

**CONSERVATION AND WISE USE OF MANGROVE
ECOSYSTEMS: LEGISLATION IN BRAZIL, COLOMBIA,
COSTA RICA AND NICARAGUA**

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Acknowledgments

The author would like to express her gratitude to the Ramsar Convention in the person of Dr. Delmar Blasco (Secretary General), the US Department of State and the US Fish Wildlife Service for their financial support. In addition, the Carl Duisberg Gesellschaft (CDG) and the Central Placement Office (ZAV) of the Federal Ministry for Economic Co-operation of Germany for being involved in the exchange of personnel and advanced training guests between Germany and co-operating nations; to the Environmental Law Center of IUCN (IUCN-ELC), especially to Dr. Francoise Burhenne-Guilmin and Dr. Alejandro Iza for their dedicated and enthusiastic practical guidance during the fellowship program. Finally, but no less important, to her advisor Dr. Yara Schaeffer-Novelli and the Environmental Graduate Program team at the University of Sao Paulo – Brazil (Procam/USP) which represents a unique academic offering in Brazil in a interdisciplinary context for environmental lawyers.

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I. INTRODUCTION

Wetlands, including mangroves, perform several functions such as inundation control, protection from erosion, storm, floods and tidal damage, and generate goods and products such as fish and forest resources. These functions are of fundamental importance for society.¹ The high productivity of mangrove ecosystems means that they provide ample food supplies to maintain a complex food chain. They are therefore providing fertile habitats and spawning/nursery grounds for many wild species of commercial importance, including shellfish and fish.

Mangrove ecosystems' conservation is dependent upon a number of factors. One of major importance is well-designed legal and institutional frameworks. No doubt legislation can provide essential mechanisms to prevent or minimize wetlands destruction, balance competing claims to wetland resources and limit damaging and uses.

The objective of this paper is to undertake an analytical description of the national legislation of selected countries of the neo-tropical region² (Brazil, Colombia, Costa Rica and Nicaragua) related to mangrove ecosystems.³ with a view to pointing out areas of the legislation where improvements could be made towards the conservation of mangrove biodiversity. The aim is to provide information in order to suggest elements of a general framework oriented towards protecting specific wetlands ecosystems such as mangroves. Therefore, the paper does not take into account the issue of enforcement in the countries studied.

The selection of countries was made taking into consideration various factors such as their geographic location and physical features, legal systems and political regimes and membership to Ramsar Convention⁴.

The total coastal length of the studied countries is approximately 43,237 square kilometers⁵ (a) and the total area of mangrove within these countries is around 19,147

¹ Schaeffer-Novelli, Y et al, Variability of mangrove ecosystems along the Brazilian coast. In *Estuaries*, 13(2). Pp. 204-218. 1990.

² The biogeographic region of the New World that stretches southward from the Tropic of Cancer and includes southern Mexico, Central and South America and the West Indies. Source: *The American Heritage Dictionary of the English Language*, Fourth Editor. 2000.

³ It should be emphasized that references in this paper to the studied laws and countries were often made on the basis of availability. This does not imply that all legal instruments related to the issue were covered. Moreover, given the rate of change in wetland lawmaking, it is possible that some laws and regulations referred to in this paper have subsequently been amended: many times, it was not possible to obtain fully updated details of legislation. Any errors are of course the responsibility of the author alone.

⁴ The Convention on Wetlands of International Importance especially as Waterfowl Habitat was adopted in Ramsar (Iran) on 2 February 1971. It was the first globally applicable environmental convention and three decades on, is still the only treaty to address the specific requirements of one type of ecosystem. Although the Convention's title emphasizes one aspect of wetlands (as waterfowl habitat), its ambitious aim is to "stem the progressive encroachment on and loss of wetlands now and in the future" and to support wetland conservation.

square kilometers.⁶ However, the total area of mangrove forests protected within the selected countries is 4.778 square kilometers.⁷ Two countries are situated in Central America (Costa Rica and Nicaragua) and the other two in South America (Brazil and Colombia).

The four countries studied are structured conventionally with executive, legislative and judicial branches. All countries are organized by means of unitary government systems, excluding Brazil, which has a Federal Government. All follow the civil law system (statutory).

All countries are also Parties to the Convention on Wetlands (Ramsar Convention). As Parties to the Ramsar Convention, they have designated 27 sites within their territories for inclusion in the List of Wetlands of International Importance. This number could be considered small in comparison with the significant value of the wetlands found in the coastal area of Brazil, Colombia, Costa Rica and Nicaragua.

II. IMPORTANCE OF MANGROVE ECOSYSTEMS

Mangroves⁸ are salt-tolerant ecosystems situated in vulnerable areas such as estuaries, lagoons, bays and low energy beaches.

They consist of buffer zones between silt-laden freshwaters of river systems and the sea, and exemplify the interdependence of terrestrial and marine systems⁹.

For that reason, mangrove ecosystems are taken as unique coastal natural wetlands due to the fact that they promote interface between land and sea, been periodically covered by salt or brackish water due to the influence of tides.¹⁰

⁵ Coastal Statistics: Coastal Length (Km2): **Brazil** 33,379 Km2; **Colombia** 5,874 Km2; **Costa Rica** 2,069 Km2; **Nicaragua** 1,915 Km2. Note: (a) These figures should be interpreted as approximations because of the difficulty of measuring coastline length. Estimates may differ from other published sources. Source: Figures were calculated by L. Pruett and J. Cimino, unpublished data, Global Maritime Boundaries Database (Veridian-MRJ Technology Solutions, Fairfax, Virginia, January 2000).

⁶ Coastal Statistics: Mangrove Extent (Km2): **Brazil** 13,300 Km2; **Colombia** 3,659 Km2; **Costa Rica** 370 Km2; **Nicaragua** 1,718 Km2. Source: M.Spalding, F. Blasco, and C. Field (eds.), World Mangroves Atlas (International Society for Mangrove Ecosystems, Okinawa, Japan, 1997).

⁷ Coastal Statistics: area of mangrove forests protected in the selected countries: **Brazil** 3.811Km2; **Colombia** 817 Km2; **Costa Rica** 10 Km2; **Nicaragua** 140 Km2. Source: S. Iremonger, C. Ravilious, and T. Quinton, "A Statistical Analysis of Global Forest Conservation," in S. Iremonger, C. Ravilious, and T. Quinton (eds.), A Global Overview of Forest Conservation CD-ROM (World Conservation Monitoring Centre and Centre for International Forestry Research, Cambridge, U.K., 1997).

⁸Etymology: probably from Portuguese "mangue" meaning mangrove (from Spanish "mangle") + English "grove". Origin: 1613. According to the Merriam- Webster dictionary. See www.m-w.com.

⁹ The ecological services mangrove ecosystems provide are critical for maintaining surrounding ecosystems. For example, many coral reefs would not survive if adjacent mangroves did not trap sediments, and fish and crustacean populations collapse after the removal of mangroves destroys their nursery and feeding areas. Report from WWF's Conservation Assessment of Mangrove Ecosystems of Latin America and the Caribbean Workshop, Washington, D.C., USA. October 1996. Editors: David M. Olson, Eric Dinerstein, Gilberto Cintrón and Pia Iolster.

¹⁰ The IUCN Wetlands Program- an Inventory of Brazilian Wetlands- Ed. By Antonio Carlos S. Diegues. IUCN. 1994. pp. 1-22.

They provide the filtering systems and settling basins for silt brought down rivers and are the sites where salt water mixes with fresh water.¹¹

The benefits to coastal human communities from conserved mangrove ecosystems are enormous. Among several functions, they help coastal communities by reducing coastal erosion, flooding, and storm surge; dampening waves and high winds generated by tropical and subtropical storms; and perhaps lessening the ravages of tidal waves (Tsunamis) in seismically active areas.

In addition, mangroves provide opportunities for research, education, tourism development, and recreation like canoeing, bird watching, hunting, and clamming.¹² Like coral reefs, mangrove ecosystems provide no-cost, self-repairing, and natural “breakwaters”. In a similar way, mangroves help stabilize riverbanks, preventing erosion and protecting adjacent lands. Mangroves often function as silt traps, slowing the flow of silt-laden rivers and streams and enabling the particles to settle out, then afterwards holding the silt in place. In this way, they help to maintain the quality of coastal waters.

This wetland habitat provides spawning grounds and nurseries for numerous commercially valuable species such as shrimp, crabs, fishes and oysters. Moreover, mangroves export nutrients and organic detritus, which form the base of a complex food web supporting estuarine, coastal, and some offshore fisheries. The amount of mangrove wetland products from lagoons and estuaries is impressive.

These products are of direct use to people: fishes, crustaceans, shellfish, birds, mammals, reptiles, amphibians, insects, timber and wood products, fodder, clay, oyster shell etc. Mangroves are also critical feeding and resting areas for many migratory birds.

