



**Priorities for Reinforcing Environmental Management
Capacities in Mexico**

Commission for Environmental Cooperation

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1. Introduction

For the purpose of obtaining more and better information on Mexico's capacity building needs in relation to environmental issues, the Commission for Environmental Cooperation (CEC) conducted the study "Priorities for Capacity Building in Environmental Management in Mexico, in Support of the North American Agreement for Environmental Cooperation." The study has also provided valuable information on possible actions to be taken by the CEC in Mexico. This document entitled "Priorities for Reinforcing Environmental Management Capacities in Mexico" was elaborated on the basis of information reported in the study, and with the objective of developing a strategy for defining the Commission's actions in this area.

In addition to analyzing the environmental and social situation in relation to priority areas within the management of environmental problems in Mexico, this document also provides a better understanding of the interests of national and international donor and funding agencies with respect to the environment. This will facilitate the effective implementation of the CEC's cooperative programs, and the providing of adequate cooperative resources for achieving all the objectives proposed. In this way, despite the CEC's limited resources, it will be able to carry out concrete actions that will promote cohesion in the primary flows of international funding in support of environmental management in Mexico, and will attain strategic importance.

2. Description of the Demographic, Economic and Social Situation in Relation to Priority Areas in Environmental Management in Mexico

As we begin a new century, it is evident that the depletion and degradation of Mexico's natural resources could seriously affect the development and well-being of the country's current population as well as future generations. The persistence and intensification of many processes of environmental degradation are the result of structural causes related to the country's history and its reality as a developing country experiencing serious problems such as poverty, a weakened legal system, educational deficiencies, technological backwardness, and demographic pressures. In addition, however, there are a number of institutional problems that have clearly added to this situation and must be acknowledged. If these problems can be overcome, Mexico will position itself on a new path toward environmental management and sustainability.

2.1 Demographic Dynamics, Urban and Rural Population, and Population Distribution

During recent decades, the country's population has more than doubled, from 42.1 million in 1965 to 97.5 million in 2000.¹ While growth rates are lower than in the past, it is predicted that the population will keep on growing, until it stabilizes around the year 2030 with an estimated 130 million inhabitants.²

Mexico's rural population³ has grown during the last 30 years at an annual rate of 0.7%.⁴ This growth trend has provoked environmental impacts, as well as changes in land use, expansion of land dedicated to ranching, and the reproduction of patterns of marginalization and poverty. The country's urban population, for its part, increased from 51.4% of the total population in 1980, to 65.4% in 1990, and it is estimated that it will account for 71.5% of the national total by the year 2010.⁵ Current migratory patterns are no longer directed toward Mexico City and its metropolitan area, but are rather oriented more intensely toward the US-Mexico border zone, and some areas with dynamic economic development, such as Quintana Roo and Baja California Sur. The environmental impacts of these

¹ INEGI, *Resultados del Censo de Población y Vivienda 2000*, INEGI.

² Jarque, C. (1999), "Recursos Naturales y Territorio: México en el Siglo XXI," in Millán J., and Alonso, A. (2000), *México 2030, Nuevo Siglo, Nuevo País*, Mexico, FCE.

³ According to the definitions used by the National Population Council (*Consejo Nacional de Población—Conapo*), the population in towns or cities with at least 2,500 inhabitants is considered "urban," and the population in communities of less than 2,500 inhabitants is considered "rural."

⁴ Conapo (1998), "Los Desafíos Demográficos de México en el Nuevo Milenio," in *La Situación Demográfica de México*, Mexico, 1999.

⁵ Lemus, M. (1996), *Ciudades Mexicanas*, Fundación Mexicana XXI Luis Donaldo Colosio.

migratory flows depend on the availability of natural resources such as water, and the relative fragility of ecosystems in the different regions.

2.2 Economic Overview

In 1998, the Mexican economy ranked 15th with a Gross Domestic Product (GDP) of US \$402 billion, 339 million.⁶ In the last few years, the principle macroeconomic variables have been maintained at satisfactory levels, and the economy is now less volatile and sensitive to speculation and to outside forces, such as political uncertainty or the behavior of the international economy. Inflation has been maintained at acceptable levels, public finances have been managed responsibly, and the relationship between the public deficit and the GDP has been brought to an acceptable range. At the same time, monetary policy has been coherent, and has kept the exchange rate relatively stable. Nevertheless, export activity has been concentrated in only a few productive sectors and limited to certain geographic areas, and has not therefore managed to generate more job opportunities, or to improve income levels for the majority of Mexicans.⁷

2.3 Social Overview

In terms of income distribution among the various sectors of the population, it can be observed that in the period from the late 1960s to the late 1980s, the wealthiest 20% of the population enjoyed between 58% and 65% of the total income, while the poorest 20% had between 2.4% and 3.4%. This illustrates that economic growth has not led to a reduction in the gap between the rich and the poor.⁸

During the period of sustained economic growth between 1935 and 1980, there was a reduction in poverty, but from 1981 to the present, it had sharply increased.⁹ According to the National Solidarity Program (*Programa Nacional de Solidaridad—Pronasol*),¹⁰ from 1981 to 1987, the percentage of the population living in poverty increased from 45% to 50.9%,¹¹ and this trend has not changed.

