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CENTRAL AMERICA MANGROVES, TENURE, AND REDD+ ASSESSMENT

TENURE AND GLOBAL CLIMATE CHANGE (TGCC) PROGRAM

JANUARY 2016

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ACRONYMS AND ABBREVIATIONS

ANAM	National Environment Authority (Panama)
ARAP	National Authority for Aquatic Resources (Panama)
COGMANGLAR	Coordination of Guatemalan Communities for the Defense of Life and Mangroves
CONAP	National Council for Protected Areas (Guatemala)
FAO	Food and Agriculture Organization
Ha	Hectare
ICF	National Institute of Forest Conservation and Development, Protected Areas and Wildlife (Honduras)
INAB	National Forestry Institute (Guatemala)
MAGA	Ministry of Agriculture and Livestock (Guatemala)
MARN	Ministry of Environment and Natural Resources (Guatemala)
MPA	Marine Protected Area
NGO	Non-Governmental Organization
OCRET	Office of Control of State Reserve Areas (Guatemala)
Promangle	Gulf of Fonseca Mangrove Swamp Conservation Management and Conservation Project
REDD+	Reduced Emissions from Deforestation and Forest Degradation plus carbon sequestration from forest enhancement
R-PP	Readiness Preparation Proposal
SERNA	Natural Resources and Environment Department (Honduras)
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
URL-IARNA	Rafael Landivar University Institute of Agriculture, Natural Resources, and Environment
USAID	United States Agency for International Development

1.0 INTRODUCTION

Mangrove forests are among the world's most diverse and productive ecosystems, providing multiple ecological and economic services to both terrestrial and marine habitats (Spalding, Kainuma, & Collins, 2010). They are located at the fertile intersection between oceans, freshwater, and land realms. Growing in the inter-tidal zone of tropical and subtropical latitudes, they stabilize the coastline, reduce erosion from extreme weather events, and improve coastal waters quality by filtering land-based pollutants before runoff reaches shallow marine habitats. Ecologically, they provide a food-rich and protected haven for many species (particularly as a nursery habitat) within their complex root systems. Mangroves provide nursery habitat for economically important fisheries as well as migrating birds and other wildlife. Mangrove forests are particularly important in Central America because the region is highly vulnerable to extreme weather events such as storms, floods, and landslides (UNEP, 2010b). In addition, mangrove management is an important component of both climate change mitigation and adaptation efforts.

There has been a considerable loss of mangrove areas globally since the 1980s, with recent studies indicating that the remaining area may be less than originally thought (FAO, 2007; Giri et al., 2011). Mangroves are under considerable deforestation and degradation pressures because they not only meet the household needs of local communities for fuelwood and timber, but also compete with other high-value activities such as tourism development, agricultural production, aquaculture, and transportation infrastructure.

In addition to the detrimental effects the loss of mangroves has on livelihoods, protection against disasters, and biodiversity, deforestation in mangrove forests has a disproportionate role in contributing to greenhouse gas emissions: although they only compose 0.7 percent of tropical forest, they contribute to 10 percent of global deforestation emissions (Donato et al., 2011; Siiikamãki, Sanchirico, & Jardine, 2012). The role of "blue carbon" habitats (mangroves, salt marshes, seagrasses, and seaweed) in capturing carbon has largely been overlooked in climate change mitigation programs.

In recent years, however, it has become clear that mangroves hold enormous pools of carbon, not only in their woody biomass but particularly in the soils composed of leaf litter. Moreover, they sequester carbon at significantly higher rates per unit area than terrestrial forests (Mcleod et al., 2011). Much of this carbon is sequestered in the soil below ground (unlike terrestrial ecosystems), remaining there for very long periods of time (Pendleton et al., 2012). There is growing recognition that carbon sequestration in mangrove and other coastal habitats may be particularly important in efforts to mitigate greenhouse gas emissions (Alongi, 2012). Therefore, the move to slow down the loss of blue carbon habitats has garnered considerable global interest within international discussions on reducing emissions from deforestation and forest degradation (REDD+).

There is limited knowledge about the ecosystem services that mangroves provide within Central America (Scodanibbio, 2013). This leads to insufficient understanding of the root causes behind land use planning processes and destruction of mangroves. The fact that the loss of mangroves takes place in areas with high poverty levels and few options for establishing sustainable livelihoods, or in protected areas with insufficient resources for their protection, has made it difficult to improve mangrove conditions. Reversing the trend of degradation of coastal habitats requires understanding the marine and terrestrial tenure and governance practices at work within mangrove forests. Because mangroves are a crucial part of the intertidal zone that bridges terrestrial and marine ecologies, tenure systems that

govern access and use of mangrove forests tend to be relatively unique and complex in any given national context. For example, though they are forests, mangroves can come under the jurisdiction of other ministries (such as fisheries) outside of the national forest department. It is not unusual to find that an overlapping set of tenure rights exist on the ground: mangrove forests can be under the formal management of the state with customary use rights held by local communities; at times, large concessions can be given to tourism or aquaculture interests. Managing mangroves, therefore, requires clarifying and strengthening tenure and its governance to establish an enabling framework for sustainable forest management in mangrove habitats. Identifying effective types of tenure and governance arrangements, such as community-based or co-management, will be an important step in sustainable mangrove management. Coupled with the development of appropriate carbon accounting methods in blue carbon habitats, it will be possible to build REDD+ initiatives in coastal zones.

This report examines the land and resource tenure regimes within the mangrove systems of three countries in Central America (Guatemala, Honduras, and Panama) which fall under the coastal marine systems of the Pacific Ocean and the Caribbean (Figure 1). This assessment, based on a desk review, is designed to inform interventions that the United States Agency for International Development (USAID) developed through the Regional Climate Change Program. It aims to complement the findings of country-specific reports on land tenure and REDD+ for Guatemala, Honduras, and Panama that cover issues related to land and resource rights, incentive programs, rights to participate in decision making, as well as rights to own and transfer carbon[1].

FIGURE 1: MANGROVE AREAS IN CENTRAL AMERICAN COUNTRIES

Source: Spalding, Kainuma, & Collins, 2010

[1] The three assessments are: Kuper, J. (2014). *Guatemala resource tenure and sustainable landscapes assessment.* Washington, DC: USAID Tenure and Global Climate Change Program; Recio, M. E. (2016). *Honduras resource tenure and sustainable landscapes assessment.* Washington, DC: USAID Tenure and Global Climate Change Program; Recio, M. E. (2014). *Panama resource tenure and sustainable landscapes assessment.* Washington, DC: USAID Tenure and Global Climate Change Program.

