ha brindado a través de varias agencias y países amigos, entre ellas FAO, USAID, ODA, GTZ, COSUDE, PNUD, OEA, UE, WWF, ACIDI, BID, UICN, BM, FINNIDA, BCIE y otras.

Otro aspecto importante para Honduras en el marco de la regionalidad correspondiente al Sistema de Integración Centroamericana (SICA) a través de la Comisión Centroamericana de Ambiente y Desarrollo

(CCAD) han sido la incorporación de herramientas de Planificación Forestal Regional como: la Estrategia Forestal Centroamericana (EFCA), como órgano operativo del Plan Ambiental de la Región Centroamericana (PARCA) en lo que respecta al área estratégica de bosques y biodiversidad, la cual encaminó la interacción con los distintos proyectos regionales, iniciativas, convenios y acuerdos, propiciando una la interrelación de estos entre si (EFCA, 2002), La Estrategia Regional para la Conservación y uso sostenible de la Biodiversidad en Mesoamérica (2003) la Estrategia Regional para Sanidad y Manejo Forestal en América Central impulsada por la FAO (2004). Otro elemento es la posición de Centroamérica frente al Cambio Climático (FAO, 2003).

### **Lista de asociados nacionales e internacionales, programas y proyectos activos en el país que apoyen la actividad forestal**

#### **Asociados Nacionales**

##### **A nivel Gubernamental**

- Secretaría de Agricultura y Ganadería
- Secretaría de Recursos Naturales y Ambiente
- Asociación de Municipios de Honduras
- Comisión Forestal del Congreso Nacional

##### **A nivel de ONG's y de la sociedad civil**

- Foro Nacional de Convergencia
- Colegio de Profesionales Forestales de Honduras
- Colegios de Ingenieros Forestales de Honduras
- Asociación de Mujeres Profesionales Forestales de Honduras
- Asociación Hondureña Agroforestal (AHA)
- Alianza Hondureña para las Áreas Protegidas (AHLAP):
- Fundación VIDA
- Red de Desarrollo Sostenible de Honduras

A nivel político, estas instancias han sido muy activas en el proceso de formulación y concertación de las políticas y ley forestal. A nivel de su accionar hacia el recurso bosque, se han orientado a coordinar acciones entre grupos campesinos y productores dedicados a la Forestería y Agroforestería Comunitaria; Otro sector se ha orientado a la protección y conservación de los recursos naturales, a través de convenios de Co – Manejo entre el Estado, gobiernos locales y Organismos no Gubernamentales con la finalidad de compartir responsabilidades con la sociedad civil a fin de generar actividades de gestión y canalización de recursos humanos y financieros para el manejo de las áreas protegidas

##### **A Nivel del Sector Privado**

- Asociación de Madereros de Honduras
- Asociación Nacional de Transformadores de la Madera
- Asociación de Propietarios de Bosques
- Fundación de la Red de Reservas Naturales Privadas

- Fundación para la Inversión y Desarrollo Económico

Tradicionalmente a el sector privado ha estado representado por la dos primeras asociaciones, formando parte del Consejo Directivo de la Administración Forestal del Estado.

En la actualidad el sector privado, está siguiendo lineamientos establecidos en la Estrategia Nacional de Competitividad liderada por la Fundación para la Inversión y Desarrollo Económico<sup>1</sup> (FIDE) la cual es una entidad privada sin fines de lucro. La Fundación colabora muy de cerca con el gobierno en la revisión de acciones en favor de un nuevo marco jurídico que fomente un ambiente comercial más favorable en Honduras. La misión de la FIDE en la actualidad es fomentar el desarrollo sostenible en Honduras mediante el fortalecimiento de las inversiones y exportaciones y a través de una constante mejora de la competitividad del país y sus compañías en el ámbito internacional.