The constituent plant species (also called mangroves) share morphological, physiological, and reproductive adaptations that allow survival in very saline, waterlogged, oxygen depleted silty and unconsolidated substrates that are often subject to rapid changes.

Mangrove forest ecosystems are different from other forests in that they receive inputs of matter both the land and the sea. Mangrove forests are also referred to as tidal forests, mangrove forests, mangrove swamps or “mangal”.

Mangrove forests are areas of high biological productivity as they harbor species representative of many levels of the estuarine food chain.¹³

¹¹ Marine and Coastal Protected Areas (a Guide for Planners and Managers). 3rd. Edition. By: Rodney V. Salm and John R. Clark with Erkki Siirila. IUCN.2000.pp. 185-207.

¹² Marine and Coastal Protected Areas (a Guide for Planners and Managers). 3rd. Edition. By: Rodney V. Salm and John R. Clark with Erkki Siirila. IUCN.2000.pp. 185-207.

¹³ The IUCN Wetlands Program- an Inventory of Brazilian Wetlands- Ed. By Antonio Carlos S. Diegues. IUCN. 1994.pp. 1-22. (See *supra* n.3).

However the term “mangrove” is variously used to denote the milieu of interacting populations of plants and animals and microorganisms occupying a mangrove area and its physical environment.¹⁴

1. Threats to Wetland and Mangrove Ecosystems

In many parts of the world, wetlands are seen as the land most easily available for development and may be quite lawfully drained and reclaimed for urban or coastal infrastructure, to increase the land available for forestry and farming or as part of a public policy.

In the Latin American and Caribbean region, mangrove ecosystems have been exploited for centuries by a wide range of human activities and many livelihoods and local economies are strongly dependent upon access to mangrove resources.¹⁵

Wetland reclamation is often carried out illegally, particularly in some developing countries, due to the shortage of land in and around cities, which increases the risk of urban encroachment and squatting in marginal mangrove areas.

Mangroves may also be reduced or artificialised by actions ranging from the construction of marinas and water-based recreational or residential facilities, such as canal estates, to the conversion of natural ponds or salines for aquaculture. In addition, mangrove areas may also be lost through indirect actions, often carried out upstream in a catchment area, which impact on the quantity or quality of water supply to the site.¹⁶ Careless management of ground water or surface water levels frequently damages areas of particular ecological value such as mangrove ecosystems. Significant alterations to the water table or sedimentation can have serious, even irreversible, consequences for those ecosystems.

Due to their extraordinary productivity mangrove ecosystems are under pressure on resource overharvesting especially with the expansion of human settlements located in those areas. Mangrove forests for example may be retained for timber and fisheries purposes or converted to aquaculture or salt extraction.¹⁷

Pollution is particularly problematic along populated coastline areas and near oil shipping lanes. Decline of crab populations due to pollution can have significant ecological effects due to the important role mangrove crabs play in structuring mangrove ecosystems.

¹⁴ Brazilian mangroves. By Y. Schaeffer-Novelli, G.Cintrón-Molero, M.L.G. Soares, T. De-Rosa. In *Aquatic Ecosystem Health and Management* 3 (2000) 561-570. See www.elsevier.com/locate/aquech.

¹⁵ Caribbean ecosystems, which include mangroves, sea grass bed, 14% of the world's coral reefs, and numerous estuaries, are under threat from marine-based and land-based pollution, uncontrolled coastal development, and overexploitation of natural resources. Only about 10 % of the domestic wastes from the region's two hundred million inhabitants receive any treatment. *In: Interamerican Law Review*. Vol.30.Number 1. The University of Miami.

¹⁶ *Wetlands, Water and the Law (using law to advance wetland conservation and wise use)*. By: Clare Shine and Cyrille de Klemm. IUCN Environmental Policy and Law Paper n° 38. 1999. Pp.13-42.

¹⁷ See *supra* n.15.

From the legal point of view, leases and concessions to coastal and inland wetlands have historically been granted (in a broader context) to third parties for commercial or recreational purposes ranging from mineral extraction to tourism. Many such instruments predate the enactment of stringent land-use controls or environmental protection legislation. It is often extremely difficult under national legal systems to cancel or refuse to renew existing wetlands leases, to evict unlawful users of wetlands or to require restoration of previously drained or modified wetlands: the implications for compensation can be enormous.¹⁸

III. LAW APPLICABLE TO MANGROVES AND WETLANDS

Appropriate legislative tools are amongst the main instruments that Governments can use to promote the wise use of wetlands and mangrove ecosystems in particular. Their scope and objectives generally involve progression through regulation of hunting and fishing; creation of protected areas; integration of conservation of the natural environment within regional development and land-use legislation; and identification, regulation and management of processes which adversely affect biological diversity. Legislation related to wetlands or mangrove ecosystems in particular are not confined to specific legal instruments or so-called wetland-related legal measures. Specific wetland legislation is comparatively rare.

Conservation and wise use measures may be contained in national laws and regulations on environmental protection, nature conservation, protected areas, environment impact assessment, land-use planning, coastal management, forestry and water resources management or pollution control.

1. Sources of Law

In addition, many different sources of law can contribute to create the knowledge base for a research paper. In general, these govern the procedures, decisions and actions of public bodies and the rights and duties of the private sector, communities and individuals.

These are the sources of law which have been taken into consideration in this paper:

- international law and treaties directly or indirectly related to mangroves and/or wetlands;
- constitutional provisions regarding environmental issues;
- National legislation (statutory) and implementing legislation concerning to mangroves and/or wetlands;¹⁹

2. Legal definition

¹⁸ Wetlands, Water and the Law (Using law to advance wetland conservation and wise use). By: Clare Shine and Cyrille de Klemm. IUCN- Environmental Policy and Law Paper n° 38. IUCN (1999). Pp.64-66.

¹⁹ Reviewing laws and institutions to promote the conservation and wise use of wetlands. Handbook 3- Published: January 2000. Convention on Wetlands (Ramsar, Iran 1971). p. 13.

It is important to consider the definitions of mangrove and wetlands and to give an overview taking into consideration the legislation and the relevant treaties of Brazil, Colombia, Costa Rica and Nicaragua.

2.1. Mangroves

In Colombian legislation, mangroves are defined on the Article 1 Resolution n° 1602 of 21/12/95 as coastal zone ecosystems where species of tree from different families named “mangle” interact with other plants, with animals which live there permanently during some phases of their life, with the waters, the soils and other environmental components. The Article 1 (Resolution n° 1602 of 21/12/95) also refers to the species of tree found in mangrove areas.

The Brazilian legislation considers mangrove (“manguezal” in Portuguese) as a coastal ecosystem that occurs in low littoral flats subject to the action of tides located in relatively sheltered beaches and compound by recent flooded areas where communities of typical plants known as “mangue” are associated (Resolution CONAMA²⁰ n° 303, 20/03/02).

According to this Resolution, mangrove ecosystems occur in “estuarine” regions alongside the Brazilian coastline, between the State of Amapa (north region) and the State of Santa Catarina (southeast region).

The Costarican legislation does not define mangroves however it has a definition of wetlands (see below).

The definition of mangrove was not found in Nicaraguan legislation.

2.2. Wetlands

For the purpose of the Ramsar Convention, wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters.²¹

Wetland’s definition is one area of great controversy among scientists and public policies drafters. Even among member states of the Convention controversy has raised and some countries do not have an agreed legal definition of wetlands.

Since the COP has formally endorsed the use of legal and institutional reviews as an important tool for the wise use²²(other great source of controversy) planning, it is

²⁰ CONAMA- National Environmental Council (**Brazil**).

²¹ Art. 1 Ramsar Convention. For the text of the Convention, see www.ramsar.org/key_conv_e.htm.

²² Ramsar, Article 3(I). In 1987, the third meeting of the parties to the Ramsar Convention accepted the following definition of wise use: the wise use of wetlands is their sustainable utilization for the benefit of humankind in a way compatible with the maintenance of the natural properties of the ecosystem. (Recommendation C.3.3. Regina, Canada). In practice, however, meetings of the Conference of Contracting Parties have muddled the difference between *conservation of listed wetlands and the wise use*

important for members of the review team in each member country to reach a common understanding for the purposes of the review of what is meant by “wetland”.²³

Costa Rica has adapted Ramsar’s definition to the reality of tropical regions, due to the fact that it has been said that Ramsar’s definition is very broad and difficult to apply to tropical systems. (Article 40 of the Organic Environmental Law-04/10/96) which indicates: “The wetlands are ecosystems with dependency on natural or artificial, permanent or temporary, lentic or lotic, fresh, brackish or saltwater aquatic regimes, including the marine extensions to the outside limits of phanerogamous marine regimes or coral reefs or in their absence, to six meters of depth at low tide.” This definition was adopted during the process of elaboration of the National Wetland Conservation Strategy.