Among these three countries, Panama has by far the largest area under mangroves (Table 1). Panama and Honduras are among the five countries with the largest changes in mangrove forest area in the region. In Panama and Honduras, the shrimp and salt production industries are the prime drivers behind these changes. Conversion of mangrove forests to livestock grazing areas, and urban and tourism development are the other major causes of forest loss. Although there have been small attempts at rehabilitation, overall there has been insufficient protection for these biodiverse areas. Panama's mangroves, in addition, are under significant threat from oil pollution due to the high maritime traffic in the Panama Canal.

TABLE 1: STATUS AND TRENDS IN MANGROVE AREAS IN GUATEMALA, HONDURAS, AND PANAMA BASED ON FAO ASSESSMENTS

Country	Most Recent Reliable Estimate		1980	1990	2000
	Hectares (ha)	Ref. Year	ha	ha	ha
Guatemala	17,727	1999	18,600	17,400	17,500
Honduras	78,668	2000	152,500	118,400	78,700
Panama	174,435	2000	250,000	190,400	174,400

Source: adapted from FAO, 2007, 31

In recent years, there has been growing regional interest in understanding the current challenges for sustainably managing mangrove forests in Central America after the devastating impact of Hurricane Mitch in late 1998. The United Nations Environment Programme's (UNEP) Regional Office for Latin America and the Caribbean, together with the relevant Ministries of the Environment, developed a project titled the Integrated Coastal Management with Special Emphasis on Sustainable Management of Mangrove Forests in Guatemala, Honduras, and Nicaragua Project (known as the Mangrove Project) over the period December 2010 – May 2013. It sought to carry out a limited number of diagnostic studies to support spatial and land use planning within mangrove and coastal ecosystems in these three countries (UNEP, 2010a).

In the following three chapters, each country is discussed in terms of the current status of mangroves; the legal, policy, and institutional frameworks governing resource tenure and management; its relevance to REDD+ initiatives; and, a set of recommendations for improving mangrove management. This is followed by a concluding chapter that draws together the key lessons from this assessment. More detailed analysis of the national legal frameworks around land and forest resource tenure can be found in the complementary national assessments noted above.

2.0 GUATEMALA

2.1 PRESENT STATUS OF MANGROVE FORESTS

The majority (93.4 percent) of Guatemala's 17,641 hectares (ha) of mangroves are found within the lagoons on the Pacific Coast with the primary area being near the Mexican border of Rio Ococito where the Ocós and Naranjo rivers drain into the Manchón Guamuchal wetlands (MARN & UNEP, 2013; Monterroso, 2013; Spalding, Kainuma, & Collins, 2010; Wilkie & Fortuna, 2003). Moving eastwards, the Rio Acomé estuary near the Sipacate, Monterrigo lagoons and the Rio Paz estuary also have some mangrove forests. The remaining 1,170 ha of mangroves are located on the Atlantic coast (MARN & UNEP, 2013; Monterroso, 2013). Of the country's mangroves, 27 percent are located within some type of protected area (22.7 percent for Pacific mangroves and 88 percent for Atlantic mangroves). Guatemala has four different species of mangroves, all of which appear on the National Council for Protected Areas's (CONAP's) red list of plant systems at risk of extinction. These are red mangroves (*Rhizophora mangle*), black mangroves (*Avicennia germinans*), white mangroves (*Laguncularia racemosa),* and button mangroves (*Conocarpus erectus*, of which only 60 ha remain).

Per the National Forestry Institute (INAB), one percent of Guatemala's territory is suitable for mangroves, equivalent to 108,000 ha[2], and Guatemala has lost over 70 percent of its mangroves since 1954 (MARN & UNEP, 2013). However, exact data on when these losses were incurred is difficult to establish: today's level of mangrove coverage appears to have returned to 1980 levels based on Food and Agriculture Organization (FAO) baseline data. On the other hand, the non-governmental organization (NGO) Tropico Verde puts mangrove loss at approximately 500 ha per year[3].

Much of the mangrove loss has been the result of human disturbance, including cotton production in the 1950s, agro-industry (sugar cane, oil palm, rubber and cattle), uncontrolled urbanization, tank construction to produce salt by evaporation, and shrimp aquaculture (Galvez, 2012). On the Pacific coast, villages use the mangroves for fuelwood and building materials, while the nearby waters are used for artisanal fishing and collection of wild shrimp larvae for aquaculture ponds (Spalding, Kainuma, & Collins, 2010). Sugar plantations are noted as the most serious current threat, because they indirectly involve land use change and because plantation operators block the flow of fresh water to the coast for irrigation purposes, interrupting the hydrological cycle and resulting in the die-out of the mangrove ecosystem.

2.2 OVERVIEW OF LEGAL, POLICY AND INSTITUTIONAL FRAMEWORK

The Ministry of Environment and Natural Resources (MARN) and UNEP carried out a comprehensive study of mangrove ecosystems and legislation as part of a regional mangrove project. Products of the study included a quantification of mangroves and a study of legal frameworks, actors and recommendations for reform, including a first draft of a revised INAB Mangrove Regulation (De Noack 2013; MARN & UNEP, 2013). Other large projects such as the United Nations Development Programme's (UNDP) Conservation and Sustainable Use of Biodiversity in Coastal and Marine

[2] Preamble to the Resolution regulating mangroves under the 1996 Forestry Law (INAB 01.25.98)

[3] http://www.tropicoverde.org/Proyecto_TV/proyecto_2_humedales_manglares.htm

Protected Areas (MPAs) (2014-2019) seek to increase mangrove areas in specific MPAs three-fold over the project cycle (UNDP, 2014).

2.2.1 Legal Regimes Governing Mangrove Forests

Guatemala's mangroves are covered by three main legal regimes: as state land reserves, as protected areas, and as forests. They are also subject to further regulation as hatcheries, fishing areas, and tourist areas.

The 1985 Constitution (Art. 122) defines and designates state land reserves, which includes areas 3 km inland from all coastlines, 200 m around lakes, 100 m either side of navigable rivers, and 50 m around springs and water sources, but excludes private property registered before 1956 as well as urban areas. The majority of Guatemala's mangroves are found in state land reserves and are therefore considered a public good.

Guatemala is a signatory to the Ramsar Convention and has designated three mangrove areas as wetlands of international importance (De Noack, 2013). In addition, CONAP has jurisdiction over the mangroves inside the Guatemalan System of Protected Areas. It also has an interest in mangroves more generally, since all four mangrove species are present on the list of at-risk species that CONAP is obliged to protect according to the Protected Areas Law.

The Forestry Law refers directly to mangroves, declaring that the protection, conservation, and restoration of mangroves is in the national interest and should be subject to special regulation. The current Mangrove Regulation dates from 1998. It applies to all areas with mangroves or appropriate for mangroves, giving INAB jurisdiction over mangroves outside of protected areas. INAB can license owners or legitimate possessors to harvest mangroves, can issue concessions for forest management and reforestation, and can approve forestry incentives.

