REGULATIONS IN COASTAL AND MARINE ZONES

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INTRODUCTION

Mexico is facing the most demanding environmental commitment in its history regarding the regulation and protection of its biological diversity not only in terrestrial, but also in coastal and marine environments. Therefore, the Mexican Government has striven to create and keep updated a legal framework applicable to the environment and its natural resources.

Coastal and marine environments constitute a complex and diverse set of terrestrial and aquatic ecosystems including seas, coastal lagoons, the Zona Federal Marítimo Terrestre (ZOFEMAT; Federal Maritime Terrestrial Zone), as well as beaches and reclaimed land. All these are very important due to their influence on social, economic and ecological issues, including the country's foreign policy.

Mexico possesses enormous wealth in its marine ecosystems, which consist of 11,000 km of coastline (Figure 35.1), 500,000 km^2 of continental shelf, 16,000 km^2 of estuarine area and approximately 12,500 km^2 of coastal lagoons, which endow the country with a biological wealth composed of about 300 potentially exploitable species, 25 commercially exploited species and about 33 genera of exotic fish. This provides an estimated annual catch of 1.3 million tons, amounting to potential environmental capital resources above those of several nations (INE 1996).

Significant levels of alteration to coastal and marine ecosystems have been registered concurrently to the economic and social transformations that Mexico has undergone. Therefore, the federal government, through the Secretaría del Medio Ambiente y Recursos Naturales (SEMARNAT; Secretariat of Environment and Natural Resources), has concentrated its efforts on addressing the largest environmental imbalances through actions such as the creation and consolidation of natural protected areas, in addition to the application of various legal instruments pertaining to coastal and marine zones, such as laws, regulations and sectorial programs.

This chapter has the objective of examining the legal provisions that apply to coastal and marine environments, analyzing the concurrence of various pertinent ordinances that regulate issues related to waters, forests, wildlife, fisheries, the ZOFEMAT and reclaimed land, among others. The connection between the legislation and the technical and ecological aspects on which it is based is also analyzed.

Mentioning the regulations applicable to coastal and marine zones and their interrelation with biological diversity implies in carrying out an analysis of the Mexican Constitution and the legislation that sustains conservation and restoration of such ecosystems. The fact that the Mexican legal system needs to be updated and systematized in order to fill regulatory vacuums that prevent proper protection, conservation and management of natural resources in coastal and marine zones is of the highest priority. Such update should include a regulatory framework of cooperation among various sectors, so that they can intervene jointly and according to their respective attributions and competencies to prevent, control and reduce contamination of the marine environment and to preserve and restore ecosystems balance.

Fig. 35.1. Mexican coastal zones. Source: INE (2002)

THE MEXICAN CONSTITUTION

In this section the constitutional framework for the regulation of marine and coastal zones will be reviewed. The contents of Articles 27, 42, 48, 73, 2 and 4 will be analyzed.

ARTICLE 27 OF THE CONSTITUTION

The principle of conservation of natural resources in general is contained in the Constitution of 1917, as a result of the profound changes in the Constitution of 1857 regarding the social function of private property. The property system established in the Constitution of 1917 is based on the premise that in Mexico the ownership of land and water originally belongs to the nation, which is entitled to transfer it to private owners in the form of private property. The nation retains control over the property and the right of expropriation is established by Article 27.

Likewise, Article 27 establishes that the Mexican nation is entitled, at all times, to impose on private property the uses deemed to be in public interest. This clearly establishes the social function of private property. It should be emphasized that, in this point, the Mexican Constitution was ahead of those of many other countries.

Paragraphs 3 and 4 of this article grant to the Mexican nation the inalienable and imprescribable ownership of all natural resources of its soil, subsoil, continental and insular shelves, territorial waters, rivers, lakes, lagoons, marshes and property originating from all land and water within its geographic and legal boundaries. An immediate conclusion from this paragraph is that the Mexican nation is entitled to enact laws and regulations over the use and

protection of these resources.

Other concepts from the 3rd paragraph of Article 27 are linked to the previous, such as the provision by which the Mexican nation is at all times empowered to regulate the exploitation of natural resources that are susceptible of appropriation for the good of society, with the objective of ensuring the fair distribution and conservation of public wealth. Accordingly, this paragraph means that the Mexican nation maintains the right to ensure the conservation of natural resources and confirms the social function of private property, since it makes it clear that attributes pertaining to ownership may be limited in the public interest. The environmental importance of this principle is obvious, since the state's authority to limit certain attributes of private property depends on it.

Following the postulate from the 3rd paragraph of Article 27 of the Constitution, it empowers the state's responsibility for the conservation of natural resources, by stating that "*…with this objective the necessary measures will be taken to... prevent the destruction of natural features and damage to property that will be detrimental to society*."