This, without question, constitutes a first step in national legislation toward adapting an international legal instrument like the Ramsar Convention to the reality of the country.²⁴

Brazilian legislation has not so far given a definition to wetlands. Since it has accepted the terms of the Ramsar Convention by Decree n° 1.905 of 16/05/96, it can be assumed that Brazil has adopted the wetland’s definition within Article 1 of the mentioned Convention. The same assumption can be taken to the Colombian and Nicaraguan legislation.

3. International treaties

In the legal arena, a series of international instruments have been developed to promote conservation and management of wetlands ecosystems and to address

of all other wetlands. For example, the Guidelines for the Implementation of the Wise Use Concept explicate the concept of wise use in terms of conservation and sustainable development/utilization of resources.*in* Wise use of Wetlands under the Ramsar Convention: a challenge for meaningful implementation of International Law.by David Farrier and Linda Tucker. Journal of Environmental Law-Vol. 12. N 1. For the full text of the article, see www3.oup.co.uk/envlaw/hdb/Volume_12/Issue_01.

²³ Reviewing laws and institutions to promote the conservation and wise use of wetlands. Handbook 3-Published: January 2000. Convention on Wetlands (Ramsar, Iran 1971).

²⁴ At the level of judicial decisions, this topic sparked discussions in relation to the legal possibility of broadening the contents of an international convention or broadening different definitions of the subscribed agreement. However, it was concluded that the new definition on a national level does no more that elucidate the concrete possibility of applying the Convention to a tropical system like **Costa Rica** and in no way does said definition contradict or minimize the definition included in Ramsar. Another point that was discussed within the new definition adopted for the tropics was that, according to this proposal, there would have too many considered wetlands. Therefore, that was being worked on with a series of technical criteria, that the artificial Wetlands which are not necessary for the support of productivity and biodiversity would not be the object of determination of the asset to be protected. In Legal Aspects of the Conservation and Wise Use of Wetlands in Costa Rica. By Grethel Aguilar –Commission on Environmental Law, IUCN – The World Conservation Union.Case study prepared for the Technical Consultation on Designing Methodologies to Review Laws and Institutions Relevant to Wetlands. Gland, Switzerland 3-4 July 1998.

specific categories of environmental threats.²⁵ However, the two most relevant to wetlands are the Spaw Protocol²⁶ to the Cartagena Convention²⁷ and the Ramsar Convention.²⁸

3.1. Spaw Protocol to the Cartagena Convention

The Spaw Protocol to the Cartagena Convention is one of the major legal instruments of the Caribbean Environment Program, refers specifically to the establishment of protected areas and includes a series of protection measures that can be adopted by the Parties to meet the objectives of the Protocol. Except from Brazil, all studied countries are parties to the Spaw Protocol. This approach reflects the realization by the member States of the importance of adopting regional approaches to the protection of the marine environment and sustainable use of marine living resources.

3.2. The Convention on Wetlands of International Importance especially as Waterfowl Habitat

It was in the scenario of great concern at global environmental degradation including wetland destruction that the Ramsar Convention has emerged.²⁹

The aim of the Ramsar Convention is “to stem the progressive encroachment on and loss of wetlands” and to support wetland conservation “by combining far-sighted national policies with co-ordinated international action”.

While the Ramsar Convention focuses on wetlands that are important for migratory waterfowl, it recognizes the overall values of wetlands, including their fundamental ecological functions and their economic, cultural, scientific and recreational value.

The Convention acknowledges that parties have responsibility to conserve wetlands. Parties also have to select particular wetlands to be placed in the Convention’s List of Wetlands of International Importance.³⁰ By placing a wetland in the list parties have

²⁵ There are a number of relevant binding and non-binding international instruments. Such as the Convention on Biological Diversity (CDB) that adopts an inclusive approach to all ecosystems and biological resources. Amongst soft-law international instruments such as Agenda 21, the Rio Declaration on Environment and Development and the Rio Forest Principles.

²⁶ Protocol concerning specially protected areas and wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region. Kingston, Jamaica. 18/01/90. Article 4: each shall establish protected areas with a view to sustaining the natural resources of the Wider Caribbean Region, and encouraging ecologically sound and appropriate use, understanding and enjoyment of these areas.

²⁷ Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region. Cartagena, Colombia. 24/03/83. Article 3: the parties shall endeavor to conclude bilateral or multilateral agreements including regional or sub-regional agreements, for the protection of the marine environment of the Convention area.

²⁸ See *supra* n.4.

²⁹ Wetlands, Water and the Law (using law to advance wetland conservation and wise use). By: Clare Shine and Cyrille de Klemm. IUCN Environmental Policy and Law Paper n° 38. 1999. Pp.26-42.

³⁰ The Ramsar Convention’s Strategic Plan (1997-2002) has given priority to mangroves in its Action 6.2.3, admitting that these are one of wetlands types currently under-represented on the Ramsar List. Action 6.2.3: “Give priority attention to the designation of new sites from wetlands types currently under-represented on the Ramsar List, and in particular, when appropriate, coral reefs, mangroves, sea-grass bed

responsibility for maintaining the ecological character of its wetlands. The objective for internationally listed wetlands is to prevent changes to their ‘ecological character’, with ecological character defined in the following way:

"The structure and interrelationships between the biological, chemical, and physical components of the wetland. These derive from the interactions of individual processes, functions, attributes and values of the ecosystems."³¹

For instance, one of the Brazilian designated Ramsar sites the Reentrâncias Maranhenses Environmental Protected Area³², between the mouths of the Bay de Sao Marcos and the River Gurupi in the State of Maranhao, was created in June 1991.

However, it is not a conventional conservation unit such as a reserve or National Park. Its legislation allows for sustainable use of natural resources, but forbids heavily polluting enterprises and human activities other than traditional resource usage. This consists in an important tool for conservation and management, and is instrumental in the effective implementation of sustainable use techniques within Brazil. There is no management plan since the area has not been fully mapped and evaluated (January 1998). The administration of the site falls under the State government through SEMA (the State Secretariat of Environmental and Water Resources).³³

Among the obligations of the Ramsar Convention is the one that all contracting parties that have environmental impact assessment procedures should ensure compliance with these procedures for any activity or project to be developed in a wetland, whether it is registered in the Ramsar List or not.³⁴

and peatlands.” (Strategic Plan adopted by the 6th Meeting of the Conference of the Contracting Parties. Brisbane, Australia, 9-27 March 1996).

³¹ The fourth meeting of the Conference of the Contracting Parties at Montreux, Switzerland (1990), adopted REC C.4.8: ‘This emphasized the fundamental importance of maintaining ecological character of listed sites. The REC C.4.8 reinforced article 3, requesting contracting parties to take swift and effective action to prevent or remedy changes in ecological character. It instructed the Ramsar Bureau to establish ‘record of Ramsar sites where such changes in ecological character have occurred, are occurring or are likely to occur’. This became known as the Montreux Record.

³² Reentrâncias Maranhenses Ramsar site: area (2,680,911 ha). An area of unparalleled beauty with remarkable natural features. Difficulties in access and low population account for the continuing natural or near-natural spaces in areas occupied by man. The site is representative of both littoral and pre-Amazon regions. Vast mangroves support an abundance of fish, crustacean and mollusk species which are an important food source, especially for birds. The site is a Western Hemisphere Shorebird Reserve Network Site. They also act as an important protection barrier and contribute to increased fish production which is the major source of food and income for the people living along the coast and rivers. Source: www.ramsar.org/index_list.htm. Site visited on 06/06/02.

³³ Adverse factors: the area presents constraints to agriculture by its high salinity and inaccessibility. Shrimp farms could pose a threat if unregulated. Other threats come from the salt industries in the area, mercury contamination from mining activities, deforestation and forest fires used to clear areas for agriculture in the surroundings.

³⁴ Wetlands of South America (An agenda for biodiversity conservation and policies development). Executive summary. Eds. Pablo Canevari et al. Wetlands International (2001). pp.31-48. For more information see: www.wetlands.org.

4. Constitutional provisions

Not surprisingly, wetland-related provisions can be found in Latin-American Constitutions.

By contrast, all studied countries' Constitutions have enacted provisions safeguarding environmental rights in general.

The Brazil's 1988 Constitution recognizes, in Article 225, the right of every person in the present and future generations to an ecologically balanced environment and a healthy life. The Amazon and Atlantic coastal rainforests (within are found mangrove forests³⁵), the coastal zone, as well as the Pantanal wetlands³⁶, are declared to be "national patrimony"³⁷, though the exact legal meaning of this phrase is uncertain. According to José Paulo Sepulveda Pertence, Judge of the Federal Supreme Court of Brazil, "the basic idea of Art. 225 is that there are collective rights in the environment which are superior to and enforceable against private property rights".³⁸ The Brazilian Constitution in its Articles 23 and 24 states the competence to enact legislation that aims to protect the environment and to avoid pollution in all its forms is to be shared at the state level and national level.