Policies relevant to mangroves include:

- The 2009 Policy for the Integral Management of Guatemalan Marine Coastlines (Política para el Manejo Integral de las Zonas Marino Costeras de Guatemala), under which marine coastline ecoystems and their water basins should be protected, managed, and used in such a way as to guarantee their permanence and real benefits as well as result in an increase in quality of life for the population, especially the local population;
- The 2006 Guatemalan National Wetlands Policy (Política Nacional de Humedales de Guatemala) includes mangroves as areas that should be preserved and managed for the benefit of the current and future Guatemalan population; and,
- The 2011 Biodiversity Policy (Política de Diversidad Biológica) includes mangroves among the ecosystems whose health should be promoted.

2.2.2 Institutional Framework

Different institutions have jurisdiction over each of the legal regimes that apply to mangroves. The Office of Control of State Reserve Areas (OCRET), INAB, and CONAP are each represented by decentralized regional offices (Table 3).

TABLE 3: MAIN STATE INSTITUTIONS WITH JURISDICTION OVER MANGROVES

Institution	Legal Basis	Jurisdiction Over	Focus
OCRET	• 1985 Constitution • 2007 Decree 126	• Mangroves as state land reserves	• Land cadaster and rental

INAB	• 1996 Forestry Law • 1998 INAB Mangrove Regulation	• Mangroves as forest	• Forest management • Licenses for exploitation, concessions for reforestation
CONAP	• 1989 Protected Areas Law • Manual for Forestry Administration in protected areas	• Protected areas including mangroves; and • Mangroves as at-risk plant systems	• Conservation within protected areas
Municipalities	• 2002 Municipal Code	• Municipal territory including mangroves	• Licensing activities • Land-use planning
Office of Fishing and Aquaculture Regulation	• 2002 Fishing and Aquaculture Law • 2005 Ministry of Agriculture and Livestock (MAGA) Fishing and Aquaculture Regulation	• Hatcheries and hydro-biological ecosystems including mangroves	• Prohibition on fishing in hatcheries and on polluting coastlines
Guatemalan Tourism Institute	• 1967 General Law of the Guatemalan Tourism Institute	• Coastlines as actual or potential areas for tourism	• Development of tourist attractions

Other actors include the Coordination of Guatemalan Communities for the Defense of Life and Mangroves (COGMANGLAR), community development councils, community associations, fishing cooperatives, and NGO co-administrators of protected areas, like the Foundation for Eco-Development and Conservation (De Noack, 2013).

2.2.3 Tenure and the Management of Mangrove Forests

According to the Director of Rafael Landivar University Institute of Agriculture, Natural Resources, and Environment (URL-IARNA), Juventino Galvez (2012), the entire system of administration of state land reserves needs to be overhauled, which would include mangrove ecosystems. He writes that state land reserves have strategic value along four dimensions – environmental, security, socio-economic and culture/recreation – but that the current law, Decree 126 of 1997, deals with none of them, limiting itself to operational issues like cadastral upkeep, rental properties, and zoning. Furthermore, limited resources and a lack of institutional authority mean that OCRET has not been able to manage those well, leading it for example to use rental contracts as a method of raising operating revenue rather than to further increase the strategic value of state land reserves.

Galvez cites a litany of consequences including not only environmental degradation but also poor public service provision, large areas outside of state control with presence of illegal activities, and privatization to the point where most ordinary Guatemalans are excluded from state land reserves. Municipalities have filled this institutional vacuum, often administering land in a commercial or corrupt manner (Galvez, 2012).

OCRET is estimated to have regularized the rental/concession situation of only 8,100 properties – or roughly 10 percent of the area under its control (Galvez, 2012). Slow progress on cadastral development and regularization means that there is no information available on the current tenure situation in state land reserves and therefore over mangroves within the reserves. Though there are some examples of communities with rental agreements over mangroves, generally speaking power

asymmetries and the opacity of the land rental procedure means that communities have been marginalized.

The lack of integration of the legal regimes relating to mangroves has several other consequences, including:

- Rentals of state land reserves by OCRET are not conditional on protecting existing mangroves or restoring mangroves on appropriate land; and,
- INAB's Mangrove Regulation refers to "owners" and "legitimate possessors" of land rather than "owners" and "tenants," the tenure categories in State Land Reserves under Decree 126 of 1997.

2.3 REDD+ AND MANGROVE MANAGEMENT

The Guatemala Readiness Preparation Plan makes no mention of the potential for REDD+ in mangroves, though it does mention COGMANGLAR as a participating civil society organization. As a member of Red Manglar Internacional, however, COGMANGLAR is publically opposed to REDD+.

On the Atlantic coast, what little mangrove remains falls largely within the REDD+ Caribbean Early Initiative project area (particularly in Cerro San Gil and Rio Sarstún). Mangrove protection and restoration are included in the planned project activities. There is no planned REDD+ Early Initiative on the Pacific coast. Since the Pacific coast is not an area prioritized by the Emission Reductions Program in the medium term, it will not have an established sub-national reference level.

2.4 RECOMMENDATIONS FOR IMPROVING MANGROVE MANAGEMENT

The very little mangrove that remains in Guatemala is still under threat. The absolute priority must be to prevent further loss of mangrove and to restore degraded mangrove ecosystems. Opportunities include:

Consider possible REDD+ strategies for mangroves in the Pacific and begin early dialogues on them.

Options for REDD+ in the Pacific mangroves include an Early Initiative or the expansion of forestry incentives. Even if these are not made part of the Emission Reduction Program, they could still be included in the national Deforestation Reduction Strategy.

In light of the reservations expressed by COGMANGLAR, INAB should carry out prior consultations even if all it intends to do is expand the coverage of its forestry incentives in mangroves. This will be particularly important to build community-based management approaches that strengthen the engagement of local communities and secure their rights in mangrove areas.

Complement the Mangrove Regulation with an inter-institutional agreement.

The Mangrove Regulation will be passed by INAB and it derives its authority from the Forestry Law. It will therefore not bind other actors directly and therefore could benefit from being backed up by an inter-institutional agreement at the national or regional level, which fleshes out each actor's role.

Improve monitoring, complaints reception, and control of mangroves.

Legislative reform is desirable to clarify competencies and harmonize the different legal regimes that apply to mangroves. The existing legal framework contains unequivocal legal protections for mangroves. For example:

- The Protected Areas law prohibits extraction from mangroves and the Forestry Law protects them from land use change;
- Under the Protected Areas Law, coastlines should fall under a conservation-oriented management approach; and,
- Under the Forestry Law, all areas of state land reserves administered by OCRET appropriate for mangrove should be declared as a protected area or dedicated to mangrove plantation or management.