En el marco de la Estrategia Nacional de Competitividad para Honduras, algunos de los sectores productivos definidos como prioritarios son el de agroindustria e industria alimentaria de alto valor agregado, industria forestal y de muebles de madera, turismo diferenciado y textiles. Cada uno de estos clústeres plantea retos específicos, pero todos ellos deben desarrollarse de forma tal que se dé un encadenamiento con las pequeñas y medianas empresas. Este desarrollo debe darse de manera sostenible en cuanto a recursos naturales y humanos, aumentando el valor agregado a los productos correspondientes, a través de la diferenciación de los mismos, atrayendo inversión extranjera e incorporando tecnologías de avanzada en los procesos productivos. En todos estos sectores productivos claves, se propone una evaluación del estado actual de sus PYMEs, así como el desarrollo de programas de capacitación para el desarrollo de negocios. También, se tiene pensado tener una labor de promoción para que las diversas PYMEs se asocien y se puedan aprovechar las economías de escala que se generarán.

### **Fondo de Competitividad**

Una de las principales herramientas de Honduras Compite es el Fondo de competitividad<sup>2</sup> (FC), el cual se constituye como un instrumento de respuesta rápida y flexible para: Financiar a nivel de pre-inversión las actividades de clusters ya existentes o grupos de empresas en formación, por medio de aportes no reembolsables (matching grants), para proyectos cofinanciados de asistencia técnica y/o provisión de servicios de proveedores y demás actividades que contribuyan la implementación de la Estrategia Nacional de Competitividad.

### **Beneficiarios**

Los grupos de empresas que deseen ser beneficiarios deben presentar un proyecto el cual será considerado y aprobado por la Comisión Evaluadora del Fondo. Como requisito de las actividades a financiar, las propuestas de proyecto deberán de estar vinculadas a los sectores identificados como prioritarios en la Estrategia Nacional de Competitividad: Forestal, Agroindustrial- Agronegocios y Turismo

### **Asociados Internacionales ligados a la Biodiversidad y Bosques**

- Cooperación Bilateral

### **Cooperación Alemana<sup>3</sup>**

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<sup>1</sup> [http://www.hondurasinfo.hn/es\\_01.asp](http://www.hondurasinfo.hn/es_01.asp)

<sup>2</sup> [http://www.hondurascompite.com/fondo\\_competitividad.html](http://www.hondurascompite.com/fondo_competitividad.html)

<sup>3</sup> <http://www.gtz.de/en/weltweit/lateinamerika-karibik/634.htm>

The primary objectives of cooperation between the Government of Honduras and the Federal Republic of Germany are poverty reduction and the promotion of sustainable development. GTZ works in three priority areas in Honduras:

- basic education
- environmental policy, protection and sustainable use of natural resources
- sustainable economic development

Work within the specific sector programs is based on the poverty reduction strategy and covers the areas of decentralization and municipal promotion. One central component is attention to the social interests and participation of men and women respectively.

Programs and Projects

- [Promotion of sustainable use of natural resources and local economic development in Honduras](#)

#### **Cooperación Canadiense (ACDI)<sup>4</sup>**

**La Cooperación Canadiense se ha manejado a través del Fondo de Manejo del Medio Ambiente Honduras-Canadá**, es el resultado del Memorando de Entendimiento firmado por Honduras y Canadá con el propósito de establecer la iniciativa para la Reconversión de la Deuda de la Ayuda Oficial de la Asistencia para el Desarrollo de América Latina, y conforme a la cual Honduras se compromete a pagar en moneda local, Lempiras, CDN\$ 16,507,630.34, en cambio, Canadá se compromete a gestionar la aprobación parlamentaria necesaria para reducir la deuda en forma proporcional de Honduras con Canadá.

Ambos países convinieron que los recursos así generados se destinaren a un fondo para el financiamiento de proyectos vinculados al medio ambiente y al desarrollo sostenible, los que se identificarían y seleccionarían mediante mecanismos que mutuamente establecieren.

La ejecución de proyectos estará a cargo de entidades privadas y públicas, grupos comunitarios y centros de estudios de temas relativos al medio ambiente.