More recent official estimates reveal that 40 million Mexicans live in poverty, and of those, 27 million survive in conditions of extreme poverty.¹² Until very recently, the environmental dimension was not explicitly considered in relation to poverty, or at best, it was given only marginal attention when designing government strategies for fighting poverty. In the last few years, however, the sustainability principle has been increasingly incorporated into government programs.¹³

⁶ Banamex-Accival (1998), *México Social 1996–1998*, Mexico.

⁷ Economic globalization promoted by the liberalization of markets and the application of an accelerated technological revolution has led to uneven economic development. The regions incorporated into the market are those having an advantageous location, access to raw materials, and a labor force that is large enough and characterized by flexible terms for establishing wages. However, important regions with significant populations have been left out, thus increasing the numbers of persons living in poverty. *Idem*.

⁸ Banco de México, “Encuesta sobre Ingresos y Egresos de los Hogares,” 1987.

⁹ Despite the controversy among experts regarding how to measure poverty and the resulting differences in figures given, there is agreement among authors as to the trends observed.

¹⁰ Pronasol is a program implemented during the presidential term of Carlos Salinas de Gortari (1988–1994) that proposed “joining the cause of others, taking part in actions for the benefit of others, while carefully organizing and managing resources. It is a way of interacting with the society that has always been characteristic of *campesinos*, workers, indigenous communities and families. The Mexican government recognizes the value of Solidarity in the fight against extreme poverty....” See: Presidencia de la República Mexicana (1989), *Programa de Solidaridad*, Mexico.

¹¹ Programa Nacional de Solidaridad (1990), “El Combate a la Pobreza,” *El Nacional*, Mexico.

¹² SEDESOL, Programa de Educación, Salud y Alimentación, Mexico.

¹³ The Program to Fight Poverty (*Programa para Combatir la Pobreza*) 1995-2000 proposes facilitating changes in productive systems by promoting a tradition of preservation and rational use of natural resources. It is based on the principle that there are rights and obligations implied in the ownership and use of the land. See Lichtinger, V., and Ojeda, O., (1999), “*La Política Pública, los Arreglos Institucionales y Presiones Ambientales en México: Una Visión Prospectiva*,” in Millán, J. and Alonso, Antonio (2000), *op cit*.

3. Environmental Problems in Mexico

The processes of environmental degradation confronted in Mexico are threatening the long-term viability of the population's development, well-being and quality of life, as well as the survival of countless species and ecosystems. The primary environmental impacts are in the areas of water, forestry resources, air quality and biodiversity, and they are mostly produced by the agricultural, cattle raising, industrial, energy and tourism sectors. In addition, the inevitable urbanization process has also brought alarming consequences for environmental quality.

3.1 Water Problems

In Mexico, the problem with regard to water is not a matter of the available amount per capita, but rather the uneven distribution of this resource.¹⁴ Around 50% of available water is concentrated in 10% of national territory, while the other 90% of the land is arid. Water has already become scarce in a number of regions, leading to intense competition for this resource. The total amount of available water is 463 km³, of which an approximate amount of 79.4 km³ is consumed.¹⁵ Water use is divided in the following way: agricultural irrigation, 76%; domestic use, 17%; industrial use, 5%; and aquaculture and electricity generation, 2%.¹⁶

Data provided by the National Water Commission (*Comisión Nacional del Agua*—CNA) reveal that of Mexico's 294 hydrological zones, 197 of them—containing 67% of the country's aquifers—are overexploited.¹⁷ These are the same regions that are major agricultural producers, as well as the most productive and competitive in terms of goods for direct or indirect exporting.

The wastewater discharge—from urban, industrial and agricultural sources—reaches significant figures, with a total annual discharge of 20 km³. The division among the three sources is the following: agriculture contributes 62% of total wastewater, followed by the residential sector with 28%, and industry with 10%.¹⁸

In Mexico, the amount of wastewater treated is very low. For example, 82% of wastewater in municipal districts is not treated, thus polluting surface and underground water. About 22% of total wastewater is not even channeled into drainage systems. Industry generates an annual total of 3.2 km³ of wastewater that contains three million tons of pollutants, and 87% of this amount does not receive any treatment.¹⁹

Some solutions implemented by the government to help resolve the problem of water availability are: decentralization of water management, passing more responsibilities on to municipal governments;²⁰ charging for

¹⁴ Mexico has less water than the US, Canada or Brazil; but more than France, China or Japan. Its availability per capita is approximately 5,000 m³/year, but its distribution is irregular, both seasonally and geographically. Semarnat Document (2001), *Cruzada por el Agua y el Bosque* (manuscript).

¹⁵ According to official estimates, by the year 2020, the demand for water consumption will reach a level of approximately 100 km³—with an estimated population of 141 million, an economic growth rate of 3% of GDP, industrial development accounting for 22% of the GDP, only minimal improvements in the efficiency of agricultural irrigation distribution, and low crop productivity. CESPEDES (1998), *Eficiencia y Uso Sustentable del Agua en México: Participación del Sector Privado*.