More needs to be done to make these existing protections effective, including by increasing monitoring, responsiveness to complaints, and enforcement. For example, no rivers on the Pacific coast have yet been declared navigable by OCRET, which would result in their banks being declared state reserve lands, even though some plainly are.

Begin work on a dedicated mangrove law.

Art. 35 of the 1996 Forestry Law makes developing a dedicated mangrove law a binding obligation. INAB should lead the process in close coordination with MARN, CONAP, MAGA, INAB, and OCRET, as well as the participation of other interested stakeholders. This law could:

- Apply an ecosystem approach to mangrove management and restoration, including protecting mangroves from pollution and protecting the fresh water supply for mangroves, as well as ensuring that offshore management is effectively integrated;
- Clarify institutional competencies;
- Improve monitoring, complaints handling and enforcement; and,
- Fully integrate mangrove protection, management, and restoration with OCRET's administration of land rental and concessions as well as INAB's forestry incentive programs.

Begin work on a new state land reserves law.

It will be difficult to reverse the decline in the condition of mangrove ecosystems without addressing them within the broader context of state land reserves administration. Such a law could provide a more comprehensive approach to the administration of state land reserves and give OCRET the resources and authority within the executive branch of government needed to work effectively.

3.0 HONDURAS

3.1 PRESENT STATUS OF MANGROVE FORESTS

There are extensive mangrove areas to be found on both the Caribbean and Pacific coasts of Honduras (Wilkie & Fortuna, 2003). Mangrove forests include black mangroves (*Avicennia bicolor & Avicennia germinans),* buttonwood mangroves *(Conocarpus erectus),* white mangrove *(Laguncularia racemosa),* and red mangrove *(Rhizophora mangle).* Mangroves are found within twelve protected areas. Along Honduras's Caribbean coast, mangroves can be found both in lagoons as well as estuaries (Spalding, Kainuma, & Collins, 2010). The southern areas of the offshore Bay Islands also have mangroves. On the Pacific coast, there are large mangrove areas in the sheltered Gulf of Fonseca. According to the Forest Statistics Yearbook (National Institute of Forest Conservation and Development, Protected Areas and Wildlife [ICF], 2011), mangroves cover an estimated surface area of 130,894 ha in Honduras's southern zone (48,584 ha in Choluteca and Valle) and Gracias a Dios (40,880 ha). There are also mangrove forests in Atlantida Department (13,480 ha), Colon (17,659 ha), Cortés (5,656 ha), and the Bahia Islands (4,635 ha).

Though they cover only 1.1 percent of national territory, mangroves are highly affected by different industries, in particular shrimp farming as well as the extraction of kindling and wood for a variety of uses. Mangrove forests in Honduras are important as they supply basic forest resources for those with limited income, but are under competitive pressures since they are valued for industrial activities. Mangrove forest areas have been substantially reduced by the expansion of shrimp farming, especially in the Gulf of Fonseca. In contrast, the Bahia Islands coastline has been degraded by expanding urban development for tourism (Chi Ham s.f.). The devastating impact of Hurricane Mitch in 1998 has brought significant attention to the role of mangroves in disaster risk reduction leading to a series of integrated coastal management projects (Spalding, Kainuma, & Collins, 2010). Nearly all the mangroves in the Bay Islands (especially on Guanaja Island) were destroyed by this hurricane. Recruitment or recovery of mangrove areas has been very difficult leading to subsidence of remaining sediment and breakdown of mangrove peat, demonstrating the significant challenges, costs and uncertainties associated with mangrove restoration. New projects such as the Conservation of Mangrove Ecosystems and Sustainable Livelihoods for Coastal Communities, 2015-2018 Project, funded by the Inter-American Development Bank, seek to strengthen knowledge systems to support policy development and management tools, including field guidelines for community monitoring and management that promote social inclusiveness.

3.2 OVERVIEW OF LEGAL, POLICY AND INSTITUTIONAL FRAMEWORK

3.2.1 Legal Regimes Governing Mangrove Forests

From the environmental point of view, the General Environmental Law of 1993 establishes that mangrove forests and other marine coastal resources are a fundamental part of sustainable development. It therefore underscores the need to account for their ability to regenerate in the planning of their use and exploitation.

As a forest ecosystem, the law covering forestry, PA, and wildlife domains provide a legal definition for mangrove swamps, establishing that, among forest areas, it is considered "land associated with brackish, fresh or marine bodies of water, with mangrove swamps or other species with similar characteristics that grow in wetlands" (Art. 4 of 2008 Forest, Protected Areas and Wildlife Law).

With respect to the exploitation of wetland resources, the Fishing Law establishes prohibitions and fines for persons who degrade mangrove forests and other places that serve as a refuge and provide habitat. Additionally, the law bans harvesting of several species that use mangroves as habitat, and includes several technical regulations linked to the exploitation of resources within mangroves.

Several international treaties on mangroves are also applicable and are binding upon the entire country. Among these, the most important treaties are the Ramsar Convention and the Convention on International Trade in Endangered Species of Wild Flora and Fauna.

3.2.2 Institutional Framework

Table 4 identifies the key institutional actors within the Honduran forestry and environmental sector in terms of mangrove management. Likewise, there are environmental NGOs whose specialty is the defense of mangroves. There are also different private companies active in mangroves, some of whom operate with sustainable development goals. The following table introduces these entities.

TABLE 4: PRINCIPAL INSTITUTIONS AND ORGANIZATIONS WITH ADMINISTRATIVE ROLES IN THE MANGROVE FORESTS

Entity	Coverage	Functions in the Mangrove Forests
Governmental institutions		
National Institute of Forest Conservation and Development, Protected Areas and Wildlife (ICF)	National, with regional offices that act at the field level	Granting permits for the exploitation of resources from mangroves. Supervision and assessment of compliance with management plans in both productive and conservation mangrove areas. Supervision and technical and socio-environmental audits. Zone demarcation.
Agriculture and Livestock Department	National, with regional offices. In this aspect, it acts through the General Fishing and Aquaculture Department.	Establishing procedures and requirements for fishing activity. Fixing banning seasons and reserve zones; exercising controls and imposing fines. Granting sports, artisan, and industrial fishing permits.
Natural Resources and Environment Department (SERNA)	National	Demarcating certain marine and coastal areas, subjecting them to regulatory and management plans. Control and follow up mitigation measures contained in environmental licenses.
Tourism Department /Honduran Tourism Institute	National	Coordinating the National Ecotourism Strategy.
Armed Forces of Honduras	National	Patrolling the zone for the inspections and controls to prevent damage to the resource.
Municipalities	Local	Protecting the municipal ecosystem and the environment. Rationalizing the use and exploitation of the municipal resources. Granting resource exploitation permits and receiving taxes in respect of same.
Non-governmental organizations and private companies		
Committee for the	Regional and local	Co-administrator of ten Ramsar wetland sites.