Tal y como se indica arriba, el objetivo principal del Fondo es facilitar el manejo sostenible de los recursos naturales y la protección del medio ambiente, a la vez que se mejoran las condiciones socioeconómicas de la población. En consecuencia sus actividades estarán orientadas a:

- Promover la ejecución de programas y proyectos que ataquen problemas ambientales ya identificados.
- Fortalecer instituciones públicas y privadas que estén interviniendo o deseen hacerlo en el sector del medio ambiente.

#### **FAO - Honduras**

La FAO ha cooperado exitosamente con el Gobierno de Honduras, ha apoyado actividades de fortalecimiento técnico e institucional de la Administración Forestal del Estado (AFE/COHDEFOR), también a través de sus proyectos, ha formulado esquemas específicos de inversión<sup>5</sup>

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<sup>4</sup> [http://www.funbanhcafe.hn/honduras\\_canada.html](http://www.funbanhcafe.hn/honduras_canada.html)

<sup>5</sup> Comunicación personal con el Lic. Carlos Zelaya, Oficial adjunto de la FAO-Honduras

La FAO, en los últimos años ha apoyado las siguientes iniciativas de Proyecto en el marco del sector forestal

- Estrategia Regional para Sanidad y Manejo Forestal en América Central (2002-2004)
- Apoyo al desarrollo de una Estrategia Regional de Cooperación para la prevención, control y combate de incendios forestales (2004-2006)
- Proyecto Bosques y Cambio Climático en América Central (PBCC) (2001 – 2002)
- Operacionalización del marco jurídico forestal y del Programa Nacional Forestal (2005 – 2006)
- Bosque, Agrobiodiversidad para la Seguridad Alimentaria con Equidad de Género (2007- 2008)
- El mecanismo “FACILITY” para los Programas Nacionales Forestales Nacionales

### **Organización Internacional de las Maderas Tropicales (OIMT)**

Honduras como uno de los miembros de la OIMT acordaron realizar esfuerzos para conseguir, al finalizar el siglo, un comercio internacional de maderas tropicales extraídas de bosques bajo ordenación sostenible. Este compromiso se conoce como el "Objetivo del Año 2000" y gran parte de los proyectos y actividades que presenta Honduras a la OIMT está dedicado a la consecución de este objetivo. Una [evaluación realizada en el año 2000](#) reveló que los países tropicales habían realizado avances significativos en la formulación y adopción de políticas compatibles con este objetivo, pero que se había alcanzado un progreso más limitado en la ejecución de dichas políticas.<sup>6</sup>

Honduras es uno de los países con oportunidades de gestión de proyectos con la creación del sector forestal en el marco de la nueva Ley. La OIMT ha apoyado a Honduras recientemente con los siguientes proyectos:

- Utilización Industrial de Especies Forestales menos conocidas en los bosques bajo manejo forestal sostenible (PROINEL)
- Manejo y conservación de los manglares (PROMANGLE)
- Proyecto de Estudio de Crecimiento de Especies Nativas de interés comercial en Honduras (ESNACIFOR)
- Proyecto de Fortalecimiento al Centro de Información y Estadísticas Forestales (2007)

### ***Cooperación Multilateral***

#### **La Unión Europea**

La cooperación de la CE en Honduras se ha venido incrementando constantemente en los últimos 15 años, pasando de un promedio de 17 millones por año durante el periodo 1992 a 1997 a 57 millones de Euros para el periodo 2002 – 2006. Actualmente la cartera de proyectos en ejecución es de más de 300 millones de Euros<sup>7</sup>

La Unión Europea a través de su Plan Estratégico de cooperación con Honduras para el periodo 2002 – 2006 un monto de 147 millones de Euros. De acuerdo a la Estrategia los Programas de la UE en Honduras se centraran fundamentalmente en tres prioridades:

- Apoyo al desarrollo local y la descentralización

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<sup>6</sup> <http://www.itto.or.jp/live/PageDisplayHandler?pagelid=30005>

<sup>7</sup> [www.delnic.ec.europa.eu](http://www.delnic.ec.europa.eu) . Fuente. Delegación de la Comisión Europea