Clearly, the ideas of the 3rd paragraph of this article regarding the fair distribution of natural resources and their conservation are connected, since the unfair distribution of resources often leads to their deterioration or overexploitation. Moreover, the idea of "resources conservation" does not conflict with the "use of such resources", since the Constitution gives the Mexican nation the right to regulate their exploitation for the well being of the society. This implies that natural resources in Mexico should be used rationally, i.e., in a manner that allows their conservation, as can be deduced from the 3rd paragraph, which gives the state the duty of taking the necessary steps to prevent the destruction of natural resources.

The regulations pertaining to hydrocarbons are established in the same Article 27 of the Constitution, which states that "*petroleum and solid, liquid or gaseous hydrocarbons...*" adding that "*...concessions or contracts shall neither be granted, nor shall those that have been granted subsist, and the nation shall exploit these products under the terms pointed out in the respective regulation.*"

According to Article 8 of the Regulatory Law of the Petroleum Industry, the Federal Executive Branch is empowered to establish petroleum-reserve zones in areas whose petroleum-producing potential is worthy, in order to ensure the country's future supply. The inclusion of new areas in, or removal of existing areas from, such zones must be carried out by presidential decree, based on the respective technical assessments.

The environmental protection from the effects of petroleum-related activities must be analyzed in light of the stipulations of Article 10 of the Regulatory Law of Article 27 pertaining to petroleum, which states that: "*The petroleum industry is of public utility, taking precedence over any other exploitation of soil and subsoil, including collective or communal land ownership, and the Mexican nation is given the right to perform provisional or definitive occupation or expropriation of such lands via legal compensation in all cases required by the Nation or its petroleum industry.*"

It follows from the above that the provisions of the law and its regulations ensure the protection of petroleum resources. Petroleum-related activities are subject to the criteria of sustainability of natural resources, as well as preservation and restoration of ecological balance and environmental protection, contained in the environmental legislation.

Stemming from this article are the Ley General del Equilibrio Ecológico y la Protección al Ambiente (LGEEPA; The General Law of Ecological Equilibrium and the Protection of the Environment) (Diario Oficial de la Federación (D.O.F.), January 28, 1988. Reform: D.O.F.

December 13, 1996), the Ley de Aguas Nacionales (Law of National Waters) (D.O.F., December 1st, 1992) which regulates all matters regarding the use and protection of Mexican water resources, including various aspects relative to its possible contamination, the Ley General de Vida Silvestre (General Wildlife Law) (D.O.F., July 3, 2000), which regulates the conservation and exploitation of wild flora and fauna, and the Ley General de Desarollo Forestal Sustentable (General Law of Sustainable Forest Development). These laws have the objective of regulating and encouraging the conservation, protection, restoration, production, organization, cultivation, management and exploitation of the country's forest ecosystems and their resources, including coastal areas.

ARTICLES 42 AND 48 OF THE CONSTITUTION

In terms of coastal and marine zones it is necessary to become familiar with the areas encompassed by the Mexican territory where the country exercises sovereignty and jurisdictional rights according to Article 42 of the Constitution, which include:

I. The parts that constitute the Federation;
II. The part that comprises islands, including reefs and keys in the adjacent seas;
III. The part comprising the Guadalupe and Revillagigedo Islands, located in the Pacific Ocean;
IV. The continental shelf and the shelves of islands, keys and reefs;
V. Mexican territorial seas as stipulated in the international law and Mexican interior maritime waters;
VI. The land surface of the Mexican territory, as established in the international law.

In addition to the above, Article 48 of the Constitution stipulates that the Federal Government shall have direct control over the islands, keys and reefs located in the adjacent seas that belong to the Mexican territory, the continental shelf, the shelves of islands, keys and reefs, the territorial seas, interior maritime waters and the land surface of the Mexican territory, except for those islands over which the states have exercised jurisdiction up to now.

ARTICLE 73 OF THE CONSTITUTION

The idea of contamination prevention and control was first included in the Mexican Constitution in 1971. Hence, it was also the first time that the Constitution considered the concept of environmental contamination, i.e., the presence in the environment of one or more alien substances at levels exceeding natural concentrations that lead to the degradation of all or part of the environment. Clearly this concept is of the highest importance for environmental protection, since, unless pollution prevention and control activities are carried out it is impossible to achieve such protection.

Environmental protection goes beyond the control and prevention of pollution, since it also includes the protection and rational exploitation of natural resources. However, when this concept was introduced into the Mexican Constitution the prevailing perception, derived from industrialized countries where pollution was the biggest environmental problem, was that the greatest, and perhaps only danger, was related to the noxious effects of contamination. In order to enable the state to take action in such cases, Article 73 of the Constitution was amended and, later, the Ley Federal para Prevenir y Controlar la Contaminación Ambiental (LFPCCA; Federal Law for the Prevention and Control of Environmental Contamination) (D.O.F., March 31, 1971),

whose 3rd Chapter was devoted to the "Prevention and Control of Water Contamination", was promulgated.