Defense and Development of Flora and Fauna in the Gulf of Fonseca		Administer resources for the defense and conservation of wetlands in the Southern zone of Honduras. Participate in projects that carry out mangrove swamp protection actions.
National Association of Aquaculture of Honduras	Regional	Bring together producers, processers and exporters of inputs and aquaculture services, with greater presence in the Southern zone of the country where there are shrimp farms. Involvement in mangrove conservation actions (bans, projects, supporting the competent governmental entities and non-governmental organizations).
Bay Islands Conservation Association	Regional and local	Coordinate efforts to protect the natural resources of the Bahia Islands, which are all located in wetland ecosystems. Collaborate with the ICF and SERNA in the control and follow-up of management plans, especially in the protected areas of the Bahia Islands.
Federations of Indigenous and Afro-Honduran peoples	Regional and local	Implement projects on land belonging to ethnic groups where there are mangrove forests or wetlands. Support fishing activities for marine-coastal species for subsistence and sale to entrepreneurs.

Within the institutional framework, it is noteworthy that the most important actions for the defense and conservation of mangrove swamps have been carried out through individual programs and projects, as opposed to government-sponsored efforts. Among these are the Gulf of Fonseca Mangrove Forest Management and Conservation Project (Promangle), as well as the integrated Mangrove Forest Management Project in the coastal zones in Guatemala, Honduras, and Nicaragua. Following Hurricane Mitch there were a number of action research activities to understand the constraints to successful mangrove restoration, particularly in the context of reducing coastal erosion.

Promangle has publicized its intention to measure the levels of carbon in the mangrove forests in the bays of Chismuyo, San Lorenzo, and San Bernardo in the south of Honduras (IPS, 2013). Likewise, within the framework of the Mangrove Project, UNEP is working jointly with the Natural Resources and Environmental Department on an economic assessment of the ecosystem services of the National Jeannette Kawas National Park (Proyecto Manglares, 2013).

3.2.3 Tenure and the Management of Mangrove Forests

Three types of land tenure (national, communal, and private) exist within mangrove areas; even within these tenure types, there are different types of possession or administration (such as co-investment, leasing, and usufruct). Although there is no recent data on land tenure in the mangrove forest areas at the national level, using studies based on mangroves in the southern zone, it appears that the predominant ownership regime is private, followed by national. A study carried out in the southern zone reported the following tenure data: private 71 percent, national 12.4 percent, under lease 9.2 percent, and other types 2 percent (Proarca-Costas, 2001). At the same time, there is little information on the de facto use of mangrove forests through customary practices of coastal communities in relation to the legal status of mangrove forested areas.

The principal tenure conflicts in the mangrove forest zones involve contested resource use, which varies in the different zones of Honduras. The following are the most important conflicts in mangrove forest zones:

1. Hoarding of areas of mangrove forest for use in agro-industrial activities, such as shrimp farming, African palm, and livestock;

2. Failure to adhere to the conservation guidelines within the protected areas and Ramsar sites in the country;
3. Conflicts between landowners and rural people regarding shrimp farms and other productive activities in the southern zone;
4. Problems between communities over access rights and depletion of fish stock in certain areas of the Atlantic and island zones;
5. Entitlements granted without due process in mangrove forest areas; and,
6. Reduction in the tourism potential of some zones because of unsustainable human activities.

In addition to the above, the main constraints on mangrove forest management are set out in decrees creating protected areas for the conservation of this ecosystem, most which fall within the category of Ramsar sites. Most of these are limitations or prohibitions on the use of land for certain specific activities. Permitted activities may only be undertaken by obtaining administrative permits, the procedures for which are generally complicated and often not followed. Activities that constitute a punishable infringement according to forest and environmental legislation very frequently remain without sanction, because, for a variety of reasons, the system is incapable of enforcing the penalties.

3.3 REDD+ AND MANGROVE MANAGEMENT

Although mangrove forests form an extremely fragile ecosystem and are subjected to strong pressure by anthropogenic, domestic, and industrial activities, there is no evidence that they receive any special attention in Honduras. This is the case despite the devastating negative impact of Hurricane Mitch in 1998. Examples of current threats that are poorly understood in Honduras include the extraction of firewood and other wood for construction in the southern zone; unsustainable fishing; the expansion of the urban surface area in the Bahia Islands, which results in the production of waste and other residues that end up in the mangrove swamps; and, pressure exerted by the shrimp farming industry in the southern zone and La Mosquitia, and by tourism and fishing within the Bahia Islands.

Mangrove forests and wetlands are not referred to in the Honduran REDD+ Strategy Proposal (Readiness Preparation Proposal [R-PP] draft of November 2012), except in the contextual discussion, which mentions that the mangrove swamps and the mixed forests cover 550,000 ha, as part of the forests that form 8.4 percent of Honduras's woodland surface area.

3.4 RECOMMENDATIONS FOR IMPROVING MANGROVE MANAGEMENT

Build capacity and resources of competent governmental entities.

From an institutional perspective, efforts should be made to ensure that the competent governmental entities have sufficient resources and the necessary capacity to be able to adequately manage this ecosystem, ensuring that economic activities do not undermine environmental and social safeguards. The competent administrative authorities must ensure that environmental licenses and administrative permits for economic activities in mangrove areas are preceded by studies that ensure the conservation of the ecosystem, and refrain from granting licenses and permits in cases of doubt. Co-management opportunities exist within the Honduran legal framework; there is a need to test, apply, and enforce these opportunities through pilot activities. Nevertheless, the challenge of larger-scale adoption will remain, particularly if incentive programs and enforcement of natural resource laws remain limited.

Establish parameters for the management of mangroves alongside REDD+ activities.

Within the framework of the National REDD+ Strategy, parameters for the management of mangroves should be established to link actions and guidelines with national and sectoral policies so that they are in accordance with international actions that seek protection of mangroves and wetlands. In particular, it is desirable to validate existing research initiatives for the assessment of carbon in mangroves, accompanied by studies of appropriate reforestation techniques, particularly around species capable of rehabilitating degraded areas. It is surprising that given the high carbon stocks of coastal forests that Honduras does not consider mangroves more explicitly in its REDD+ activities.

Harmonize and clarify the diversity of laws and institutions related to land tenure.