- Apoyo a la Educación
- Gestión Sostenible de Recursos Naturales

Proyectos que se financian actualmente:

- Fortalecimiento de la Gestión Local de los Recursos Naturales de las cuencas de los ríos Patuca, Negro y Choluteca (FORCUENCAS)<sup>8</sup>
- Proyecto de Gestión Sostenible de Recursos Naturales y Cuencas del Corredor Biológico Mesoamericano en el Atlántico Hondureño (PROCORREDOR – CARIBE) (30 millones de Euros)
- Proyecto de Apoyo a la Gobernabilidad en el Sector Forestal (PAGOF). Este proyecto se encuentra en su fase preparatoria (estimado en 68 millones de Euros)

### **Banco Interamericano de Desarrollo (BID)**

Honduras ha identificado la reducción de la pobreza como su desafío principal. Consecuentemente ha preparado una estrategia de reducción de la pobreza que cuenta con el apoyo de la comunidad local e internacional como parte de la iniciativa de los Países Pobres Altamente Endeudados (HIPC). Honduras es parte del HIPC desde diciembre de 1999.

La estrategia de país (2007 – 2010) está diseñada para asistir al Gobierno en sus esfuerzos por reducir la pobreza; promoviendo un mayor crecimiento que puede ser sostenido por la competitividad y por un aumento en la capacidad de producción de los sectores más pobres.<sup>9</sup>

Las áreas estratégicas en las que el BID se enfoca son:

- Incremento de la competitividad de las actividades productivas;
- Apoyo al desarrollo del capital humano;
- Fortalecimiento de la gobernabilidad

Programas y Proyectos

- [Programa de Fomento de Negocios Rurales \(PRONEGOCIOS\)](#)
- [Programa Nacional de Turismo Sostenible \(PNTS\)](#)
- [Diseños y Estudios Ambientales del Corredor Turístico El Progreso - Tela](#)
- Consolidación del Ordenamiento de los Ecosistemas de las Islas de la Bahía

### **Banco Mundial (BM/GEF)**

La gestión ambiental y el desarrollo rural forman parte de las prioridades del Banco Mundial. Así, el Banco financia proyectos que ayudan a los pueblos indígenas y a los habitantes rurales a manejar los recursos forestales a través del [Proyecto de Bosques y Productividad Rural](#) y a proteger la zona

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<sup>8</sup> <http://www.forcuencas.org/index.php?categoria=9>

<sup>9</sup> [http://www.iadb.org/countries/strategy.cfm?id\\_country=HO&language=Spanish](http://www.iadb.org/countries/strategy.cfm?id_country=HO&language=Spanish)

más extensa que aún queda del bosque tropical húmedo entre Honduras y Nicaragua el [Proyecto de Reserva de la Biosfera Transfronteriza Corazón](#).<sup>10</sup>

Otro aspecto importante es el financiamiento proveniente de Japón y del Fondo para el Medio Ambiente Mundial (FMAM) los cuales son manejados por el Banco a razón de apoyar el [Proyecto de Bosque Sostenible Pico Bonito](#), que apunta a usar el financiamiento generado por la venta de créditos de emisiones de biocarbón para ayudar a desarrollar y proteger los bosques tropicales cercanos a la ciudad de La Ceiba.

Programa de las Naciones Unidas para el Desarrollo (PNUD)

Para cumplir con su función, ambas partes (gobierno y PNUD) han suscrito el [Acuerdo con el Gobierno de Honduras](#), el Planes de Acción para los Programas de País ( [CPAP](#) ) y el “Marco de Asistencia de las Naciones Unidas para el Desarrollo 2007-2011 (United Nations Development Assistance Frameworks, [UNDAF 2007-2011](#) ) documentos que establecen las condiciones básicas y responsabilidades a través de las cuales el PNUD presta su asistencia en la ejecución de proyectos que contribuyan al desarrollo del país.<sup>11</sup>

En el UNDAF 2007-2011 cuyos ejes transversales son la equidad de género y los derechos humanos, se establecieron las siguientes prioridades:

1. Invertir en las personas
2. Desarrollo Rural y Seguridad Alimentaria
3. Ambiente y Energía
4. Gobernabilidad Democrática
5. VIH - SIDA

A través de la prioridad de Ambiente y Energía el PNUD posee en ejecución los siguientes proyectos:

- [Autoevaluación de las Capacidades Nacionales para el Cumplimiento de los Compromisos Ambientales Globales](#)
- [Creación de Capacidad para la Etapa II Adaptación al Cambio Climático en Centroamérica, México y Cuba](#)
- [Promoviendo el Manejo Integrado de Ecosistemas y de Recursos Naturales en Honduras](#)
- [Preparación de la Segunda Comunicación Nacional de Honduras a la Convención Marco de Naciones Unidas sobre Cambio Climático](#)
- [Mercados Centroamericanos para la Biodiversidad \(CAMBIO\): Transversalización de la conservación y el uso sostenible de la biodiversidad en el desarrollo y financiamiento de las micro-, pequeñas y medianas empresas](#)
- [Apoyo a la Implementación del Programa de Manejo Ambiental de las Islas de la Bahía \(PMAIB\), Segunda Etapa](#)

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<http://web.worldbank.org/WBSITE/EXTERNAL/BANCOMUNDIAL/EXTSPPAISES/LACINSPANISHEXT/HONDURASINSPANISHEXTN/0,,menuPK:45651>

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[http://www.undp.un.hn/UNDP\\_H.htm](http://www.undp.un.hn/UNDP_H.htm)



- [Evaluación de las capacidades y prioridades del País para implementar el Plan de Acción de la Estrategia Nacional de Biodiversidad](#)
- Conservación de Ecosistemas Productivos en la Mosquita
- Ecosistemas Productivos en Bosque Seco
- Conservación de Bosques de Pino - Encino

### El G-16 o Grupo de Seguimiento

El G-16 se ha convertido en una instancia que en los últimos años ha dado cabida a amplios sectores de la hondureñidad, la constituye los mecanismos tripartitos de coordinación entre el Gobierno, sociedad civil y cooperantes. Con ello, además de fortalecer la gobernabilidad se están capitalizando múltiples enseñanzas a cada uno de los sectores, lo cual habrá de contribuir a mejorar los procesos de participación que en la actualidad se están impulsando.

La Cooperación Internacional o Grupo de Donantes en el país se constituyeron como un Grupo, inicialmente integrado por Alemania, Canadá, España, Estados Unidos y Suecia (G-5), el cual se conformó para comenzar acciones para establecer en el país un mecanismo nacional de seguimiento que incluyera la participación de la sociedad civil. Progresivamente se han ido incorporando al Grupo otros países y organismos multilaterales, hasta llegar a constituir lo que ahora se denomina G-16.

Esencialmente, el propósito del G-16 ha consistido en dar seguimiento al proceso de reconstrucción y posteriormente al de transformación del país, definido en el **Plan Maestro de la Reconstrucción y la Transformación Nacional (PMRTN)**, presentado por Honduras, en el que se definieron los objetivos orientados a reactivar la economía, combatir la pobreza y promover el desarrollo humano, reducir la vulnerabilidad e incrementar la participación democrática.<sup>12</sup>

Desde su constitución, el G-16 ha logrado sentar las bases para una asociación de largo plazo con el Gobierno de Honduras y la Sociedad Civil, contribuyendo a la elaboración y puesta en marcha de la [Estrategia para la Reducción de la Pobreza \(ERP\)](#) y apoyando en su seguimiento. Asimismo, las prioridades y metas establecidas en la ERP están relacionadas en forma estrecha con los [Objetivos de Desarrollo del Milenio](#), acordados por 189 países en septiembre del año 2000.