Colombia's Constitution has the impressive amount of at least 21 articles that are concerned to environmental issues. One of the most important is the Article 58 that states land ownership has to observe the "social function of property" right which implies to an "ecological function of property rights".³⁹

Colombian's Constitution also embraces a broad concept of collective rights, including economic, social, cultural, and environmental rights. A bill to implement the constitution's authorization of "popular actions", by which any person or NGO can seek to enforce collective rights, has been pending for some time in the Colombian Congress. Meanwhile, the Ombudsman for Collective Rights and the Environment and some NGOs have utilized the action of "tutela" in the Constitutional Court to defend environmental and other collective rights.⁴⁰

³⁵ According to Article 3, decree n° 750 of 10/02/93.

³⁶ Brazil has the world's largest wetland area. The above-mentioned Pantanal region, for instance, is larger than many European countries. In: An Inventory of Brazilian Wetlands. Edited by Antonio Carlos S. Diegues. With contributions from NUPAUB – Center for Research on Human Population and Wetlands in Brazil. IUCN, 1994.p.11.

³⁷ Article 225, § 4° -Federal Constitution of 05/10/88 (Brazil). For full text see, www.georgetown.edu/pdba/Constitutions site visited in 22/04/02.

³⁸ Symposium: Sustainable Development in Latin American Rainforests and Role of Law. Session III. Legal and Environmental Challenges to Latin American Rainforests: the Roles of Law and of the Judiciary. In: Texas International Law Journal. Vol. 32.Number 1. Winter 1997. P.4.

³⁹ Art. 58, Political Constitution of Colombia of 06/07/91.For full text, see www.georgetown.edu/pdpa/Constitutions.

⁴⁰ Symposium: Sustainable Development in Latin American Rainforests and Role of Law. See *supra* n.20. P.8.

The Costarican's Constitution currently in force recognizes in its Article 50 the right of every person to an ecologically balanced environment and a healthy life.

The Nicaraguan's Constitution guarantees the same right to an ecologically balanced environment and a healthy life and also recognizes the right/legitimacy of the State to conclude contracts to the sustainable exploitation of its natural resources in case that national interest requires this measure (Article 102).⁴¹

5. Legislative and Regulatory tools

5.1. Legal Regime for Land Tenure

In the case of both public and private ownership of the natural environment, and the resources and services it generates, what matters is that property rights are well defined.

In the studied countries mangrove areas are state-owned or private-owned.

However, it has become clear that no single type of property regimes can be prescribed as a remedy for all problems of resource overuse and environmental degradation.⁴²

In Brazil, mangrove areas can be found either in the state or private ownership. Most of the time, mangrove areas are situated in the so called "marine terrains" (terrenos de marinha in Portuguese) and alongside the beaches, ipso facto they are under public property rights regime according to Article 20 of Federal Constitution of 05/10/88.

In Costa Rica the Law n° 276 of 27/08/42 (Water Law) has established as national property the beaches and maritime zones (Article 3). The Law of Maritime Zone (Law n° 6043 of 02/03/77) declares as public zone mangroves alongside the coastal, inlets and estuary areas of the country (Art.78) no matter its extent.

The Nicaraguan's legislation (Law n° 217 of 27/03/96) establishes as state-owned beaches alongside rivers, lakes and marine areas, as well as saline and consolidated terrains located up to 30 meters to the maximal tidal mark (Article 72).

5.2. Various legal tools to conserve wetland and mangrove ecosystems

The purpose of the following sections is to consider some of the mechanisms adopted in the studied countries to achieve the conservation of wetlands in particular mangrove ecosystems such as site-specific mechanisms (protected areas) and non-site specific (ecosystem type protection).

⁴¹ Art. 102, Political Constitution of Nicaragua of 09/01/87. For full text, see www.georgetown.edu/pdpa/Constitutions/Nica/nica95.html, site visited on 22/04/02.

⁴² Rights to Nature (Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment). Edited by: Susan S. Hanna, Carl Folke and Karl-Göran Mäler. Island Press. Washington D.C., 1996.

a) Site-specific mechanisms or protected areas

A protected area is broadly defined as an area of land and/or sea specially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.⁴³

They can only be established and managed according to legal provisions laying down the conditions and procedures required for their creation, setting out use prohibitions or restrictions, providing for enforcement measures and penalties, instituting management bodies and determining their powers and tasks. Therefore, every protected area has boundaries and a declaration of permitted and non-permitted uses within it. Law is therefore an essential prerequisite of any protected area.

Another important requirement is a clear and accurate determination of the area, including where applicable, its buffer zone. There is a great variety of instruments that have been developed for that purpose ranging from stricted protection (such as strict nature reserves) to managed resource protected areas created mainly for the sustainable production of the natural ecosystems.⁴⁴

In Costa Rica, wetlands and mangroves are types of management units (categoría de manejo) that can be found inside a protected area such as wildlife protected areas (áreas silvestres protegidas)⁴⁵ according to the Article 32 of the Organic Environmental Law (Law n° 7554 of 04/10/96).

According to Article 37 of the same Law, once the Executive Power has established the natural protected area, no matter what conditions the management plan has, the Ministry of Environment and Energy should include, within its geographical limits, pieces of private lands which should follow the conditions assigned in the law and in its respective management plan for this category of protection.

The same Law (Article 41) has declared wetlands and mangroves of public interest (whether on private or public ownership) and as multiple-use category. Although

⁴³ This definition was adopted by IUCN The World Conservation Union – Guidelines for Protected Area Management- Commission on National Parks and Protected Areas with the assistance of the World Conservation Monitoring Center. IUCN (1994).p.7

⁴⁴ The IUCN – the World Conservation Union has given international guidance on the categorization of protected areas. This system of categories has been widely used. It has been incorporated in some national legislation in many parts of the globe. The six essential types are: strict nature reserve/wilderness area whose protection is for science or wilderness protection; national park which is mainly for ecosystem protection and recreation; natural monument which is for conservation of specific natural features; habitat/species management area which is managed mainly for conservation through management intervention; protected landscape/seascape which are for promoting the conservation and recreation in those areas and managed resource protected area which is mainly for the sustainable use of natural ecosystems. *In*: IUCN The World Conservation Union – Guidelines for Protected Area Management-Commission on National Parks and Protected Areas with the assistance of the World Conservation Monitoring Center. IUCN (1994).

⁴⁵ Those so far declared *wildlife protected areas* can only be suppressed or altered by an act of parliament.

wetlands have been declared a category of management under special protection by an act of parliament, so far in practice no legislation has been enacted to establish the practical procedures to be taken into account when managing such areas. This is a great gap in the legislation to the detriment of mangrove ecosystems.

In addition, the Article 58 of the Law n° 7788 of 30/04/98 (Biodiversity Law) has stated that “Wetlands” are “the natural protected areas are limited geographic zones constituted of wetlands and portions of the ocean...” subject to declaration by the Executive Power and to studies to determine its management category. It must be noted that the previous Law n° 7554 of 04/10/96 had declared the “wetlands” to be a management category, which, as of this date, has an undefined scope. If we assume that the Biodiversity Law (n° 7788 of 30/04/98) is in contraposition to the Organic Environmental Law (n° 7554 of 04/10/96) in what “wetlands” refers to and the Biodiversity Law is a more recent law, then the principle that the more recent annuls previous one in areas of contradiction should be applied. Therefore, the “wetlands” should be considered as protected natural area. However the current situation lends itself to confusion and there exists no standard criteria for interpretation.

It would seem that if the option has been used that “wetlands” are protected natural areas, subject to declaration by the Executive Power and to studies to determine its management category as indicated in the Law n° 7788 of 30/04/98 (Biodiversity Law), then some confusion that persists could be eliminated. Although at the moment, there is a legal gap as far as a determination of what “Wetlands” are within environmental legislation.⁴⁶

In Brazil⁴⁷ the Law n° 9.985 of 18/07/00- Protected Area Law) states the National System of Conservation Units (SNUC). In its Article 7 it has adopted two major categories of conservation units such as : total protection units and sustainable use units. Among the total protection units, there are ecological stations, biological reserves, national parks, natural monuments and wildlife refuge. The sustainable use units are classified into environmental protected area (APA), relevant ecological interest area, national forest, extractive reserves, fauna reserves, sustainable development reserves and private natural heritage reserves. It is of great value to

⁴⁶ Legal Aspects of the Conservation and Wise Use of Wetlands in Costa Rica. By Grethel Aguilar – Commission on Environmental Law, IUCN – The World Conservation Union. Case study prepared for the Technical Consultation on Designing Methodologies to Review Laws and Institutions Relevant to Wetlands. Gland, Switzerland 3-4 July 1998.