As with the broader forest estate in Honduras, there are a diversity of laws and institutions with responsibilities related to land tenure and resource management. While mangroves may have a slightly more complex institutional arrangement with different actors (fisheries and tourism), the general focus on coordination in licensing and enforcement responsibilities is equally relevant to mangrove forests, as inland forests.

Address conflicts that cause loss or degradation of mangroves through consultation.

These activities include grabbing of wetlands for unsustainable activities, granting entitlements in mangrove swamp areas, and failing to adhere to the limitations established in protected areas categorized as Ramsar sites in Honduras. To date Honduras has had significant challenges in building participatory processes that integrate the few large landholders, industry, and local stakeholders, including indigenous groups. There is a need to promote the participation of representatives of infrastructure, tourism, energy, and aquaculture sectors alongside local community consultation associated with REDD+ implementation. Specifically, the consultation processes associated with the Strategic Environmental and Social Assessments under REDD+ implementation could provide a useful form for launching these types of participatory consultations. Unfortunately, Honduras's REDD+ process has moved particularly slow in comparison to neighboring countries.

While conflicts represent a major barrier to REDD+ implementation, it will be important to mix efforts to build consultation and engage in conflict resolution with efforts in areas of low conflict where proof of concept can be demonstrated. REDD+ and forest conservation efforts should seek not to exacerbate existing social conflicts as an underlying principle of implementation.

Seek compliance with international treaties which cover the protection of mangrove forests.

From the legal point of view, compliance with the international treaties covering the protection of mangrove forests should be pursued. Part of this is follow-up to ensure that the sites registered under the Ramsar Convention are in line with the rational use and sustainable development parameters, as described in the respective management plan. At the national level, efforts should be made for the formulation of fully differentiated regulations for mangrove areas in accordance with the particular characteristics of the ecosystem.

4.0 PANAMA

4.1 PRESENT STATUS OF MANGROVE FORESTS

With extensive coastlines and high rainfall, Panama has extensive mangrove forests (Spalding, Kainuma, & Collins, 2010) and is home to ten of the 11 mangrove species found in North and Central America. Panama's mangrove areas are present along the Pacific coast with red mangroves (Rhizophora mangle) being the most prevalent followed by tea mangrove (*Pelliciera rhizophora*) and the rare *Mora oleifera* (Wilkie & Fortuna, 2003). These stands can often be between 25 to 40 meters in height. The largest forests can be found on the southern coast which experiences high tidal range (up to 6 m) and has numerous rivers. The northern Atlantic coast, with a narrower tidal range, has smaller mangrove areas.

According to national studies from 2007, Panama had mangrove coverage equal to 181,300 ha; 164,900 ha of which are found on the Pacific coast and 16,300 ha on the Caribbean (Centro del Agua para el Trópico Húmedo de América Latina y el Caribe 2008). Official information provided by the National Environment Authority (ANAM), however, estimated in the *Inventory of Continental and Coastal Wetlands of Panama* (ANAM, 2010) that mangroves cover a total of 174,400 ha and comprise approximately 2.31 percent of Panama's total surface area. Although Panama has the largest mangrove area among the three countries, its coverage has gradually declined. FAO's forest assessment data indicates that from 250,000 ha in 1980, it had dropped to 170,000 ha in 2005 (FAO, 2007). This dramatic drop of approximately 80,000 ha between 1980 and 2005 is primarily attributable to increased shrimp farming, salt flats, grazing pastures, and urban and tourism development. Pollution is also a problem within the Canal Zone: oil spills in 1968 and 1986 led to considerable loss of mangroves (Spalding, Kainuma, & Collins, 2010).

TABLE 5: TOTAL MANGROVE AREAS BY LOCATION

Location	Surface Area (ha)
Pacific Coast	
Gulf of Chiriquí	50,133
Coiba Island	1,445
Gulf of Montijo	20,910
Southern end of the Azuero Peninsula	4,083
Gulf of Panama	56,877
Gulf of San Miguel	30,812
Piña and Jaqué Bay	694
Caribbean	
Colón and the Arriba Coast	1,541
Kuna Yala	3,017
Laguna de Chiriquí	11,824

Between 2007 and 2010, mangrove forest cover was estimated to have been further reduced by about 6,900 ha (ANAM, 2010). Unfortunately, the estimates for mangrove coverage in Panama are not easily comparable as they include consideration of Panama's islands to varying degrees. For example, for the protected area of Coiba island, the 2009 Management Plan indicates total mangrove coverage of 1,400 ha (ANAM 2009), showing that rather than diminishing, the mangroves in the islands have been maintained, and even slightly increased, as compared to the data from 2007.

Mangrove forests, even if under protection, are subjected to intense pressure, primarily from unsustainable production practices, expansion of the agricultural frontier, unplanned tourism, real estate developments and environmental pollution, particularly around the Panama Canal area. Local residents exploit mangroves as sources for shrimp larvae as well as use mangroves for

firewood and charcoal production or to extract tannins for local industry. Furthermore, the mangroves are important for fishing activities.

Even though most mangrove ecosystems are sparsely populated, there are human settlements surrounding these areas.

4.2 OVERVIEW OF LEGAL, POLICY AND INSTITUTIONAL FRAMEWORK

Most mangroves in Panama are located within protected areas or in specially managed coastal/marine areas. Though land titles cannot be granted in mangrove areas and those areas are exempt from private possession (Article 258, National Constitution), there are several land disputes being waged over mangrove areas, including concessions that have been granted for tourism or real estate development.

4.2.1 Legal Regimes Governing Mangrove Forests

Mangroves are considered a marine/coastal resource (Law 44, Article 2, dated 2006), as well as a national asset. Their use, management, and conservation are regulated by the National Authority for Aquatic Resources (ARAP), except for mangroves within protected areas, which fall under ANAM's jurisdiction (Article 67). Mangrove ecosystems are defined as "forests comprised of a limited number of species located on the very edges of dry land and heavily influenced by tides that provide the ecosystem with an influx of salt water" (Resolution AG-0491-2006, Article 2).

Article 296 of the Panamanian Constitution spells out the importance of forests. According to national forestry regulations, mangroves are considered protected forests (Law 1, Article 5.5 dated 1994) because, among other ecosystem services, they contribute to the regulation of water systems, protection of population livelihoods, agricultural crops, and infrastructure projects, prevention of erosion and wind damage, as well as provision of sheltering and protection to wildlife species.

The use and conservation of mangroves found in protected areas falls under the regulations that originally created the respective protected area, and as described in the Management Plan (Resolution AG-0491-2006, Article 20), if one is in place. If there is none, the area is governed by the regulations for the establishment of protected areas.