The 1971 reform did not suffice to protect the environment, because it did not provide the LFPCCA with the required solid constitutional foundation. This law should not only be a legal ordinance related to the prevention and control of environmental contamination and of its effects on human health, *i.e.*, concerning "general health", but should also encompass environmental protection. Therefore, environmental protection in general needed constitutional support, which could neither be a strictly federal issue, nor only of the health sector.

Subsequently, the Ley Federal de Protección al Ambiente (Federal Law of Environmental Protection) (D.O.F., January 11, 1982) was issued. Like the LFPCCA it has a centralizing character, which runs against the present trends in the country. The 3rd Chapter of this law concerns protection of the marine environment, with strict focus on water pollution and not taking into account the fact that environmental damage can stem from a variety of causes that are not necessarily a direct result of contamination. This law deemed contamination to be a public health problem, for which reason the environment *per se* was not considered to be a matter worthy of special legal protection.

For the purpose of the amendments that were made to Article 4 of the Constitution in 1983 (D.O.F., February 3, 1983), it was determined that the law should provide for joint action by the Federation and its constituent parts with regard to general health. Through this modification an attempt was made to remedy the unrestricted federalization that had resulted from the above mentioned amendments to Article 73.

In 1987, Article 73 of the Constitution was amended by adding Section XXIX-G (D.O.F., August 10, 1987), which empowers the Union Congress to pass laws establishing the joint action of the Federal Government and state and municipal governments, each within the limits of its competency, in matters of environmental protection and preservation and restoration of environmental balance. This paved the legislative way for the promulgation of the LGEEPA and provided the necessary legal foundations for transferring environment-related matters to states and municipalities.

ARTICLE 25 OF THE CONSTITUTION

New reforms of the Mexican Constitution were made in December of 1982, coming into effect in 1983. These had the objective of explicitly incorporating the concept of protecting the environment as a whole through the expression "environmental care". Such reform expanded the concepts already established in Article 27 to include the conservation of productive resources.

Through these reforms the text of the article was modified regarding the country's economic development, to include "*...to support and encourage companies of the social and private economic sector, holding them responsible for operating in a manner befitting the public interest, the general well being and productive resources, ensuring their conservation and that of the environment.*"

Among the points of interest in these amendments is, for instance, the fact that public interest and the conservation of productive resources are placed above private company interests, and that for the first time the word "environment" is included in the Constitution separately from productive resources and its "care" became a constitutional matter.

The ideas contained in this modified Article 25 are linked to those expressed in Article 27, but its domain is somewhat different, since Article 25 refers to company activities. This new

wording is also linked to Article 5, which establishes economic freedom but indicates that it can be subject to restrictions. The text of the 6th paragraph of Article 25 provides the constitutional basis for such restrictions, though this basis had already been foreseen since 1917, in Article 5 of the Constitution.

Although it might initially be thought that Article 25 repeats the stipulations of Article 27, it is in fact broader, since it refers to productive resources in general and not only to natural resources that can be appropriated. It not only mentions the conservation of such resources, but also of the environment in general. Therefore, this is the first amendment that introduces basic environmental concepts into the Constitution.

The amendment to Article 25 of the Constitution, published in the D.O.F.of June 28, 1999, included the basic concept of "sustainability" in national development, which was subsequently complemented by the amendment to the Ley de Planeación (Planning Law) (D.O.F., May 23, 2002). This integrated national development planning with environmental protection and rational exploitation of resources, with the objective of contributing to the change of the country's reality.

ARTICLE 4 OF THE CONSTITUTION

This article forms part of Section 1, Chapter I of the Constitution pertaining to personal guarantees, and establishes every person's right to health protection. It specifies that the law shall define the basic tenets for access to health and establishes the manner in which the states and the Federation shall collaborate for this purpose. The right of every person to an appropriate environment for development and well being was included among the list of so-called individual guarantees of the Constitution (1999 Reform).

THE FOUR CONSTITUTIONAL PERSPECTIVES

From what has been discussed it is clear that, according to the Constitution, environmental protection in Mexico is presently carried out based on the following perspectives:

a) That the State guarantees every person's right to an appropriate environment for development and well being (Article 4).
b) The conservation of natural resources that are susceptible of appropriation (Article 27).
c) The prevention and control of environmental contamination regarding its effects on health (Article 73).
d) The care of the environment regarding the use of productive resources by the social and private sectors, as well as "sustainable" development (Article 25).