⁴⁷ **Brazil** is considered to be the wealthiest country in terms of megadiversity, as it has at least 10 to 20% of the world’s biological diversity, a flow of 5,190 Km³/year in its water networks, that is 12.7 % of the world’s flow, and a vast territorial area, besides the 3.5 million sq. Km. of coastal and marine waters under its jurisdiction. (National Report prepared for the 7th Meeting of the Conference of the Contracting Parties to the Ramsar Convention). For full text see, www.ramsar.org/cop7_nr_brazil.htm. Site visited in 18/04/02. It is surprising that only about 3% of **Brazil** are protected. This percentage is considered small in comparison to protected areas in other developing countries such as Indonesia (16%), Venezuela (8%) and **Costa Rica** (8%). The IUCN Wetlands Program- an Inventory of Brazilian Wetlands. Ed. By Antonio Carlos S. Diegues. IUCN, 1994. Pp. 19-22.

point out that Constitutions of some Brazilian states⁴⁸ include mangroves and other coastal wetland types amongst the list of protected habitats.

The Nicaraguan Protected Areas' legislation, which establishes the national system of protected areas (SINAP) has adopted in full the IUCN's (the World Conservation Union) system and guidance on the categorization of protected areas (Article 9 Decree n° 14 of 02/03/99).

The Article 23 of Law n° 217 of 27/03/96 establishes the obligation of respecting a tight use and management planning (plan de manejo) inside protected areas if they are under private ownership. Those private stakeholders who do not accept these conditions will be subject to expropriation process before the payment of indemnification.

In addition, the construction of artificial channels for salt production and aquaculture is permitted. There is restriction if the area is situated in private or public ownership under the jurisdiction of the National System of Protected Areas (SINAC).

In Colombia, mangroves have been recognized as ecosystems that should be under the category of protected area, by the Article 128 Resolution 1681 of 04/08/78, though the exact meaning of this statement remains not yet clarified.

According to Article 1 Resolution 0233 of 29/03/99, planning policies (such as the Colombian Mangroves Plan) states that the Executive Power can establish mangrove areas for purposes of strict conservation.

b) Non-site specific or ecosystem type protection

Certain countries have enacted legal instruments designed to protect particular types of natural habitats and ecosystems. There are also laws that regulate specific activities, which may have adverse effects on the natural environment. Wetlands are considered as one of the most threatened types of ecosystem and have accordingly been singled out by an increasing number of national legislation.⁴⁹

The most commonly used method to achieve wetland's conservation is to establish ecosystem type protection such as a permit requirement for activities that may destroy or alter wetlands or wetland functions wherever they are located.

In a few cases, the obligation to conserve wetlands or certain types of wetlands is enshrined in the constitution. For example, the Brazilian Constitution of 1988 declares that the coastal zone belongs to the national heritage ("national patrimony") and that any utilization of that area must be approved by an act of parliament under

⁴⁸ For instance, Article 195 Constitution of State of Sao Paulo of 05/10/89 which establishes: The Permanent Preservation Areas are: I) mangrove ecosystems; II) estuary areas.

⁴⁹ Biological Diversity Conservation and the Law. (Legal mechanisms for Conserving Species and Ecosystems). By: Cyrille de Klemm in collaboration with Clare Shine. IUCN.1993.Pp.177-217.

conditions ensuring the conservation of the natural environment. Similarly, many of the constitutions of the Brazilian States, adopted in 1989, list permanently protected habitat types which include river banks, lakes, springs, estuaries, lagunas, mangroves and deltas, although this varies from one State to another.

The Brazilian's Forest Code has brought to reality one fundamental tool for the conservation of mangrove ecosystems, which is the Permanent Preservation Area (Área de Preservação Permanente-APP). According to Article 2 of the Law (n° 4.771 of 15/09/65) which indicates that all forests and other natural vegetation situated alongside barrier islands with the function to steady dunes and establish mangroves ecosystems should be considered vegetation of permanent preservation by the only effect of the present law.

Since mangroves are considered "specially protected areas" (Article 2 Forest Code Law n° 4.771/65), they can only be altered or suppressed by an act of parliament. Theoretically, mangrove areas do not need to be included into park or reserves, since by the only effect of the Forest Code they should be conserved.

c) Use-oriented legislation

Among the various techniques to achieve conservation and wise use of mangrove ecosystems is to have a long-term and effective system of user permits. The law, for its part, can only support wise use if the components of a country's legal systems (statutes and regulations) work for and not against this objective. Therefore, measures for sustainable use are extremely important, e.g., quotas for hunting in order to avoid overexploitation of wetland resources such as fish, crabs, medicinal plants, peat or coral.

In Costa Rica, the Organic Environmental Law (Article 4, Law n° 7554 of 04/10/96) declares, specifically on the subject of "wetlands" in relation to user permits, that the "wetlands" and their conservation are of public interest, because they are of multi-usage, whether or not they are protected by the laws related to the subject. With this declaration of public interest, the State can impose limits to the use of the resources within the "Wetlands" in order to protect the collective interest. On the other hand, because of the "public interest", wherever there are mangroves, a user permit should be requested from the Ministry of Environment and Energy if the activity differs from those listed in Article 19 of the Forestry Law (Law n° 7575 of 13/02/96). These are, for example, it remains prohibited in forested areas to make changes to the soil, or to plant other forests.

User permits could be given for: constructing dwellings, recreational installations, ecotourism, public or private infrastructure projects, cutting of trees if human security demands, scientific interests and to prevent fire in the forest. Under the same law, Article 1 (Law n° 7575 of 13/02/96) declares that is prohibited to cut or use mangrove trees which are property of State by virtue of public interest.

Nevertheless, numerous user permits (salt production and aquaculture) were given before the enactment of this law and through recent regulation they have been renewed in detriment to mangrove ecosystems (particularly their forests) so that they remain in effect until they expire. The forest administration also can grant extensions to the permits, as long as the interested parties have complied with the environmental requirements. (Article 6, Decree 29342-MINAE of 06/02/01).

In Nicaragua, the Law n° 217 of 27/03/96 in its Article 74 establishes that “any use, management or exploitation of aquatic and coastal ecosystems and their hydrological resources, is subject to a presentation of a management plan according to the conditions stated by the law which purpose is to achieve their conservation.”

Moreover, in Nicaragua, by virtue of Article 91 of the Law n° 217 of 27/03/95, the Ministry of Environment and Natural Resources can grant special permission (“permiso especial” in Spanish) for the sustainable exploitation of mangroves and other “vegetation” in the coastal fringes, inlet areas and channels. This is in case of areas that are not part of the National Systems of Protected Areas (SINAC) and as well for activities that are not under the obligation of the presentation of Environment Impact Assessment. Both cases are regulated by specific instruments (Decree n° 14 of 02/03/99 and Protected Areas Law).

In other terms, in Article 50 of the Decree n° 9 of 27/07/96 (Regulation of the Law n° 217 of 27/03/95), it makes clear that any person (from the private or public sector) who wants to develop productive activities that implies intervention in mangroves areas must request a special permit. Those activities which do not affect in the ecosystem are free of the obligation. This Article, however, does not explain up to which point the level of impact is under the consideration of the law, as well as it is hardly difficult to execute any activity in mangrove area that does not cause intervention in the ecosystem in a negative or positive way.

In Nicaragua, the Decree 9 of 27/07/96, Article 48, assures that for the purpose of subsistence the small-scale uses of the natural and hydrobiological resources should be permitted.

In Colombia, according to the Article 3 of Resolution n° 1602 of 21/12/95, the environmental authority can allow persistent forestry exploitation in mangroves areas, which were determined to be appropriate for logging. These authorities territorially fix those areas. However, there are areas where logging is prohibited. In the same law, Article 4 has stated that the representative entities of those ancient activities aimed at forestry exploitation of mangrove areas carried out by indigenous or local communities, which are no longer considered sustainable by the environmental authorities, should look for investments in order to develop economic alternatives for their subsistence taking into consideration their ethnical identity. In this regard in Colombia, the Resolution 1602 of 21/12/95 has assured the legal protection for traditional practices within mangrove areas. The only requirement for its continuity is

that they have to be in accordance with the law in force and the principle of sustainability.

Further Resolution n° 020 of 09/01/96 has 'weakened' the terms and restrictions of the Resolution n° 1602 of 21/12/95, with the excuse of clarifying it. In Article 1, changing the terms of Article 2 of Resolution n° 1602, it even gives permission to exclusive forestry exploitation ("aprovechamiento forestal único" in Spanish) under the allegation of being of public interest, as well as for the construction and building initiatives. The only requirement is that they should present a plan of restoration and mitigation.

In other terms, any activity is permitted since it is prescribed in the zoning plan of the area and previously being authorized by licenses, concessions or permissions demanded by the regulatory instruments in this matter. (Article 4 of Resolution n° 1602 modified by Resolution n° 020 of 09/01/96).