Así como Honduras ha progresado desde la recuperación y reconstrucción hasta enfrentar los retos de transformación y desarrollo, también el G-16 ha evolucionado en su papel. **Con todo, la Declaración de Estocolmo, así como la transformación nacional representan el mandato principal para el trabajo del Grupo en Honduras.**

Iniciativas forestales participativas y mecanismos de apoyo a la participación de los interesados en el proceso pfn en los niveles central y descentralizado

El apoyo sustantivo brindado al país por la FAO, el PNUD y otras cooperaciones como GTZ y ACDI, mediante las que se ha reformulado la participación del sector social, ha logrado estimular la concertación entre los diversos actores del sector forestal, en un proceso liderado por la Administración Forestal del Estado y facilitado por la Agenda Forestal Hondureña, como un foro forestal nacional conformado por diferentes sectores gubernamentales y privados (Cooperativas Agroforestales, Municipalidades, Madereros, Colegios Forestales, Academia, ONGs)

La elaboración y concertación de la Política Forestal, de las Áreas Protegidas y de la Vida Silvestre; la elaboración y concertación de la actual Ley Forestal, de las Áreas Protegidas y de la Vida Silvestre; la

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<sup>12</sup> <http://www.gsdehonduras.org/historia.html>

actualización del Plan Nacional Forestal, la definición de los Criterios e Indicadores de Manejo Forestal Sostenible para el país, enmarcados en el Proceso Regional Centroamericano de Lepaterique, la definición de la Estrategia Nacional para los Bienes y Servicios Ambientales, son todos procesos en los cuales la participación de la sociedad organizada y la concertación de acuerdos ha sido fundamental, clara, transparente e intensa para alcanzar su concreción.

Sumándose a estos esfuerzos y fortaleciendo el enfoque intersectorial de los mismos, la Mesa Sectorial Agrícola, entre sus acuerdos de corto plazo ha estipulado la estructuración y el fortalecimiento de programas forestales prioritarios como ser el de reforestación, protección forestal y sistema social forestal, mismos que ya están incluidos en los cuatro grandes programas (Bosques y desarrollo Productivo, Bosques Agua y Servicios Ambientales, Bosques y Desarrollo Comunitario, Bosque y Biodiversidad) ya establecidos el Plan Nacional Forestal.

Asimismo, la Política Agrícola Hondureña establece a la Agenda Forestal Hondureña como un foro independiente de concertación en el sector forestal.

**Tenencia de los Bosques (incluyendo los bosques estatales y privados, las áreas protegidas, los bosques comunitarios, etc.) sistemas de manejo forestal aplicados en el país; sistemas de monitoreo e información existentes, bases de datos, inventario forestal nacional, redes**

### **Tenencia de los Bosques**

La propiedad nacional de todos los bosques del país fue durante los últimos 20 años uno de los principales motores de la deforestación ya que convertía al bosque ubicado en tierras privadas y/o comunales en un recurso apropiable por el estado en cualquier momento y por tanto más que un recurso era una limitación al uso efectivo de la tierra donde estaban ubicados.

A partir de 1992 y con la aprobación de la Ley de Modernización Agrícola, la propiedad de los bosques ubicados en tierras de tenencia privada y ejidal pasó del estado a los propietarios individuales y las municipalidades respectivamente. A partir de ese momento los propietarios de bosque están autorizados para celebrar contratos de aprovechamiento con empresas madereras que compran los derechos corte, los cuales siguen siendo aprobados en última instancia por la COHDEFOR.

Un tercer tipo de tenencia de la tierra es el llamado de tierras nacionales, las cuales están bajo la administración directa de COHDEFOR, e incluye a todas aquellos terrenos titulados a nombre del Estado hondureño. Este tipo de terrenos han sido explotados de manera no sostenible y sin mayores restricciones durante el período anterior a 1992, especialmente en las áreas de bosque latifoliado, las cuales por ubicarse en zonas más aisladas no pueden ser monitoreadas.

Para salvaguardar los ecosistemas naturales más representativos y la biodiversidad del país, de los 5.2 millones de ha de bosques existentes, 1.2 millones de ha han sido declarados por el Estado como áreas protegidas, las cuales son de propiedad del estado

En la actualidad los bosques nacionales representan el 47%, los bosques ejidales el 23% y un 30% corresponden a bosques de tenencia privada.