As is evident, these four angles are the result of partial and changing ideas concerning the main environmental issues, and were gradually changed as the view of environmental problems and their consequences was modified. The articles of the Constitution that were deemed most suitable were modified to include these concerns, but in no case was a profound reform carried out that would make it possible to deal with these problems in an integrated way.

Stemming from the aforementioned constitutional precepts is a series of regulations regarding issues related to environmental protection and natural resources. Among those the LGEEPA stands out, since it is the legal instrument which regulates matters relating to such subjects in a global manner. Notwithstanding this, the Law of National Waters, the Ley de Pesca (Fisheries Law) (D.O.F., June 25, 1992), the General Law of Sustainable Forest Development,

the General Wildlife Law, the Ley General para la Prevención y Gestión Integral des los Residuos (General Law for Prevention and Management of Wastes) (D.O.F., October 8, 2003), the Ley Federal de Metrología y Normalización (Federal Law of Measurements and Normatization) (D.O.F., July 1st, 1992), the Ley Federal del Mar (Federal Law of the Sea) (D.O.F., January 8, 1986), in addition to containing provisions regarding the exploitation and use of natural resources, include regulations pertaining to the protection and conservation of such resources.

PROGRESS IN THE LEGAL FRAMEWORK

In recent years Mexico has experienced an important strengthening of the legal and institutional framework regarding environmental protection and preservation of natural resources. Although we can find legislative precedents regarding the mentioned issues since the 1920s, it was in 1972, with the passing of LFPCCA that the process of environmental management consolidation began. Such process acquires a special dynamics from 1988 onwards, with the modification of various constitutional rules with the objective of including principles on this subject at the highest regulatory level and the approval of the LGEEPA.

Between 1988 and 1993 environmental laws were passed in all federal entities and in some cases their provisions were regulated at both state and municipal levels. Measures for the protection of natural resources can be traced back to the Ley de Mar Territorial (Territorial Seas Law) of 1902, Ley Forestal (Forestry Law) of 1926, Fisheries Law of 1925, Ley de Caza (Hunting Law) of 1940, and Ley de Águas de Jurisdicción Federal (Law of Waters under Federal Jurisdiction) of 1910. On the other hand, both federal and local public administration have been undergoing important changes with the tendency of consolidating in a single instance the main issues involving the preservation of ecological balance and environmental protection.

The development of Mexican environmental legislation has been as follows:

I. *Stage One. The beginnings of the Mexican environmental legislation*
    1. Constitution (1917)
    2. Article 27: Protection of Natural Resources
    3. Article 73: Prevention and Control of Contamination
    4. Article 25: Care of the Environment
    5. Law of National Waters (1934)
    6. Código Sanitario (Sanitary Code) (1955)
    7. Control of contamination as a public health problem

II. *Stage Two (1970–1982). First attempts to systematize the environmental legislation*
    1. Passing of the first Environmental Law: Federal Law for the Prevention and Control of Environmental Contamination (LFPCCA) (D.O.F., March 31, 1971)
    2. The Subsecretaría de Mejoramiento Ambiental (Subsecretariat of Environmental Improvement) is created (1972).
    3. International Conference on the Environment (Stockholm in 1972) on development and the environment. Ecodevelopment.

III. *Stage Three (1982–1987). Bases for the integration of environmental management*
    1. Federal Law of Environmental Protection is passed (D.O.F., January 11, 1982)
    2. The Secretaría de Desarrollo Urbano (Secretariat of Urban Development) is created (1982)
    3. Article 25 of the Constitution is amended (D.O.F., February 3, 1983)

4. Final report of the World Commission on the Environment and Development, entitled “Our Common Future (1987). Sustainable development.

IV. *Stage Four (1987–1994). Integration and consolidation of environmental legislation*
    1. Reform of Articles 27 and 73 of the Constitution
    2. Passing of the General Law of Ecological Equilibrium and the Protection of the Environment (LGEEPA) (D.O.F., January 28, 1988)
    3. Creation of the Secretaría de Desarrollo Social (SEDESOL; Secretariat of Social Development)
    4. Creation of the Instituto Nacional de Ecología (INE; National Institute of Ecology)
    5. Creation of the Procuraduría Federal de Protección al Ambiente (PROFEPA; Federal Ministry for Environmental Protection)
    6. Passing of local environmental laws
    7. Creation of the Secretaría de Medio Ambiente, Recursos Naturales y Pesca (SEMARNAP; Secretariat of Environment, Natural Resources and Fisheries) (1994)

V. *Stage Five (1995–2001). Restructuring of environmental legislation*
    1. Plan Nacional de Desarrollo (National Development Plan) 1995-2001
    2. Programa del Medio Ambiente (Environmental Program) 1995–2001
    3. Reforms to the LGEEPA of 1996
    4. Incorporation of tax and economic incentives
        i. Incorporation of principles such as “Who contaminates pays”
        ii. Orientation of actions towards contamination prevention
        iii. Improvement of environmental policy instruments