¹⁶ Semarnat (2001), *op cit*.

¹⁷ It is estimated that by the year 2030, there will be three times more overexploited zones.

¹⁸ Semarnat (2001), *op cit*.

¹⁹ Semarnat (2001), *op cit*.

²⁰ The municipal governments are responsible for services related to sewage systems and potable water supplies. They are also involved in granting concessions and issuing discharge permits. However, in recent years, independent operating entities have been established, with the aim of providing urban water services on a commercial basis. These entities have not been very successful, as they are facing financing problems. CESPEDES (1998), *op cit*.

water consumption;²¹ and programs for sound water management through the creation of Basin Councils (*Consejos de Cuenca*).²²

With regard to the problem of water pollution, the CNA started the Clean Water Program, to guarantee the bacteriological quality of water for direct human consumption, and of commercially sold bottled water and ice. It also initiated a basin clean-up program, for improving the sanitary conditions of national rivers and lakes. This program is one of Semarnap's (currently Semarnat's) priorities, and includes the following bodies of water: Chapala Lake, Patzcuaro Lake; Chacahua Lagoon and the Nitchupte Lacustrine System.

3.2 Forestry Problems

In Mexico approximately 55 million hectares are covered with forests, accounting for about 25% of the national territory. However, deforestation is taking place at an alarming rate, with estimates ranging from 370,000 to 1.5 million hectares per year.

The main causes of deforestation include: wildfires; poverty in rural areas; ambiguous property rights; agricultural policies that promote a view of forestry resources as not being important; lack of adequate support and incentives; and a forestry industry characterized by a short-term vision, ecological deficiencies, and very low productivity.

Today, no more than 800,000 hectares remain in the Lacandon region,²³ the Chimalapas region, in some isolated, remote spots in Veracruz, and in other parts of Oaxaca. The worst scenario is for the forests in southern Mexico, where deforestation takes place at an annual average rate of 1 or 2%, signifying their disappearance in just over 50 years.²⁴

3.3 Air Quality Problems

In terms of air pollution in Mexico, zones with the worst pollution are industrial corridors and metropolitan areas.

In 1997, annual emissions of sulfur oxides (SO_x) and nitrogen oxides (NO_x) by the different sectors of the economy reached levels of 2.2 million tons and 1.5 million tons, respectively. The sectors responsible for the highest SO₂ emissions are: electricity, transportation and the industrial sector; and for the highest NO₂ emissions: transportation, electricity and then, industry. Based on these results, Mexico has a relatively high level of emissions per GDP unit, but a low level in emissions per unit per capita, in comparison to countries belonging to the OECD.²⁵

Transportation is responsible for major emissions of NO_x, HC and CO; while eolian erosion and traffic on unpaved roads are the main causes of suspended particle emissions. However, measures implemented in the transportation sector since 1990 have reduced HC, SO_x, CO, and lead emissions.

Carbon dioxide (CO₂) emissions from energy production have increased, and continue to do so at a rate of more than 3% a year. In 1995, the total for this type of emission was estimated at more than 3.2 billion tons. The CO₂ emissions from energy production per GDP unit in Mexico reach a level of 0.66 tons per US \$1,000, close to the

²¹ Residential, industrial, electrical, aquacultural, and recreational sectors pay a fee depending on the availability zone they are located in. However, the agricultural sector, which has the highest consumption, and small communities usually pay nothing. *Ley Federal de Derechos en Materia de Agua* (1998).

²² The main objective of these Councils is to contribute toward the use and preservation of hydraulic resources in hydrological basins, and to promote the sound and sustainable use of water through hydraulic planning and regional management based on consensus. Semarnap (1998), "Programa de Trabajo 1997," Mexico.

²³ One of the worst cases of the destruction of ecosystems that are vital for the nation's future potential is the Lacandon Forest, where the area covered by forest has been reduced by half in less than a decade: from 850,000 hectares in 1993 to 421,000 hectares in 1999. See G-25, Grupo de Reflexión, *Incendios Forestales y Deforestación: Problema Urgente de Seguridad Nacional*. May 12, 2000.

²⁴ Semarnap (1997), *Programa de Trabajo 1997*.

²⁵ OECD (1997).

OECD average of 0.65 tons. The rate of emissions per capita, 3.5 tons, is considerably below the OECD average for 1995, at 10.9 tons.²⁶

3.4 Biodiversity Problems

In the area of biodiversity, Mexico is included in the list of the 12 countries with the most biological diversity. Given the deterioration of Mexico's ecosystems, however, it is also included among the 15 areas considered to be *hot spots* or under serious threat.

The main causes of biodiversity loss in Mexico are related to the expansion of agriculture and ranching; unsound practices in ranching and forestry; illegal traffic of certain species and the short-sighted introduction of exotic species; urban sprawl; irresponsible hunting practices; and the unregulated development of services infrastructure—all endangering the survival of many wildlife species.