### **Sistema de Manejo Forestal**

A partir de la Ley de Modernización del Sector Agrícola, en 1992, se establece el manejo forestal basado en los principios de sostenibilidad que establecen al Plan de Manejo como la herramienta básica para realizar y controlar el manejo forestal. Los niveles de planificación cubren desde el nivel general (Plan Maestro para las Unidades de Gestión) hasta los planes operativos anuales.

En el país se están utilizando dos modelos de manejo para el bosque pino; el Modelo Sostenible del Bosque (MASBOSQUE) y el Modelo Centroamericano. Existen normas diferenciadas para el manejo de bosques de pino y manejo de bosques latifoliados en el país.

Los Planes de Manejo en bosques municipales y privados utilizan los métodos señalados, dependiendo del nivel de detalle y el área.

Según la AFE/COHDEFOR<sup>13</sup>, hasta el 2007 se aprobaron 82 planes de manejo forestal, en bosque nacional se aprobó un plan de manejo con una superficie total a manejar de 92,153 hectáreas; un plan de manejo en bosque ejidal con una superficie de de 695 ha y 80 planes de manejo privados con una superficie de 35,141 hectáreas

El aprovechamiento de los bosques nacionales se realiza a través del sistema de subasta el que busca generar competencia entre las empresas de la industria primaria para así obtener los mayores precios posibles por los árboles a cortar.

### **Sistemas de monitoreo e información existentes, bases de datos.**

La COHDEFOR, como encargada de ejecutar la política forestal del Estado cuenta con el Centro de Información y Estadísticas Forestales, CIEF, creado en 1994, como una dependencia del Departamento de Planificación y que tiene entre sus funciones generar información geo referenciada (Sistema de Información Geográfica), elaborar mapas, recolectar, analizar y publicar información sobre recurso forestales, producción, comercialización interna y exportación de productos forestales. Sus dos principales publicaciones son el Anuario Estadístico Forestal y el Boletín de precios de insumos, herramientas y productos forestales

La Secretaría de Recursos Naturales y Ambiente, SERNA, cuenta con un Sistema de Información Ambiental, SINEA, y un Centro de documentación y biblioteca conteniendo diferentes materiales impresos sobre aspectos relacionados a los recursos naturales y ambiente.

La Secretaría de Agricultura y Ganadería por su parte cuenta con un centro de información sobre aspectos relacionados con la agricultura y la ganadería y los recursos naturales (CEDIA).

Tanto la Escuela Nacional de Ciencias Forestales, ESNACIFOR, como el Centro Universitario Regional del Litoral Atlántico, CURLA y la Escuela Agrícola Panamericana, EAP, cuentan con bibliotecas y hemerotecas. ESNACIFOR y EAP también cuentan con sistemas de información geográfica los cuales aunque son relativamente modernos, son utilizados casi exclusivamente para fines de investigación y enseñanza.

### **Inventario forestal Nacional**

En Honduras las cifras utilizadas hasta el momento parten de:

- Mapa de Cobertura Forestal de 1965 con asistencia técnica y financiera de la FAO en la ocasión del realizarse el primer inventario nacional
- Inventario Nacional por parte de la Agencia Canadiense para el Desarrollo Internacional (CIDA) en 1980
- Proyecto de Mapeamiento de la Cobertura Forestal de Honduras, iniciado en 1986 bajo la asistencia técnica y financiera del Gobierno de Alemania (Banco para la Reconstrucción de Alemania KFW) y analizados por la empresa GAF de Alemania utilizando imágenes satélites LANDSAT de 1986 y 1989, presentado en el Mapa 1:100,000 de la GAF y FAO (AFE-COHDEFOR, 1994)
- Mapa Forestal de Honduras iniciado en 1995 con asistencia técnica y financiera del Gobierno de Alemania a través del Proyecto Programa Social Forestal (Banco para la Reconstrucción de Alemania KFW), utilizando imágenes satélites LANDSAT (EOSAT 1993 – 1995) escala 1:500,000.