5.3. Institutional Arrangements

Environmental issues in most of the studied countries are organized sectorized with responsibilities assigned to various state ministries, such as Ministry of Environment, Energy and Mining, Institutes of Fisheries, and activities such as tourism and education which are assigned to different ministry's boards.

In the case of wetland of mangrove ecosystems it is often the case that they are declared areas of special protection, different institutional competencies are concurrent. Whereas the administration of these areas has been entrusted to a single institution, responsible, for instance for the approval of planning and authorization of certain activities, the other institutions or ministries retain their responsibilities on resources and activities.

In Costa Rica according to the Article 7 (h) of the Law for the Conservation of Wildlife (L.C.V.S)⁵⁰, the General Direction Board for the Wildlife (SINAC), linked to the Ministry of Environment and Energy is the institution in charge with the administration, supervision/monitoring and protection of wetlands.

It is parallel to the disposition contained in the Organic Environmental Law of 04/10/96 that declared the Wetlands as a management category, under the administration of the Ministry of Environment and Energy. Therefore, wetlands fall under the administration of (SINAC-MINAE)⁵¹.

Another administrative decision was made with Decree 22839-MINAREN⁵² of 22/01/94, which established the creation of the National Wetland Commission. This was meant to be the auxiliary organ of MINAE to establish and recommend the

⁵⁰ Ley de Conservación de la Vida Silvestre (Wildlife Conservation Law). Ley n°. 7.317 del 31/10/92.

⁵¹ MINAE (Ministry of Environment and Energy); SINAC (National System of Conservation Areas).

⁵² MINAREN (Ministry of Natural Resources, Energy and Mining). Currently, it has been designated as MINAE (Ministry of Environment and Energy);

management features and policies that permit the conservation of the country's Wetlands. It was also to facilitate the coordination and technical cooperation of the different institutions that work in this field. Although it has been created by decree, it is not yet functioning.

Moreover, the National Institute of Fisheries (INCOPECA) should also be pointed out as an important player within the administrative competencies over Wetlands. In conformity with the Article 5 of Law n° 7384⁵³ it has within its power: to write, study, and apply legislation, to regulate and avoid the contamination of maritime resources and aquaculture as a result of fishing efforts, and other activities that cause contamination.⁵⁴

There has been a discussion concerning whether it is INCOPECA or SINAC/MINAE that has authority to issue permits in Wetland zones since in some cases it seems that there exists an overlap of activities or little clarity in the letter of the law. With regard to this, the General Attorney's Office issued proclamation C-215-95 which determined that for protected areas requiring total protection of their Natural Resources (Biological Reserves, National Parks, State Wildlife Refuges) and because of the uniqueness of the material needed to be regulated, the authority rests with MINAE. For the rest of the management categories (mangroves, included), the welfare of public and private domain INCOPECA has the authority.

This overview leaves one with a broad spectrum of institutions that regulate the conservation and wise use of the Wetlands, all of which have very specific purposes in the field and at first glance it would seem that there is no problem. However, the practical situation is that the duplication of authority and function is rampant and it is unclear as to which agency is in charge of which activity. The legislation in this case has erred on the side of an excess of institutions and authorities to regulate the Wetlands causing confusion between users to the detriment of the resource.

In Brazil, the Decree n° 9760 of 05/09/46 (Article 1) has declared that mangroves under the influence of tides are considered marine terrain ("terrenos de marinha") and therefore belong to the Federal Government ("Uniao"). This asset was confirmed by the Brazilian Constitution of 1988 (Article 20). Belonging to the Federal Government implies that mangrove should be administrated by the Patrimonial Service of the Federal Government (Servico do Patrimonio da Uniao). Nevertheless, in 1986 the National Environmental Policy Law (Article 8 Law n° 6.938 of 31/08/81) established that the National Environment Advisory Council (CONAMA) through its operational auxiliary board is the one in charge of granting permits and monitoring specially those areas declared by the Federal Constitution as "national patrimony" (Article 225, § 4°).

⁵³ Law n° 7384: Law for the Creation of INCOPECA (Instituto Costarricense de Pesca y Acuicultura).

⁵⁴ Guía de Procedimientos para el Manejo de Humedales en Costa Rica. By: Grethel Aguilar Rojas. Ed. Por Rocío Córdoba Munoz, Víctor Calvo Cruz. 1. Ed. San José: IUCN, 1996. pp.27-28.

Other consequence of this recognition is that the coastal zone and coastal rainforests are “national patrimony” as well.

In Colombia, according to the Law 99 of 22/12/93, the Ministry of the Environment is the public entity in charge of the management and conservation of the environment and renewal natural resources of the country. Under its authority, there are the Regional Autonomous Corporations and the Corporation for the Sustainable Development. Those institutions carry regional duties in respect to the decisions and orientations imposed by the Ministry of the Environment. In terms of the Article 10 the Law 99 of 22/12/93, the administration over coastal area is subdivided into Subdivision of coastal and maritime zones, Subdivision of forestry and wildlife and Subdivision of forest areas planning and management.

It could be considered an overlapping of authorities the fact that Article 5 of the same law under consideration, states that the conservation, preservation and protection of the marine environment are under the authority of the Ministry of Defense, more specifically the General Maritime Agency. This situation could lead to an overlapping of authorities especially in the absence of a mechanism for coordination between the different authorities.

In Nicaragua, the Article 61 (Law 217 of 27/03/96) points out that the Ministry of the Environment and Natural Resources (MARENA) is in charge of the management of mangroves. On the other hand, the MIFIC (Ministry of Finances) is the one in charge of the management of mangrove areas, as far as it is dealing with water usage. (Law 290, Article 28).

5.4. Generally applicable legal mechanisms of importance to the conservation of wetlands and mangrove ecosystems

5.4.1. Environmental Impact Assessment

The processes of Environmental Impact Assessment are mechanisms incorporated in all studied countries, for those projects with environmental risk or take place in fragile ecosystems such as those within coastal areas. In this sense, any project or activity that may have a significant impact on mangrove ecosystems or wetlands should include an Environmental Impact Assessment before its execution.

Environmental Impact Assessment is a major tool to achieve the conservation of wetland and mangrove ecosystems. It assures that decision is taken in the full knowledge of the consequences pertaining to environmental protection in general.

In Brazil, the National Environmental Policy Law⁵⁵ (based on the United States' National Environment Policy Act) has required environmental impact assessments for major developments projects.

In Costa Rica, the Organic Environmental Law (Law 7554 of 04/10/96) indicates that construction of infrastructure may not damage ecosystems, principally those related

⁵⁵ Lei n° 6.938 de 31/08/81. For full text see, www.senado.gov.br/servlets/NJUR site visited on 21/05/02.

to hydric resources. Therefore, any activity that could affect the Wetlands will require Environment Impact Assessment.

One of the most important contributions of the Organic Environmental Law (Law 7554 of 04/10/96) is the legal support that is given to the evaluation of environment impact. As general principles, it establishes that “all human activities that alter or destroy elements of the environment or generate residual, toxic or dangerous materials, will require an evaluation of environmental impact. In this manner, the EIA is an instrument that gives the Administration more information with which to make decisions that will prevent damage to the environment.

In Nicaragua, the Decree 45-94 of 31/10/94 (Article 5) assigns the activities that need the EIA in Article 5, which are filing for the rehabilitation of damaged areas, tourist installations and other projects related to urbanization and sports facilities if those initiatives are about to be developed in environmentally sensitive areas or protected areas. In some cases prescribed by the law, it is necessary to conduct an EIA to grant a user permit (Article 26 Law 217).

In Colombia, according to Resolution 020 of 09/01/96, buildings and industrial infrastructures that use mangrove areas should submit an EIA if they intend to start operating before the regulations constricted in the zoning plan.

5.4.2 Incentives to Protect the Environment

Incentives are needed to change or modify behavior and to encourage and enable the private sector, communities and individuals to contribute to coastal conservation. Appropriate instruments are also needed to generate additional and sustainable sources of finance.

Experience worldwide shows that government funding for conservation is rarely enough on its own to promote effective management. In most cases, coastal actors need to look beyond direct government support (governments change and so do their policies and priorities) to innovative financing mechanisms. The importance of well-designed incentives is recognized by the Convention on Biological Diversity, which requires Parties to adopt incentives for the conservation and sustainable use of components of biological importance that are economically and socially sound (Article 11).

However, the importance of incentives for public conservation is often overlooked, even though local authorities that conserve coastal areas are fulfilling a wider public interest. Legal systems should where possible encourage provincial and local governments to engage actively in coastal conservation (not just in the creation of site-specific protected areas). Private conservation may also be effectively promoted through financial grants and loans, nevertheless not all legal systems provide for this type of incentive.