3.5 Industrial Problems

In Mexico, industrial activity has played a key role in economic and social development, accounting for 26.7% of the GDP, and generating 28.1% of the country's total employment.²⁷

Approximately 62% of the industrial portion of the GDP is generated by large companies, while 38% is generated by micro, small and medium-size productive units. The structure of the country's industrial GDP is composed of the following sectors: metal products, machinery and equipment; food, beverages and tobacco; construction; and chemical, petrochemical and plastic, with 21.5%, 19.36%, 14.63%, and 12.17%, respectively. The industrial sector produces 84% of total exports. During the last ten years, the proportion of the GDP represented by industrial exports has increased from 6% to 24%.²⁸

The environmental impact of industrial development in Mexico has been considerable, and it will continue to play a major role in environmental problems.²⁹ Industry is responsible for 14% of greenhouse effect emissions; 3% of water consumption; and 10% of wastewater discharges (with the agriculture and cattle ranching sector ranking first in the latter area). In terms of hazardous wastes, the industrial sector generates the majority. Finally, its contribution to air pollution (particles emissions) is 2.8% (much lower than for agriculture).³⁰

3.6 Urban Problems

In Mexico, the population living in cities with more than a million inhabitants—after remaining at the same level since 1960—decreased during the 1980s. At the same time, the population living in small and medium-size cities³¹ increased, thus generating a more balanced distribution of the urban population.

At the end of 1999, 86.7% of the nation's population had potable water service. In urban areas, about 67.6 million persons now have access to this service. As for sewage services, 72.6% of the nation's population has this service. It is estimated that the volume of wastewater from urban areas is 231 m³/s, of which only 174 m³/s is piped into sewage systems. This information emphasizes the importance of making progress in both installations for water

²⁶ OECD (1997).

²⁷ INEGI (1998).

²⁸ INEGI (1998), *Cuentas Nacionales*, Mexico.

²⁹ Historically, many of the industrial facilities responsible for the worst environmental impacts have been those under governmental control—which have remained under inefficient commercial protection schemes—and especially those that are monopolies subjected to union interests. Therefore, ecological degradation provoked by the industrial sector can be explained by: protectionism, bureaucratic State control, absence of competitive pressure, and the predominance of unions that are linked to the State, protected by obsolete labor legislation, and characterized by *corporativism* and logic based on confrontation between capital and work. CESPEDES (1998).

³⁰ CESPEDES (1998), *Competitividad y Protección Ambiental: Iniciativa Estratégica del Sector Industrial Mexicano*.

³¹ Having 15,000 to 100,000 inhabitants, and having 100,000 to up to one million inhabitants, respectively.

management and provision, as well as in wastewater treatment processes, since only 43 m³/s of wastewater is currently treated.

In terms of solid wastes, the total generated in 1996 was estimated at 87,560 tons per day, or 31 million tons per year, equivalent to 0.917 kg a day per capita.³² Waste management is inefficient, since only about 70% of total waste is collected, while the rest is left on the streets and in empty lots, or disposed of in illegal dumps, river beds, ravines or other water bodies in urban areas. Even though about 70% of total waste generated is collected, only a small percentage—approximately 21%—is deposited in sanitary landfills, while between 73% and 83% is disposed of in open dump sites. It is estimated that only 5% to 6% (by weight) of total waste is recycled, including products such as paper, cardboard, glass and metals.

As for treatment, the number of facilities or landfills for depositing solid wastes increased from 74 in 1991 to 92 in 1996, with a daily capacity of 7,000 and 11,000 tons, respectively. Sedesol reports that in 1991 there were 13 controlled sites with a capacity for processing 4,528,000 tons of waste, and in 1996, the number of sites had increased to 31, with a capacity for 8,573,000 tons. As for uncontrolled sites, they have varied from 61 in 1991, to 71 in 1994, and back down to 61 in 1996. These sites have an estimated daily capacity for 2,606,000 tons.

3.7 Energy Problems

During recent decades, energy consumption in Mexico has increased faster than the GDP. Between 1985 and 1995, final energy consumption increased by 18.5%, while growth in the GDP was 10.6%. Energy consumption per capita is considerably below the levels of other OECD countries, and energy intensity³³ is above the group's average.

Between 1990 and 1996, Mexico's proven hydrocarbon reserves decreased from 66.45 to 62.05 billion barrels. At the production rhythm maintained during recent years, this means a decrease from 53 to 48 years in terms of duration. More than two thirds of the current reserves are oil; 21%, dry gas; and 11%, natural gas. To date, only the natural gas sector has been opened to competition, while electricity generation and fuel supply in general are still under centralized management, with negative consequences for public finances, the system of incentives for the sector's technological reconversion, and efficient management of resources. It should be noted that the development of renewable energy has not been included in environmental policy agendas, despite the significant long-term potential of this kind of energy for improving the air quality and reducing greenhouse emissions.