VI. *Stage Six (2001-2003). Current developmental of environmental legislation*
    1. Reforms to the Planning Law (D.O.F., May 23, 2002)
    2. National Development Plan, 2001-2006
    3. Plan Nacional de Medio Ambiente y Recursos Naturales (National Plan for the Environment and Natural Resources), 2001-2006
    4. Programa Nacional Hidráulico (National Hydraulic Program), 2001-2006
    5. Plan Nacional Forestal (National Forestry Plan), 2001-2006
    6. Programa de Procuración de Justicia Ambiental (Program of Procurement of Environmental Justice), 2001-2006
    7. Programa de la Comisión Nacional de Áreas Naturales Protegidas (Program of the National Commission for Protected Natural Areas), 2001-2006
    8. Cruzada por los Bosques y el Agua (Cruzade for Forests and Water)
    9. Cruzada por um México Limpio (Crusade for a Clean Mexico)

LEGAL FRAMEWORK OF MEXICAN SEAS AND COASTS

The various legal ordinances regarding environmental issues at the federal level are described below, with general comments about the features of the local legislation.

FEDERAL LAW OF THE SEA

The Federal Law of the Sea published in the D.O.F. of January 8, 1991, and its regulation from August 21, 1991, establishes that Mexico's marine zones are:

a) The territorial sea
b) Interior maritime waters
c) The contiguous zone
d) The exclusive economic zone
e) The continental and insular shelves
f) Any other zone allowed under international law

This law regulates:

a) Marine installations
b) Marine resources and economic exploitation of the sea
c) Protection and preservation of the marine environment
d) Scientific marine research
e) Mexican marine zones

Likewise, the said ordinance stipulates that "*the exploration, exploitation, utilization, refining, transportation, storage, distribution and sale of submarine hydrocarbons and minerals in Mexican marine zones are subject to the Regulatory Laws of Article 27 of the Constitution in the Area of Petroleum, Mining and their Respective Regulations*" (Article 19).

THE GENERAL LAW OF ECOLOGICAL EQUILIBRIUM AND THE PROTECTION OF THE ENVIRONMENT (LGEEPA)

LGEEPA was published in the D.O.F. of January 28, 1988 and consists of six sections which can be summed up in the following topics: general provisions (Section I); biodiversity (Section II); sustainable use of natural resources (Section III); environmental protection (Section IV); participation by society and environmental information (Section V); control and security measures and sanctions (Section VI).

The main subjects regulated by this law are: environmental impact assessment, ecological regulation, official Mexican standards, protection of the atmosphere, protection of waters, hazardous materials, residues and solids, high-risk activities, noise, protected natural areas, wild flora and fauna in forests and waters, and inspection and surveillance.

Competencies: the law stipulates that distribution is based on three fundamental criteria. The first establishes the essence or nature of the subject to be regulated, the second refers to the territory where the activity is carried out and the third, to the magnitude or potential seriousness of the environmental effects.

Environmental policies: the law establishes the guidelines that should be followed when it is elaborated and the instruments through which the objectives of the established policies are executed both in the National Development Plan and in the National Environmental Program. These instruments refer to: ecological regulation of territories, promotion of development, environmental regulation of human settlements, environmental impact assessment, official Mexican standards, protected natural areas, ecological research and education, information and surveillance.

Protection of natural resources: this is carried out through regulations regarding the establishment of protected natural areas and criteria for the rational exploitation of water and

aquatic ecosystems, soil and non-renewable resources.

Water resources, aquatic ecosystems, soil and non-renewable resources: given that these areas have specific regulations, the LGEEPA concentrates on establishing the criteria that should govern the rational use of each resource, as well as the government measures that should respond to these criteria with no restrictions.

Protection, restoration and improvement of the environment: this is controlled by provisions related to the prevention and control of air, water, aquatic ecosystems and land pollution, as well as by legislation regarding hazardous activities and the production and handling of dangerous substances and residues, nuclear power, noise, vibrations, thermal and photic energy, odors and radioactive contamination.

Inspection and surveillance: the law includes a section entitled "Control and Safety Measures and Sanctions", which establishes the power of the authorities to perform inspection visits and describes the formalities to which such administrative acts are subject. Likewise, it prescribes fines, closure and administrative arrest as sanctions for administrative infringements, contemplating double fines and permanent closure for repeat offenders.

Various regulations stemming from the LGEEPA have the objective of regulating in a specific manner their provisions regarding environmental impact, atmospheric pollution, hazardous residues, noise, automobile-related pollution, marine pollution and land transport of hazardous materials and residues.