On the other hand, it is still usual to find pieces of legislation based on perverse incentive that induces behavior leading to the reduction of biodiversity and result from government intervention failure. Generally designed to achieve other policy objectives, therefore are unanticipated side effects of that policy. Removal of perverse incentives may provide one of the most cost-effective instruments for promoting conservation.

In this regard, Costa Rica's Biodiversity's Law (Article 103, Law n° 7788 of 30/04/98) has a specific provision on that, so called "disincentives". "The Ministry of Environment and Energy and remaining public authorities, taking into consideration public interest, should revise existing legislation and propose or carry out changes necessary to eliminate or reduce incentives which are negative for the conservation of biodiversity and its sustainable use and propose appropriate "disincentives".

All in all, these are the most important incentives found in Costarican legislation: promotion of investment in sustainable use and conservation of biodiversity, establishment of training programs, tax exemptions for all equipment and materials (except automobiles), public recognition with the ecological flag and national awards, payment for environmental services, favorable credits to small businesses in buffer areas and any other incentives existing under the Law for Promotion of Scientific and Technological Development (Law n° 7169 of June 1990).

Costa Rica's Biodiversity Law (Article 101-2, Law n° 7788 of 30/04/98) provides for payment of incentives for community participation in the conservation and sustainable use of biodiversity, especially in areas harboring species that are rare, endemic or in danger of extinction, and for financial assistance to communities that manage biodiversity.⁵⁶

Likewise the Forestry Law (Law n° 7575 of 13/02/96) establishes some conservation incentives such as certification of forest conservation and exemptions from territorial taxes among others.

In terms of intra-government incentives (between different tiers of government) to promote conservation, Brazil's federal government provides fiscal compensation to states whose tax base is reduced due to large-scale land-use restrictions to protect watersheds. This is delivered through an ecological version of Brazil's value-added tax system (ICMS), which has been designed in cooperation with federal, state and municipal governments and NGOs. In terms of giving grants and subsidies to support conservation to NGO, local communities and individual both Brazil and Costa Rica have enacted laws in this regard.

⁵⁶ Legal Aspects of the Conservation and Wise Use of Wetlands in Costa Rica. By Grethel Aguilar – Commission on Environmental Law, IUCN – The World Conservation Union. Case study prepared for the Technical Consultation on Designing Methodologies to Review Laws and Institutions Relevant to Wetlands. Gland, Switzerland 3-4 July 1998.

As part of an incentive policy in Nicaragua, the Law 217 of 27/03/96 has stated that the State would grant incentives to those that spontaneously contribute for the protection and restoration of the environment. Basically, this policy is based on tax incentives. (Articles 39 and 44).

The Decree 14 of 02/03/99 - MARENA⁵⁷ in its Article 63 establishes that this Ministry would grant certificates to landowners whose lands are declared protected areas or even in buffer zones, and carry out scientific research and conservation activities in those areas.

5.4.3. Procedural rights to protect the environment

Success to the conservation and wise use of mangrove ecosystems and wetlands in general requires the existence of procedural tools stated by the law which guarantee access to justice resulting in the involvement of civil society.

This measure can be essential for lasting solutions aiming at the conservation and wise use of the referred ecosystems. In order, to participate effectively, citizens must have timely access, at the various levels of government, to the political process and mainly access to the justice system.

a) Access to justice

In Brazil one of the most important laws is the Law n° 7.347 of 1985 which states that NGOs and public prosecutors to initiate “popular civil actions” for the enforcement of environmental and other “diffuse” or “collective” rights.

The mentioned Law n° 7.347 of 24/07/85 authorized ‘public civil actions’ to enforce ‘diffuse’ or collective rights. Private NGOs, as well as the ‘Ministério Público’ (Public Prosecution Board) and other governmental entities, were authorized to seek monetary damages and injunctions in the enforcement of consumer, environmental and cultural rights.

This recognition of standing for private associations to bring citizen suits on behalf of diffuse interests represented a radical change in theory. Unfortunately, however, NGO’s have so far been unable to organize themselves to utilize this tool. Almost all public civil actions have in fact, been brought by the Ministério Público.

On the other hand, the Consumer Protection Law (Law n° 8.078 of 11/07/90) went even further in its provisions for the protection of diffuse rights. Although citizen suits under that law have also been rare, there has been widespread voluntary compliance by businesses. Dr. Kazuo Watanabe attributed this compliance to the drafters’ successful efforts to involve businesses actively in the writing of the law.⁵⁸

⁵⁷ MARENA (Ministry of the Environment and Natural Resources).

⁵⁸ Symposium: Sustainable Development in Latin American Rainforests and Role of Law. Session III. Legal and Environmental Challenges to Latin American Rainforests: the Roles of Law and of the

In Costa Rica, an Environmental Administrative Tribunal (Article 103- Law n° 7554 of 04710/96) has been created and given charge of recognizing and resolving administratively the charges brought against public or private entities, for violation of the legislation protecting the environment and natural resources. It will gather the necessary proof to find the truth of the matter being reported and will be governed by oral, official and expedient principles. The corresponding indemnification will be established through administrative channels and their decision will be final.

In Colombia, the Law 99 of 22/12/93 in its Article 97 has given instruments that facilitate the task of preventing illegal acts against the environment, such as the creation of an Attorney's Office to the Environment, whose duty is to intervene in the administrative sector (even in the police's administration) in order to evaluate their actions.

In Nicaragua, it is stated in Law 217 of 27/03/96 that every citizen can present an administrative or criminal cause against those who violate the General Environmental Law. (Article 2). In case of violation, the Attorney's Office to the Environment will take part in the procedures in order to watch the compliance of the Environmental Laws. (Article 135 Law 217 of 27/03/96).

b) Public participation

According to Principle 10 of the 1992 Rio Declaration "environmental issues are best handled with the participation of all concerned citizens at the relevant level", and states that to advance such participation, emphasis should be placed on three important issues: 1) access to information; 2) access to process; and 3) access to justice.

The role of public participation was also highlighted by the Organization of American States (OAS) in 2001, in its V Regular meeting in Washington, DC, resulting in a document whose intention is to encourage the responsible participation of governments and civil society in decision-making for sustainable development.⁵⁹ One of the policy recommendations of this document gives emphasis to the following: "Rec.2: meaningful public participation in decision-making processes on sustainable development depends on laws and regulations that will ensure access to relevant and timely information, access to the decision-making process, and access to the justice system.

In addition, legal frameworks should clarify and expand the legal standing of those persons and communities affected by development decisions, seek a reasonable

Judiciary. In: Texas International Law Journal. Vol. 32.Number 1. Winter 1997. p.5. Dr.Kazuo Watanabe, Professor of Law at the University of Sao Paulo (Brazil).

⁵⁹ Inter-American Strategy for the Promotion of Public Participation in decision-making for Sustainable Development.OAS.Unit for Sustainable Development and Environment. Washington, D.C., 2001.For more details see: www.ispnet.org. Site visited 12/01/02.

balance in the roles and joint responsibilities of the various level of government and civil society, and be adapted continuously to respond to changing reality or when they constitute an obstacle to public participation.

In Colombia, Resolution 0233 of 29/03/99 emphasizes the importance of coordination in the process of establishing the zoning areas for various purposes within mangrove areas. The community should take part in the zoning process.

In Brazil, an important tool for the participation of civil society in the one stated in Resolution CONAMA 1 of 23/01/86, which establishes the realization of public audiences in the process of Environmental Impact Assessment.

The Brazilian law 9.985 of 18/06/00 (Article 5), that creates the National System of Protected Areas, has insured that traditional communities and indigenous populations who live inside a designated protected area will take part in the process or the management and monitoring of such areas.

Costa Rica in its Organic Law of the Environment (Law 7554 of 04/10/96), in general terms, assures that the State and municipalities should promote the public participation in the process of decision-making in environmental issues (Article 6).

In Nicaragua, the Decree 14 of 02/03/99 in its Article 21 states that protected areas' management plans should create mechanisms to public participation in the issues concerning those areas and as well as buffer zones.

5.4.4. Integrated planning/zoning

Costa Rica passed coastal zone legislation in 1977 (Law n° 6043 of 02/03/77) that defines the coastal zone as the first two hundred meters from the sea.⁶⁰ It means that new construction in the first fifty meters is forbidden, and developments in the next one hundred and fifty meters require a local permit that should be consistent with a local land use management plan. However, most local governments have failed to prepare land use plans.⁶¹

In Brazil, pursuant to the National Coastal Zone Management Plan (Law n° 7.661 of 16/05/88), non-binding federal guidelines were developed for each Brazilian coastal state. For instance, the state of Sao Paulo enacted special legislation in 1998 that provides for development of ecological-economic coastal zoning, regulations for conservation and sustainable use of coastal flora and fauna associated with ecotourism and continuation of subsistence activities.