3.8 Tourism-related Problems

Mexico currently ranks eighth among the most popular tourist sites in the world, and 16th in terms of the income generated.³⁴ Tourist activity generates income and employment, and it is estimated that tourism currently accounts for approximately 9% of the country's total employment.³⁵

The proportion of the GDP originating from tourism has been maintained at approximately 8% in recent years, with a rising trend in the last decade. In 1998 it reached a level of 8.4% of the GDP, contributing just over 30 billion dollars. With these figures, tourism has become consolidated as the most important area within the services sector, accounting for more than 65% of this sector's national product, and 60% of its total employment.

The environmental impacts generated by tourism activities have increased and diversified in such a way that the most serious threats are currently related to habitat modification and destruction.³⁶

³² In most countries, municipal solid waste volume is growing rapidly. In the late 1980s, the average in OECD countries reached an annual rate of 513 kg/inhabitant.

³³ Energy consumed per product unit. It is also defined as the total supply of primary energy divided by the value of the GDP, usually corresponding to tons of crude oil in thousands of dollars. This is an indicator that reflects the preponderant use of fuels in productive activities. INEGI (1997), *Estadísticas del Medio Ambiente*, Mexico.

³⁴ Sector (1999), *Indicadores del Sector Turismo*, Mexico. Also, the tourism industry has maintained its position as the third most important in terms of national income generated, after the oil and manufacturing industries.

³⁵ During 1998, tourism generated 1.8 million jobs, almost 5% more than it generated in 1994.

³⁶ Mangrove areas and other wetlands are frequently cleared and filled; estuaries disappear when huge tourist complexes are built, transforming or eliminating entire natural systems.

4. Development of Environmental Policy in Mexico

The history of Mexico's environmental policy is relatively recent, since it was developed as such only during the last two decades of the 20th Century. Nevertheless, Article 27 of the Constitution of 1917 establishes the basis for its development, by conditioning the use of natural resources to national interests.³⁷

It was not until the 1970s, however, that environmental management acquired a character of its own, when the Undersecretariat for Environmental Protection (*Subsecretaría de Protección al Ambiente*) was created within the Secretariat of Health and Welfare (*Secretaría de Salubridad y Asistencia*),³⁸ with the legal framework provided by the Federal Law for Preventing and Controlling Environmental Pollution (*Ley Federal para Prevenir y Controlar la Contaminación Ambiental*) of 1971.³⁹

In the early 1980s, with the reforming of Article 25 of the Constitution, the concept of taking care of the environment was first introduced.⁴⁰ In 1982, the Undersecretariat of Ecology (*Subsecretaría de Ecología*)⁴¹ was created within the Secretariat of Urban Development and Ecology (*Secretaría de Desarrollo Urbano y Ecología—Sedue*), which was the first institution to include environmental protection among its objectives. In the same year, the Federal Law for Preventing and Controlling Environmental Pollution (*Ley Federal para Prevenir y Controlar la Contaminación Ambiental*) was modified, and transformed into the Federal Law for Environmental Protection (*Ley Federal de Protección al Ambiente—LFPA*). Under the latter, important standards were established for the conservation, protection, preservation, enhancement and restoration of the environment and natural resources, and for the prevention and control of pollutants and their true causes.

Beginning in 1994, the Secretariat of Environment, Natural Resources and Fisheries (*Secretaría de Medio Ambiente, Recursos Naturales y Pesca—Semarnap*), currently the Secretariat of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales—Semarnat*), took responsibility for promoting the transition to sustainable development. Semarnap is integrated by 5 decentralized entities that assist in this task, namely: the National Water Commission (*Comisión Nacional del Agua—CNA*), the Mexican Institute of Water Technology (*Instituto Mexicano de la Tecnología del Agua—IMTA*), the Federal Attorney General for Environmental Protection (*Procuraduría Federal de Protección al Ambiente—Profepa*), the National Institute of Ecology (*Instituto Nacional de Ecología—INE*), and the National Fisheries Institute (*Instituto Nacional de la Pesca—INP*).

³⁷ Article 27 states: "...corresponding to the nation is the direct dominion of all the natural resources of the continental shelf, the underwater insular shelf..." Political Constitution of the Mexican United States, Federal Executive Power, Environmental Program 1995-2000, Mexico.