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<sup>13</sup> AFE/COHDEFOR, 2007. Anuario Estadístico Forestal de Honduras

- Mapa de Ecosistemas Vegetales de Honduras, auspiciado por Secretaría de Agricultura y Ganadería, la Administración Forestal del Estado (AFE-COHDEFOR), EL Proyecto de Administración de Áreas Rurales con el apoyo financiero del Banco Mundial, utilizando imágenes satélites LANDSAT. Escala 1:500.000
- Inventario de Bosques y Árboles auspiciado por la FAO entre el 2005 y 2006.

### **Capacidad de investigación y educación forestal**

En Honduras, la educación forestal cuenta con un rango que va desde el bachillerato forestal a nivel de educación secundaria hasta diferentes centros de educación media y superior como ser: la Escuela Nacional de Ciencias Forestales (ESNACIFOR) donde se forman Dásonomos e Ingenieros Forestales con énfasis en manejo de bosques de pino y cuencas hidrográficas; la Universidad Nacional Autónoma de Honduras (UNAH) a través de el Centro Regional del Atlántico (CURLA), donde se forman Ingenieros Forestales tienen orientación en manejo de bosques latifoliados; la Universidad José Cecilio del Valle que forma Ingenieros Forestales con énfasis en economía forestal y la Universidad Católica que forma Ingenieros Ambientales, así como una Maestría en Gestión Ambiental. También se incorporan a este nivel de educación la Escuela Agrícola Panamericana conocida como Zamorano la cual forma Ingenieros Agrónomos con énfasis en recursos naturales.

Como un esfuerzo conjunto entre la ESNACIFOR y el CURLA se ha implementado la Maestría en Forestería Comunitaria.

La ESNACIFOR cuenta con un Centro de Capacitación Forestal orientado a responder a la demanda de la industria forestal, los propietarios de bosques y las instituciones y proyectos vinculados al desarrollo forestal. En la actualidad se observa un crecimiento sustancial en la demanda de cursos, talleres y otros eventos educativos. La ESNACIFOR, a través del Centro de Capacitación, cuenta con una cartera de cursos y seminarios sobre diferentes temas relacionados con las ciencias forestales: protección forestal, aprovechamiento, manejo de cuencas, viveros y reforestación, manejo de reservas forestales, guardas forestales y guarda recursos, etc.

El Centro de Capacitación de la Escuela Agrícola Panamericana, ofrece cursos y seminarios sobre aspectos relacionados con agricultura sostenible en laderas, desarrollo forestal agrícola sostenible y Agroforestería.

En la actualidad se cuenta con dos centros de investigación y documentación como son la ESNACIFOR y el CURLA. Asimismo, existen centros de investigación aplicada como ser. Jardín Botánico Lancetilla, el Centro de Utilización Productos Forestales (CUPROFOR) el cual funciona como una Fundación y la Estación Experimental La Soledad para la Conservación y Silvicultura de Especies Forestales en Honduras la cual maneja la Escuela Nacional de Ciencias Forestales

La investigación forestal en Honduras ésta está considerada como débil, entre otros aspectos porque: se adolece de instituciones consolidadas en este campo; la voluntad política y los fondos disponibles son relativamente escasos; no existe la calidad del personal para llevarla a cabo.

Por otro lado, en las instituciones relacionadas con la actividad forestal no ha existido una planificación real de las necesidades de investigación, mucho menos en su coordinación, ejecución y control. Cada institución define sus necesidades o inquietudes sobre un tema u otro a ser investigado. Se han realizado esfuerzos para coordinar estas actividades entre los centros afines, sin resultados concretos a la fecha.

La poca investigación concreta realizada en el país, en parte se ha debido al apoyo que han ofrecido proyectos de la cooperación internacional los cuales operan con recursos externos, ya sean financieros o de personal.

**U.S. Agency for International Development**

1300 Pennsylvania Avenue, NW

Washington, DC 20523

Tel: (202) 712-0000

Fax: (202) 216-3524

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