The regulations of the LGEEPA regarding hazardous residues have been in effect since November 25, 1988, and will remain in effect until the General Law for Prevention and Management of Wastes is passed. It has three fundamental aspects: standards regarding the production of hazardous residues, as well as their handling, importation and exportation. Very precise provisions regarding storage, transportation and confinement of dangerous residues are also established.

Regulations to Prevent and Control Marine Contamination by Disposal of Wastes and Other Materials

Marine contamination is controlled by the Reglamento para Prevenir y Controlar la Contaminación del Mar por Vertimiento de Desechos y otras Materias (Regulation to Control Marine Contamination by Disposal of Wastes and other Materials), published in the D.O.F. of January 23, 1979. This regulation has the objective of fulfilling the obligations derived from the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter, which regulates deliberate dumping of materials, substances or waste in Mexican territorial waters by ships, airplanes, platforms or other structures.

Likewise, this regulation establishes that a permit must be obtained in order to dump any of the aforementioned materials when there is no other alternative, for which granting the authorities must take into account the criteria pertaining to the effects of the proposed dumping on fisheries resources, human life, marine mineral resources and beaches.

Regulations of the LGEEPA Regarding Protected Natural Areas

One of the strategies to conserve and reverse deterioration trends of Mexican coastal zones and waters is the creation of protected natural areas, which are governed by LGEEPA's regulations on Protected Natural Areas (D.O.F., November 30, 2000). These were established by an order issued by the Federal Executive Branch in accordance with the LGEEPA and other applicable provisions, with participation of the federal and municipal governments, according to the abovementioned ordinance and to local laws in the case of protected natural areas under local jurisdiction.

Orders regarding the establishment, administration, development and surveillance of protected natural areas that are of Federal interest must contain the following aspects, among others:

I. The exact demarcation of the area, indicating the surface area, location, boundaries and, where applicable, the corresponding zoning regulations.
II. The forms of use or exploitation of the natural resources in general or of specific natural resources to be protected in the area.
III. The description of the allowed activities in the area in question and the uses and limitations to which they are subject.
IV. The considerations for public use that will accrue from the expropriation of property by the Nation, when such legal decision is needed for the establishment of a Protected Natural Area. In such cases, the provisions established by the law regulating expropriation, the law of agriculture, and of other applicable ordinances must be observed.
V. The general guidelines regarding administration, establishment of representative member organs, creation of funds or trusts and preparation of a management program for the area.
VI. The guidelines to perform actions regarding preservation, restoration and sustainable exploitation of the natural resources located inside natural protected areas. Guidelines need to address administration and surveillance of such areas, as well as the establishment of administrative rules to govern activities in the areas in question in accordance with the stipulations of the present law and of other applicable legislation.

The measures which may be imposed by the Federal Executive Branch for the preservation and protection of protected natural areas shall be solely those established by the applicable regulations and the present Law, as well as the Forestry Law, Law of National Waters, Fisheries Law, Hunting Law and other applicable legislation.

LEY GENERAL DE BIENES NACIONALES (GENERAL LAW OF NATIONAL PROPERTY)

The objective of the General Law of National Property, published in the D.O.F. of January 8, 1982, is to regulate acts of acquisition, control, administration, transfer of ownership, inspection and surveillance of federal properties. Such federal properties form part of the national wealth, which is composed of federal publicly owned properties and federal privately owned properties (Article 1).

Among the publicly owned properties are those of common use established by the General Law itself, including Mexican territorial waters, interior maritime waters, coastal beaches, the ZOFEMAT, the beds of waterways and the basins of state-owned lakes, lagoons and marshes, the ports, bays, inlets and coves, jetties, docks, breakwaters, sea walls and other publicly used port installations.

Coastal beaches are understood to be those areas that are covered and uncovered by tides, from the lowest to the highest annual tide level (Article 29, Section IV).

When there are beaches along the coast, the ZOFEMAT is composed of the twenty meter-wide strip of land which is passable and borders the beaches, or where applicable, along river banks, from their outlet to the sea to 100 meters upstream (Article 49).

In the case of lakes, lagoons, marshes or natural marine water deposits that communicate

either directly or indirectly with the sea, the twenty meter wide strip of ZOFEMAT is measured from the maximum water level reached during the year or high-water mark (Article 49, Section III). The total surface area of keys and reefs located in territorial seas are part of the ZOFEMAT (Article 49, Section II).

In the event that the ZOFEMAT is partially or totally invaded by water, or that the latter reaches privately owned land adjacent to the ZOFEMAT, such land will be delimitated again in accordance with the stipulations of the aforesaid Law and its regulations. The land that becomes part of the new ZOFEMAT shall cease to be private property, but its legitimate owners shall have priority to receive concessions to them, as stipulated by the law in question (Article 51).