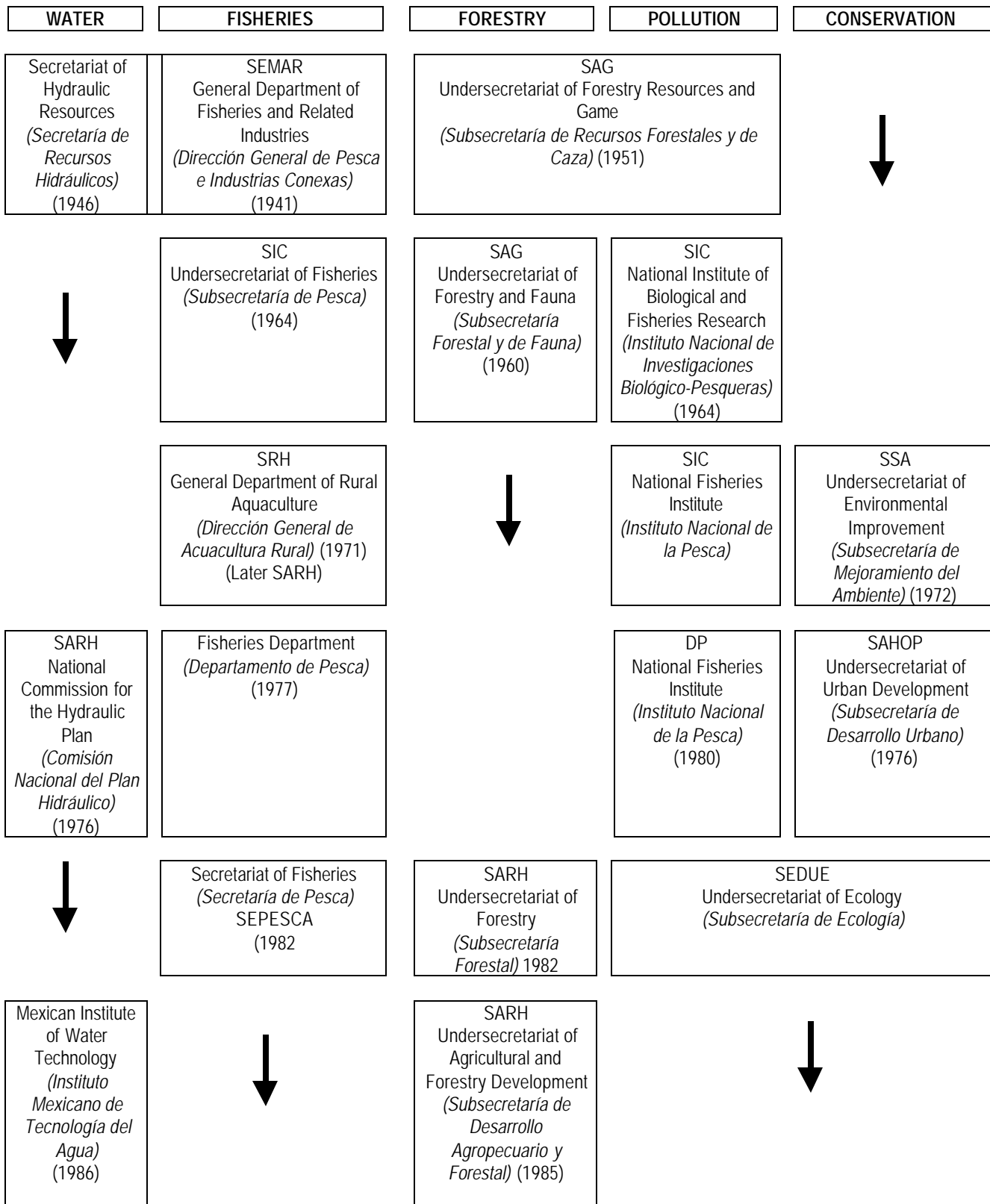
³⁸ This Undersecretariat was only responsible for environmental issues, while other matters such as national parks and natural protected areas were under the jurisdiction of the Secretariat of Human Settlements and Public Works (*Secretaría de Asentamientos Humanos y Obras Públicas—SAHOP*) and the Secretariat of Agriculture and Hydraulic Resources (*Secretaría de Agricultura y Recursos Hidráulicos—SARH*).