⁶⁰ In 1996, Costa Rica's legislature passed another law regulating coastal zone areas. The Organic Environmental Law (Articles 42 and 44 Law n° 7554 of 04/10/96), empowers the Ministry of Environment and Energy to designate coastal zones as protected areas and proscribes any activity threatening the natural cycle of ecosystems in these areas.

⁶¹ Integrated Coastal Zone Management in the Caribbean Region. By: Daniel Suman. The University of Miami- Inter-American Law Review. Fall 1998. Vol.30.N° 1.pp.32-51.

In Colombia, a joint initiative from the Ministry of the Environment and the International Tropical Timber Organization has resulted in the elaboration of a “Diagnosis of the Preliminary Zoning for mangrove areas of Pacific and Caribbean in Colombia”.

The Resolution 0233 of 29/03/99 states in its Article 1 that the zoning plan for the management of mangrove areas should follow the procedures of the zoning adopted by the Colombian Mangrove Project.

This consists in an important tool for the sustainable development of the mangrove areas.

IV. GENERAL CONCLUSIONS

Mangroves have received insufficient attention from legislators, conservation donors and agencies in Latin America. Perhaps the major reason that mangroves are underrepresented in legal systems and conservation programs is that their social, biological, ecological and economic importance have not been yet sufficiently recognized.

From the analysis of the regulations that directly or indirectly affect mangroves in the countries studied, the following conclusions arise:

None of the countries studied have so far formulated domestic legislation regulating wetland ecosystems or mangroves in particular at the level of legislative instrument (acts of Parliament). Some countries have regulations oriented to protect specifically mangrove ecosystems at the level of regulations.

The paper points out that this could be considered a weak point due to the fact that a single legislative instrument to deal with the wetlands and mangroves issue would assure a better performance in the conservation of these ecosystems and would not be easily subjected to amendments.

According to this, a cross-sectored, well-designed and comprehensive national legislation on mangroves or wetlands would have several advantages. It would increase the visibility of wetlands, build awareness of their values and vulnerability and, through a suite of measures, incentives and planning techniques adapted to the specificity of wetlands and water systems, would accelerate change in people’s attitudes and behavior in order to promote conservation and wise use more effectively.

It could also be designed to provide a solid legal basis for the establishment of regional and international cooperation with regard to shared water systems, wetlands and migratory species.

As mentioned before, all countries studied are Parties to the Convention on Wetlands of International Importance or Ramsar Convention.

Brazil, Colombia, Costa Rica and Nicaragua have under their jurisdiction a huge area of coastal and marine ecosystems, which cover an area of thousands of square kilometers. However, the number of sites they have designated in the Convention's List of Wetlands of International Importance is relatively small (total 27).⁶² These areas support a wide range of ecosystems, which include coral reefs and mangroves. Therefore, efforts should be made in order to proceed to list further specific sites.

Inappropriate legal regimes for land tenure and resource use contribute to mangrove loss or degradation in many parts of the world. In many countries, mangroves and their resources are classified as State property. There is wide variation in the extent to which exploitation of state-owned resources are controlled.

Too frequently, the absence of defined property rights or management responsibility in mangroves has undermined a sense of stewardship or collective responsibility among local or indigenous peoples.

It is difficult, if not impossible, to establish well-defined property-rights for "public goods" such as wetlands. Usually land tenure related legislation is poorly enforced leading to the pattern of unconstrained resource use that Garret Hardin has called "the tragedy of the commons".

Mangroves still tend to be seen as the land most easily available for industrial development (marinas, port infrastructures and shrimp industry), partly because of the character of strict preservation of these areas as well as the uncertain character of their ownership in most of the cases.

Particularly in areas of high population density, mangrove ecosystems which are freely accessible or under state or private ownership may be at serious risk of overexploitation of extractive resources or, at least, of degradation through negligence or non-management.

To sum up the situation in the countries studied, property of natural resources tends to be reserved mainly for the State. However, there is a tendency to allow private ownership of some natural resources that are strategic for the country. In these cases, the property is conditioned to the observance of a management plan or certain requisites that are stipulated in the award contract. In this way, some ecosystems with wetlands can be privately owned.

All countries in the world, with perhaps very minor exceptions, have now instituted mechanisms to conserve natural ecosystems, biological processes and outstanding landscapes. Marine or terrestrial coastal habitats have however received relatively little attention under national and sub-national legal frameworks.

⁶² Australia itself has designated 57 sites in its territories. Source: www.ramsar.org/index_list.htm. Site visited on 05/06/02.

Some of the countries studied have enacted legislation to protect some of the components of the ecosystem such as forests and fauna, but unfortunately not the ecosystem as a whole, its surrounding areas and associated ecosystems. Thus, the ecosystem approach has not been adopted so far. No doubt this type of legislation at national level can be considered a critical obstacle to the conservation and wise use of mangrove areas.

Despite the great variety of mechanisms established by law to conserve the environment ranging from strict protection to sustainable exploitation, the most used legal mechanism to protect wetlands in the studied countries has been their declaration as natural protected areas. The category assigned in each case varies according to the protected area system of each country, and the allowed uses that arise from the declaration of a protected area. In some cases, wetlands have been placed under strict protection categories resulting not only in the loss or degradation of mangrove ecosystems but also in the denial of mangrove benefits to local populations.

In spite of the good intentions of the legislators, another implication of this statement is that mangroves do not receive special attention of the state due to the fact that an excessively strict legal instrument might not be so efficient because the total protection on paper usually results in a lack of attention in the field.

There is no doubt that sustainable use of coastal resources requires that some areas be retained in their natural state or as near to natural possible. Safeguarding critical habitats for fish production, preserving genetic resources, protecting scenic and coastal areas, and enjoying natural heritage all may require the protective management of natural areas.

A brief diagnosis of the state-of-art of mangrove ecosystem and wetland ecosystems in the system of protected areas in the countries studied, leads to the conclusion that those legal systems should draft specific protected area law for marine ecosystems such as mangroves as a way of recognizing the great value of these ecosystems.

As a recommendation, initially it may be best to start with one or a few protected areas as a trial towards evolving new administrative and management arrangements. International and national non-governmental organizations (NGOs) can offer advice, assistance, and specialists to help develop coastal and marine conservation programs.

However, since the protected area system is not the only legal tool for the conservation of mangrove ecosystems, it should also be recommended to draft specific legal instruments designed to conserve particular types of natural habitats and ecosystems such as mangroves and also laws impacts on them.

Finally, it should be pointed out that the Ramsar Convention advocates the multiple use of wetlands under the wise use banner. Indeed, the capacity to sustain wetland

ecosystems while at the same time sustaining some degree of human use should be promoted in the studied countries at the level of legislation.

The conservation of the environment, the management of natural resources and the design of national wetland policies involve the environmental institutions of each country. The execution of these policies can be delegated to the same institution or to any sector of the State, which in most cases is in charge of renewable natural resources.

The environmental institutions of the studied countries have different levels of autonomy as well as different political and economic decision-making powers. The Ministries of the Environment tend to concentrate more functions and to assume executive roles.

On the other hand, the Councils or Secretariats tend to work more on policy design and coordination of executive organisms.

As a recommendation, the creation of national wetlands commissions should be promoted with the participation of different institutions related to the administration of wetlands with the goal of conservation and sustainable use of such important ecosystems. It has been proven that negotiation between interested parties is a fundamental tool to solve conflicts that arise from management of ecosystem and its natural resources.

The concentration of environmental competencies in only one body with the participation of all interested parties from the government, private sector and civil society facilitates that the design and execution of environmental policies develop in a more organic way.

National agencies usually have access to greater financial resources and expertise and have a more comprehensive view of conservation needs. The national governments usually have jurisdiction over marine waters and should have to be involved in some way in planing and management of natural resources.

In the case of attempting to build and implement an integrated coastal planning, it is known that the artificial division between land and sea is a serious obstacle to the success of this initiative. Even where competent authorities use spatial planning techniques to control coastal land use, they usually have no powers to establish corresponding measures at sea.

Provincial or local planning and management can be more responsive to these difficulties and also to local needs and changing circumstances. A few countries do equip local planning authorities with powers over both land and sea areas. This type of approach can offer a strong basis for integrated planning without the need for major legislative or institutional reform.

There is no doubt that a program of integrated coastal zone management could reduce these institutional deficiencies by addressing solutions to some of the constraints to the conservation of wetlands such as ineffective public management, failed land use planning, weak or non-existent measures to solve pollution problems, scarce institutional resources, and little or no consideration of carrying capacity.

As a recommendation, countries should carry out a legal and institutional review in their legislation, which would reveal inconsistencies and gaps.

As a final conclusion, it may not be necessary, or even desirable, in most of the studied countries to enact specific wetland/mangrove legislation concerning the above mentioned issues, particularly as the enactment of new laws is politically cumbersome and time-consuming. Wherever possible, existing legal mechanisms can be amended or used in new combinations to target constraints to the conservation of mangrove ecosystems.