The ZOFEMAT and reclaimed land may not have agricultural use. Therefore, they may not be included in presidential decrees regarding granting, extension or restitution of farmland. Adjacent common lands or communities shall have priority to receive concessions for the exploitation of such properties (Article 55).

GENERAL LAW OF SUSTAINABLE FOREST DEVELOPMENT

The protection of forest resources, including coastal mangroves, is established in the General Law of Sustainable Forest Development, published in the D.O.F. of December 22 and February 25, 2003. This law has the objective of regulating and encouraging the conservation, protection, restoration, production, regulation, cultivation, management and exploitation of the country's forest ecosystems and their resources. It also distributes those competencies among the federation, the states, the Federal District and the municipalities, under the principle of concurrence established by Article 73, Section XXIX, Subsection G of the Mexican Constitution to encourage sustainable forest development. In the case of forest reserves owned by indigenous peoples and communities, Article 2 of the Mexican Constitution shall be observed.

The matters governed by this law include: preventive technical audits, forest certification, transport, the storage and transformation of raw forest materials, changes of forest land-use, forest sanitation, prevention, combat and control of forest fires, conservation, restoration, reforestation, economic instruments of forest improvement and research for sustainable forest development.

This ordinance establishes the foundations for forest policies in the context of the Programa Nacional Forestal (National Forestry Program) 2001-2006, published in the D.O.F. of September 27, 2002. It states that "*The future envisioned for the forest sector in the year 2025 is the guideline for the efforts of both society and the government. This vision brings the understanding that the future is not what will inevitably happen, but rather the product of a collective attitude whereby we clearly imagine what we desire that future will bring and determine the necessary actions to achieve it. Such a vision indicates the main features of the forests sector that we want to build in order to state our long-term commitment to the Mexican society*." This highlights the planning of forest resources exploitation through the use of tools such as the National Forest Inventory, and the zoning of forests so as to encourage sustainable development.

One of the fundamental objectives of the General Law of Sustainable Forest Development, published in the D.O.F. of February 25, 2003, is to strengthen the management capability of the federal, state and municipal governments. Hence, the Servicio Nacional Forestal (National Forestry Service) was created with the objective of joining efforts, processes, instruments, policies, services and institutional actions to give efficient, concerted attention to

the forest sector. The federation, the states and the municipalities will establish the coordination basis for its integration.

The General Law of Sustainable Forest Development is linked to the LGEEPA to reconcile, in a single document, the authorizations for the exploitation of forests and their resources with the environmental impact of projects and activities of federal competency. This has the objective of facilitating the administrative management of private individuals by the federal authorities under the guidance of a program of administrative simplification.

FISHERIES LAW

Similarly, the Fisheries Law published in the D.O.F. of June 25, 1992 and its regulations published in the D.O.F. of September 29, 1999 both regulate the natural resources that comprise aquatic flora and fauna. They have the objective of ensuring the conservation, preservation and rational exploitation of fisheries resources and of establishing guidelines for their appropriate development and management.

This law regulates: commercial fisheries, promotion of fisheries, educational fisheries, sports and recreational fisheries, fisheries for domestic consumption, commercial aquaculture, promotion of aquaculture, educational aquaculture, aquatic sanitation, fisheries methods and arts, legal origins and sanctions.

GENERAL WILDLIFE LAW

In Mexico, responsibility for the conservation, protection, exploitation and development of wild flora and fauna is shared among the federal, state and municipal governments within their respective competencies, in accordance with the General Wildlife Law. The objective of this law is to establish the respective responsibilities of the different government levels regarding the conservation and sustainable exploitation of wildlife and its habitat within Mexico and in areas under Mexican jurisdiction.

Wildlife is defined as: "*Organisms that subsist under natural evolutionary processes and develop freely in their habitat, including smaller populations and individuals under human control, as well as feral.*" (Section XLI, Article 3).

The General Wildlife Law stipulates that activities of conservation and sustainable exploitation of wildlife will respect and maintain the knowledge, innovations and practices of rural communities involving traditional lifestyles relevant to the conservation and sustainable exploitation of wildlife and its habitats. The broader application of such knowledge, innovations and practices shall be encouraged with the approval and participation of those possessing or applying them. Likewise, the benefits derived from the use of such knowledge, innovations and practices shall be divided equitably.

The General Wildlife Law empowers the SEMARNAT to organize inspection and surveillance organs to ensure that its provisions are met. Federal, local and municipal authorities should work together to meet the objectives of the law, as well as for the promotion of specialized education and knowledge necessary for the preservation and improvement of wildlife development.

This Law regulates: the registration and operation of Environmental Management Units, the approval of management plans, phytozoosanitary control, handling of exotic species, measures regarding dignified and respectful treatment, types of exploitation, legal origin,

transfers, importation, exportation and sanctions.