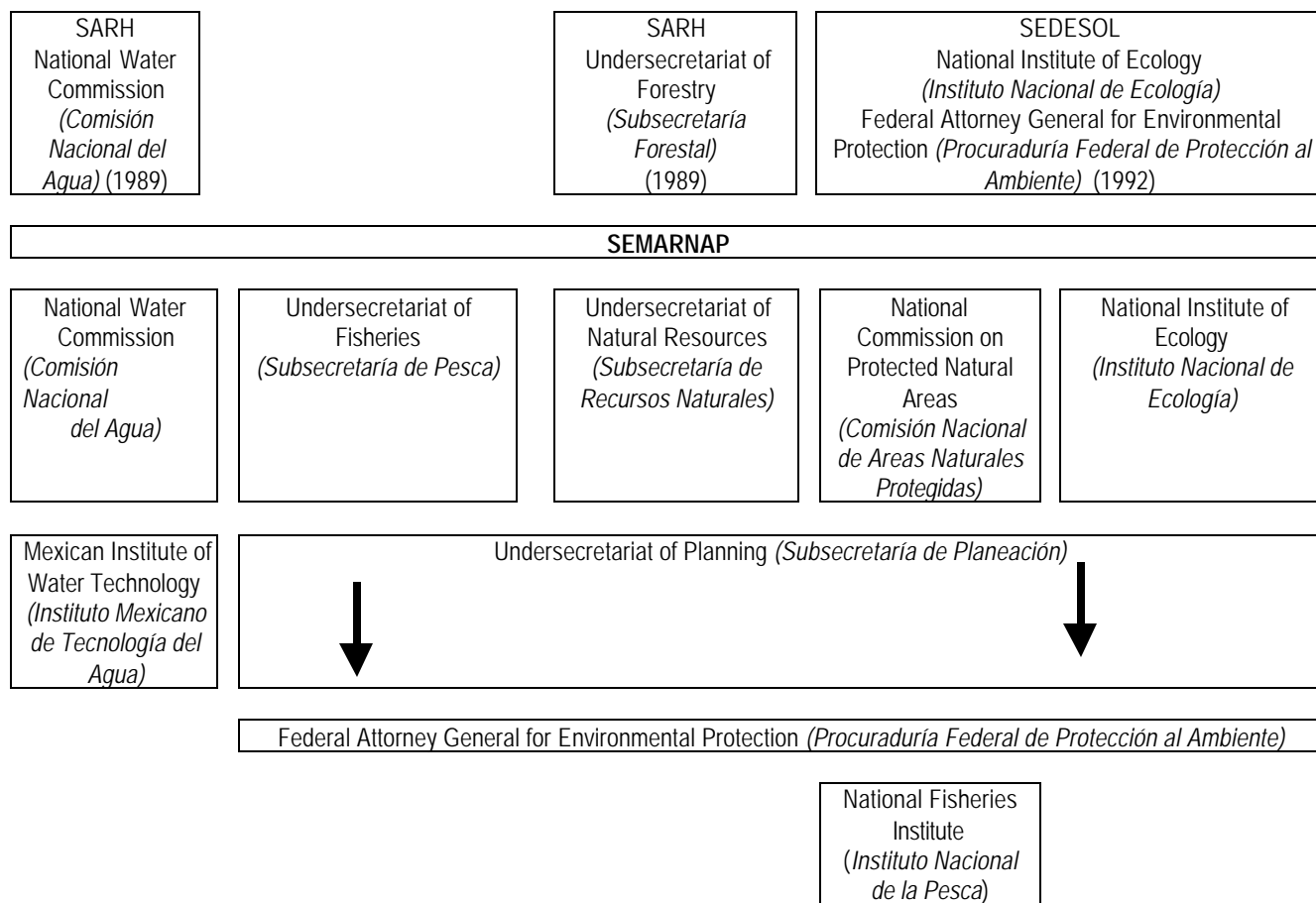
³⁹ Three regulations were promulgated under this law: Regulation for Prevention and Control of Atmospheric Pollution Generated by the Emission of Fumes and Dust (*Reglamento para la Prevención y Control de la Contaminación Atmosférica Originada por la Emisión de Humos y Polvos*); Regulation for Prevention and Control of Water Pollution (*Reglamento para la Prevención y Control de la Contaminación de las Aguas*); and Regulation for Prevention and Control of Ocean Pollution Caused by the Discharge of Wastes and Other Materials (*Reglamento para Prevenir y Controlar la Contaminación del Mar por Vertimiento de Desechos y Otras Materias*). González, J., and Montelongo, I., (1999), *Introducción al Derecho Ambiental Mexicano*, UAM, Mexico.

⁴⁰ Paragraph 6 of this Article states: "Under the criteria of social equity and productivity, businesses in the social and private sectors of the economy shall be supported and promoted, subjecting them to the modalities determined by the public interest, and to the use of productive resources for the overall good, while taking care of their conservation and the environment." *Idem*.

⁴¹ In which—at the level of an Undersecretariat—commitments, attention and budgets were shared with urban development, housing and property classified as patrimony. See G-25, "Sobre la Necesidad de un Nuevo Diseño Institucional en Materia de Política Ambiental," June 2000 (manuscript).

Figure 1. Evolution of Federal Environmental Management





Source: Semarnat (2000), *Gestión Ambiental en México*, Mexico.

4.1 Environmental Policy Instruments

As Mexico has improved its environmental management, new instruments have been developed and incorporated. They are applicable to the entire universe of participants and activities, and have the potential for generating much more efficient results. Therefore, while these policy instruments are being consolidated and developed further, new possibilities for their application are also being established. The instruments presented in the Environment Program 1995-2000 (*Programa de Medio Ambiente 1995-2000*) are the following:

- Protected Natural Areas (*Áreas Naturales Protegidas*)—ANPs
- Direct Wildlife Management (*Regulación Directa de Vida Silvestre*)
- Ecological Ordering of Territory (*Ordenamiento Ecológico del Territorio*)
- Environmental Impact Assessment (*Evaluación de impacto ambiental*)
- Risk Assessment (*Estudios de Riesgo*)
- Official Mexican Standards (*Normas Oficiales Mexicanas*)
- Direct Management of Hazardous Materials and Wastes and Risk (*Regulación Directa de Materiales y Residuos Peligrosos y Riesgo*)
- Direct Management of Industrial Activities (*Regulación Directa de Actividades Industriales*)
- Self-regulation (*Autorregulación*)
- Environmental Audit (*Auditoría Ambiental*)
- Economic Instruments (*Instrumentos Económicos*)
- Ecological Criteria (*Criterios Ecológicos*)
- Environmental Information (*Información Ambiental*)
- Education and Research (*Educación e Investigación*)
- Conventions, Agreements and Participation (*Convenios, Acuerdos y Participación*)
- Verification, Control and Monitoring (*Verificación, Control y Vigilancia*)

4.2 Semarnap's Priorities

The Secretariat of Environment, Natural Resources and Fisheries (*Secretaría de Medio Ambiente, Recursos Naturales y Pesca*—Semarnap) developed a strategy deploying three interconnected dimensions: the environmental, economic and social dimensions. These three dimensions are connected in integral regional programs implemented in marginalized areas. These programs have the potential to achieve and demonstrate the benefits of an integral focus on regional sustainable development, based on more rational use of available natural resources. Added to these three basic dimensions, there is a fourth that is of an instrumental nature and is expressed as a set of management strategies.