Some efforts have been undertaken by local governments to protect mangroves. There are at least ten cases pertaining to local governments through which specific municipalities have declared mangrove areas in their respective jurisdictions as areas of social interest. In some instances, municipalities have even declared them to be protected areas.

The different institutions that have management rights over mangroves also presents challenges. Despite the fact that the applicable regulations seek to provide for integrated management of mangrove areas, the management divide of these ecosystems along jurisdictional lines between ANAM and ARAP presents a challenge for institutional cooperation and joint management. The mangroves located in protected areas are managed by ANAM, but those outside protected areas are managed independently by ARAP.

4.2.4 Institutional Framework

Different institutions have jurisdiction over each of the legal regimes that apply to mangroves. The mangroves located in protected areas are managed by ANAM, but those outside protected areas are managed independently by ARAP.

TABLE 6: KEY INSTITUTIONS AND ORGANIZATIONS THAT PLAY A ROLE IN MANGROVE MANAGEMENT AND PROJECTS

Entity	Coverage	Duties Applicable to Mangroves
Government Agencies		
ANAM	National, with regional offices at territorial levels	Jurisdiction over mangrove ecosystems within protected areas.
ARAP	National, with regional offices	Jurisdiction over mangrove ecosystems located outside designated protected areas. Evaluation and development of policies, plans, programs and projects regarding the marine/coastal aquatic sector. Set up procedures and requirements for fishing licenses, bans, special management areas, oversight and fines, sport fishing, industrial and personal fishing licenses.
Panama Tourism Authority	National	Promote domestic tourism, as well as address issues pertaining to construction and maintenance of recreational areas.
Ministry of Agricultural and Livestock Development	National	Ensure food security nationwide and contribute to the reduction of basic cost-of-living expenses with increases in the quality of life among rural inhabitants through an agricultural sector that is competitive, participatory and sustainable, while ensuring the wellbeing of both the farmer and the community at large.
Municipal governments	Local	Apply zoning regulations and approve construction projects based on zoning requirements. Establish protected areas.
NGOs and Organized Communities		
Audubon Foundation	Regional and local	Mangrove, wetlands, pastures and flood plain conservation; awareness campaigns and environmental education on the importance of wetlands within the Bay of Panama.
Conservation International	Regional and local	Conservation projects and sustainable management of mangroves in various parts of Panama (Chiriqui and Las Perlas Archipelago).
Marviva	Regional and local	Promote conservation and sustainable use of marine and coastal resources in the Eastern Pacific.
Wetlands International	Regional and local	Work to achieve conservation and rational use of wetlands as a contribution to sustainable development.
Smithsonian Tropical Research Institute	Regional and local	Research station in Bocas del Toro, including mangrove areas. Research station in the Galeta Point protected area, including mangroves.
Asociación Nacional para la Conservación de la Naturaleza	Regional and local	Works in several protected areas in Panama and established the Patiño Point Natural Reserve as the first natural private reserve in the country. The area shelters mangrove areas representing about 10 percent of those forests on Panama´s Pacific coast. The reserve is acknowledged by Ramsar as one of the most important coastal and marine areas on the planet.
PANAMANGLAR	Regional	Joint activity among several organizations seeking to protect Panama's wetlands.

		Their key objective is to raise awareness regarding the role played by wetlands for the environment and for human lives while encouraging people to support and take action through activities that focus on maintaining this important resource.
Grupo Defensores Unidos del Manglar de Sajalices	Local	Project on sustainable mangrove use.
Association of Friends and Neighbors of the Coast and Nature	Local	Develop conservation and ecosystem protection activities, including the species found in the San San Pond Sak wetlands, by designing programs to improve the quality of life of local residents through productive activities that are environmentally compatible and promoting changes in attitudes to protect the biosystems in the area.
International Tropical Timber Organization	International	Funding efforts to conserve and reforest mangroves on the Pacific coast.
Natura Foundation	Regional	Administer conservation funds and projects.

4.2.5 Tenure and the Management of Mangroves

In legal terms, the Panamanian Constitution makes no specific reference to who owns mangroves, although it does indicate that shorelines and estuaries are for public use and are a state asset, forbidden from becoming private property (Article 258 of the Constitution). Furthermore, it states that "any land flooded at high tide, regardless of whether they are mangroves cannot be granted as property" (Fiscal Code, Article 116, item 3) and land title is forbidden in mangrove areas (Law 80 dated 2009, Article 10). Most recent legislation regulates land titles in coastal and island areas and establishes that "mangroves, (…) protected areas or any other territory subject to legal restrictions for private property" will not be the object of land titling. Simultaneously, however, it also foresees that land can be the subject of concessions by the Executive Branch for exploitation (Fiscal Code, Article 122).

Exploitation of mangrove resources (use, harvesting, and trade) in island areas is forbidden, except for tourism development (Law 2, dated 2006, Article 22). Extensive tourism development in Panama in recent years has given rise to increased harvesting and degradation of mangroves. It appears that the legal framework provides for a restricted exploitation and use of mangroves, yet clearly permits that they can be the object of long-term state concessions, which arguably, in practice, can have similar consequences to granting them as property.

National regulations provide that mangrove areas are solely for public use and are the property of the state. These provisions seem to contribute to protecting mangrove areas. Nevertheless, a significant percentage of these areas are given under concession by the state, and therefore are subject to uses that are not entirely in accordance with their protection, often causing permanent damage to the areas. Moreover, it is often the case that local populations located in the vicinity do not have formal title to make use of resources in these areas, but informally they make use of mangrove resources for either subsistence or exploitation. These situations together bring relevant conflicts pertaining to land tenure (formal and informal) of mangrove ecosystems and their use. In most cases, these uses are incompatible with the preservation of the ecological traits of these areas and, therefore, result in their degradation. Conflicts range in scale, but notably entail conflicting uses of mangroves in relation to:

1. Exploitation of mangrove ecosystems to obtain firewood, lumber, and charcoal;
2. Deforestation in mangrove areas for shrimp farming, livestock, and agricultural activities;

3. Urban and tourism development in mangrove areas or construction/operation that directly affects mangroves (altering the flow of water or input or causing pressure from pollution or degradation of the areas);

4. Occupied lands, either with property title or rights of possession within mangrove areas, lacking regulations on use and enabling unsustainable long-term use of the area; and,

5. Agricultural activity by communities residing in the areas of influence; although the communities do not actually lie within mangroves, their subsistence or economic activities are dependent on mangroves and are unsustainable, further contributing to degradation or deforestation.

4.3 REDD+ AND MANGROVE MANAGEMENT

Panama currently lacks a REDD+ strategy, although the R-PP covers research and training activities for small-scale farmers and groups of indigenous communities, and includes mangrove ecosystem protection and management. It also considers mangrove forests in developing the measuring, reporting, and verification components.