Consistently with the above, SEMARNAT has issued the Norma Oficial Mexicana (NOM; Official Mexican Standard) NOM-SEMARNAT-059-2001, published in the D.O.F. of March 6, 2002, with the objective of identifying endangered wildlife species or populations in Mexico. This will be achieved through the integration of corresponding lists and the establishment of inclusion, exclusion or change of risk categories for species or populations, based on a method that evaluates their risk of extinction.

LAW OF NATIONAL WATERS

The regulation of water use and exploitation is established in the Law of National Waters, which came into effect on December 1st, 1992, and its corresponding regulations, which were published in the D.O.F. of January 12, 1994. The body of law comprised by these two pieces of legislation establishes the provisions concerning the use and exploitation of national waters and their distribution, control, quality and quantity.

This Law regulates: water administration, hydraulic programming, usage rights, regulated, interdicted or reserved zones, water usage, prevention and control of water contamination, investment in hydraulic infrastructure, and fines, sanctions and resources.

LAW OF MEASUREMENTS AND NORMATIZATION

The Law of Measurements and Normatization, published in the D.O.F. of July 1st, 1992, regulates the principles, mechanisms and aspects to be observed by organs that are empowered to develop the official Mexican standards, which establish the specifications and characteristics of products, processes and services that may represent a risk to the environment. These legal instruments establish the pollution limits permitted in all environmental spheres and stipulate which activities, installations or services are mandatory for environmental protection.

At present, four official Mexican standards are in place concerning residual-water quality, five pertaining to the atmosphere, thirteen for point -source emissions, ten regarding nonpoint-source emissions, two concerning fuel quality, ten regarding hazardous residues, one for municipal wastes, four concerning noise pollution, seven regarding environmental impact, fifteen for forest issues, one concerning pest control, four regarding soils and six for species protection. All were updated on August 15, 2003 (SEMARNAT 2006).

LOCAL LEGISLATION

At the local level, the 31 states of the Mexican Republic set in motion legal procedures aimed at passing state ecology laws in 1988. To date all states have passed one law in this area and most count with regulations pertaining to such law, mainly regarding environmental impact and air pollution. Municipalities have included regulations regarding disposal of domestic residues, green areas, etc., in their policies and good governing proclamations.

It should be emphasized that state environmental laws contain provisions which constitute extensions of the stipulations of the LGEEPA at the state level. The legislative measures adopted by the local congresses generally pertain to the distribution of competencies, education and ecological information, rational exploitation of resources, participation by society, air, water, soil, noise, light and noxious-odor contamination, as well as solid residues.

Currently, with the passing of the general laws the states will have the task of passing their own local laws in these matters.

CONCLUSIONS

Clearly, actions taken in Mexico to pass environmental legislation and related laws, such as the Law of National Waters, have never been based on an integral, up-to-date vision of what the environment is. Hence, both the constitutional and specific laws that form the Mexican environmental legislation consider the environment in a fragmented and partial way. As might be expected, these problems are reflected across the whole spectrum of Mexican environmental law and originate many of the deficiencies that have been identified in the first laws pertaining to the environment and in the current legislation.

When these approaches are analyzed as a whole, the main deficiencies of the Mexican legal system stand out. In particular, the following aspects are worthy of note:

1. Legislation of sectorial character regarding the use, protection, conservation and exploitation of a given natural resource (Fisheries Law, General Wildlife Law, Law of National Waters, etc.).
2. Absence of an environmental law framework regarding the use and conservation of maritime zones and coastal areas, and according policies. Few Mexican policy makers have tackled this issue in depth.
3. Absence of clear administrative procedures for the proper application of ecological standards. Each examined law regulates a specific natural resource related to the topic in question, establishing its own procedures which, often, do not extend beyond administrative sanctions and without technical and legal systematization. This prevents linkage between the various legal instruments that, either directly or indirectly, govern this area.
4. Coordination of competencies in environmental matters among the federal, state and municipal levels of government. It is necessary to establish channels to take concerted action within the three levels of government, to exert complete protection of marine and coastal zones within the competencies of each of the protagonists related with the problem.
5. Absence of order and systematization in the environmental legislation. Legal reforms in this sphere respond to a legal project and a broad-ranging interpretation of the environment and of the existing legal ordinances.

In conclusion, although Article 27 of the Constitution includes pioneering ideas regarding the protection of natural resources, these ideas have not been subsequently developed in a consistent manner that would consider the experience of other countries, particularly regarding regulations of coastal zones. Mexico still lacks sufficiently strict, broad and complete regulations regarding the management of coastal environments including the sea, beaches, the ZOFEMAT and reclaimed land.

A critical analysis of other topics will turn up gaps that, in practice, prevent the Mexican legislation concerning coastal and marine zones from having the necessary strength.

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