A significant portion of mangrove areas have been designated as protected areas, with instruments in place to support their protection. Although most of the mangrove systems lack management plans, there are projects designed to protect them and promote sustainable management. These are aimed to ensure that communities that rely on mangrove resources have a stake in their conservation.

In some cases, there are community projects by residents within mangrove areas. Some of them have been very successful in designing activities to sustainably use mangrove resources. For example, a community group known as Defensores Unidos del Manglar de Sajalices is implementing a project within the multiple-use mangroves protected area in the Bay of Chame. The project includes components for conservation, use, and restoration of natural resources in the protected area mangroves. The project focuses primarily on two sustainable activities. First, it addresses honey production that relies on two types of mangrove species found in the area. Second, it focuses on producing charcoal with mangrove resources using clean technology.

4.4 RECOMMENDATIONS FOR IMPROVING MANGROVE MANAGEMENT

The complementary report on land and resource tenure and REDD+ in Panama (Recio, 2014) outlines a series of recommendations that are relevant to mangrove conservation. These are presented below, followed by specific recommendations to mangrove areas. Broad recommendations include:

- Promote community management and awareness in areas adjacent to mangroves where different projects are being implemented.

- Introduce changes in law that would not allow damage of mangrove areas. Incorporate protection measures and obligations in each particular concession granted by the state over mangrove areas.

- Assess and incorporate changes in the current legal provisions to ensure that concessions are not a means to incorporate permanent changes and further degrade mangrove areas.

Mangrove-specific recommendations include:

Enhance coordination and integration of management of mangrove areas across ARAP and ANAM, as well as vis-à-vis other relevant institutions.

Jurisdictional lines between ANAM and ARAP are a challenge for institutional cooperation and joint management. REDD+ could contribute to clarify institutional competences and strengthen the

coordination functions. ANAM has a relevant role in spreading awareness on mangrove relevance among the judiciary and the relevant authorities that oversee monitoring and receiving complaints about illegal use of mangrove areas.

Provide legal certainty concerning land tenure and allowed uses in mangrove areas.

Clarify and define the mangrove areas subjected to the different legal regimes, particularly those considered as zones for special/marine coastal management, to provide further legal certainty to different actors and concerning their management. Make sure that prior to implementing any REDD+ or development project the land tenure of the area has been clarified and that the land cannot be subject to further ownership claims.

Clarify areas of shared tenure where indigenous and local populations depend on mangrove resources.

Use existing tools to deploy community development plans for adjacent areas with the purpose of incorporating a more sustainable way of living for populations nearby. Ensure that conflicting uses of mangrove areas are considered, especially when the area was granted by the state through a long-term concession. When defining management plans, take particular consideration of existing tenure situations, especially of indigenous peoples and local populations in adjacent areas. Ensuring adequate participation, as well as coordinating with traditional authorities is necessary.

Take advantage of numerous ongoing projects on mangrove areas to review lessons learned and promote community management toward REDD+ implementation.

There are several activities in place that could yield relevant data on how to manage these areas in light of carbon sequestration. Findings could be incorporated in a REDD+ mechanism. It is recommended to follow up and review lessons learned from these activities. REDD+ could contribute to finance the conservation, support, and maintenance of mangroves as an alternative or in a complementary manner to other management options. In particular, this is true for the populations dependent upon mangroves that make illegal use of the resources. Enhancing and strengthening penalties for illegal use and overexploitation of mangrove resources could contribute to this purpose.

However, it may be difficult for REDD+ to provide higher incentives for mangrove protection than the current tourist industry, particularly for the case of big tourist investments. In each particular case, a cost-benefit analysis could contribute to clarify this. Obligations restricting the use of mangroves should be considered in these cases to ensure the protection of the area under concession. Periodical monitoring of protection conditions should be encouraged and be supported by the relevant authority.

5.0 CONCLUSIONS

The extent of mangroves varies greatly between Guatemala, Honduras, and Panama, as does the inclusion of mangroves in early REDD+ actions. Particularly in Guatemala and Honduras, mangroves appear to be an afterthought in REDD+ plans. Mangroves are considered within broader wetland management obligations associated with the Ramsar Convention, though actions in support of Ramsar appear to be limited. This is important as REDD+ national strategies are likely to guide forest conservation investment in the years to come. In Panama, mangroves are considered to a greater extent, though this principally falls within protected area management discussions as opposed to considering the role of communities in managing coastal forests.

The land ownership and management regimes in the three countries differs. In Panama and Guatemala, the coastal land that mangroves cover is largely state land. In Guatemala, a portion of this state land is undergoing the long and slow process of land titling, while in Panama land title is forbidden in mangrove areas (though it does create provisions for concessions to be granted). In contrast, in Honduras, most mangroves are found on privately owned land, much of which is presumably under commercial use.

In each country, a number of national institutions have overlapping jurisdictions and roles with respect to mangrove management. In Panama, mangroves found outside of protected areas are managed by the Authority for Aquatic Resources (a marine focused institution), while in Guatemala mangroves are managed by the state land institution. These overlapping jurisdictions and difference in perspectives on whether mangroves are under the mandate of marine or terrestrial agencies create opportunity for mangroves to be forgotten. In each country, it appears that mangroves are not prioritized within national forestry departments.

In general, mangroves face similar challenges regarding tenure conflict across the three countries. In Guatemala, though the titling process protects the rights of residents, the slow pace has delayed the development of management plans. Although recently resolved, for much of the past 18 years, tenants of state land with mangrove forests were not eligible to participate in national forest incentive programs, and there was no provision preventing these tenants from clearing mangrove areas. In contrast, in Honduras conflicts have emerged between communities and private land owners around access and use, as well as to a lesser extent between land owners and government, over compliance with management constraints associated with Ramsar classifications. While compliance with Ramsar was noted in each country, enforcement and regulation capacity challenges limit the extent to which mangrove specific legislation is likely to be effective.

Looking forward, Guatemala has actively proposed regulations regarding mangrove management, though these will fall under the Forestry Law and may not be more broadly applied/recognized within other national institutions. Future programs in each country should build on opportunities to secure rights to own or use mangroves habitat (both for local users and private and public enterprises) based on efforts undertaken to protect and restore mangrove habitats. As REDD+ plans and activities develop they should be analyzed to make sure that they do not inadvertently exclude mangrove systems. Regardless, as coastal zone development continues and as coasts continue to experience the impacts of climate change, mangroves will face continued threats. Unless measures are put into place for their protection, they will be at threat because the tourism, urban expansion, and aquaculture industries rely on mangrove habitat. Unless regulations and incentive programs are developed that demonstrate the social and economic value of mangroves, it will be hard for these systems to compete with growth threats.

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