Table 1. Semarnap's Priorities

<ul style="list-style-type: none"> • Protected Natural Areas (<i>Áreas Naturales Protegidas</i>) • Air Quality (<i>Calidad del Aire</i>) • Defense of Forests (<i>Defensa de la Frontera Forestal</i>) • Inspection and Monitoring of Natural Resources (<i>Inspección y Vigilancia de Recursos Naturales</i>) • Ecological Ordering of Territory (<i>Ordenamiento Ecológico del Territorio</i>) • Ordering of Fisheries (<i>Ordenamiento Pesquero</i>) • Forest Development Program (<i>Programa de Desarrollo Forestal</i>—Prodefor) • Program of Commercial Forest Plantations (<i>Programa de Plantaciones Forestales Comerciales</i>—Prodeplan) • National Reforestation Program (<i>Programa Nacional de Reforestación</i>—Pronare) • Regional Development Program (<i>Programa de Desarrollo Regional</i>—Proders) 	<ul style="list-style-type: none"> • Hazardous Wastes (<i>Residuos Peligrosos</i>) • Wildlife (<i>Vida Silvestre</i>) • Critical Local Projects: <ul style="list-style-type: none"> - Nichupte Lacustrine System - Chacahua Lagoons - Patzcuaro Lake - Chapala Lake - Cortes Sea
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*The order in which priorities are listed does not indicate order of importance.
Source: COCODER VI, July 27, 1998.

4.3 Environment Budget and Expenses in Mexico

Public spending in the area of the environment is a key indicator for orienting and enhancing the market of goods and services related to environmental issues. It is also a real expression of the importance attributed to these issues in government management. Their relevance in official discourse has been increasing since the 1980s, and it is thus quite interesting to analyze the trends in federal government environment spending.

Table 2. Federal Budget Allocated to Semarnap 1995–2000
(in millions of current pesos)

Year	Total National Budget (1)	Programmable Expenses (2)	Budget for Government Offices (3)	Semarnap's Budget (4)	% of Semarnap's Budget within the National Budget (4)/(1)	% of Semarnap's Budget within Programmable Expenses (4)/(2)	% of Semarnap's Budget within Government Offices Budget (4)/(3)
1995	453,930.2	290,423.6	98,145.0	4,221.7	0.93%	1.45%	4.30%
1996	609,329.2	403,449.5	132,842.7	6,725.2	1.10%	1.67%	5.06%
1997	776,306.7	528,123.9	163,539.7	10,198.7	1.31%	1.93%	6.24%
1998	858,380.1	600,583.0	208,910.1	12,525.7	1.46%	2.09%	6.00%
1999	1,015,610.8	711,228.2	222,767.3	13,315.9	1.31%	1.87%	5.98%
2000	1,187,819.1	816,734.9	262,025.3	14,520.7	1.22%	1.78%	5.54%

Sources: Semarnap, *Programa de Trabajo* (several years), 1997-2000.

SHCP, National Expense Budget, 2000, Mexico.

Elaborated by authors with data from the Treasury Public Account (*Cuenta Pública de Hacienda*) 1995–1999.

The proportion of the total national budget allocated to the environment has increased from 0.93% in 1995 to 1.22% in 2000. Although the amount was increased by close to a percentage point, it has not been enough to solve the problems. As can be observed, the amount of national spending on environmental affairs is still disproportionately small, given the significance attributed to this area by the society and even in official discourse.

Nevertheless, the budget allocated to Semarnap does not reflect total national spending on environmental issues. Recent studies have calculated the federal government's Environmental Protection Expenditures (*Gastos en Protección Ambiental—GPA*),⁴² and we should note here that this spending includes not only the amount used by authorities in this area—in this case, Semarnap—but by all federal government programs, including publicly-owned companies.

The relationship between the federal government's GPA and the GDP provides a useful indicator, since it shows the percentage of the GDP allocated to environmental issues.

⁴² This is an indicator used by the members of OECD and the UN to measure efforts carried out by a country to protect/restore the environment. It consists of protection expenditures made to avoid, reduce or eliminate pollution, as well as any other environmental degradation, and it can be considered as a measurement of the economic costs faced by a society for protecting its environment. INEGI-INE, *Indicadores de Desarrollo Sustentable de México*, 2000.

Table 3. Environmental Protection Expenditures
(GPA) as a percentage of the GDP 1985–2000
(in millions of current pesos)

Year	GDP ¹	GPA ²	GPA/GDP
1985*	47,391	215	0.45%
1986	79,191	328	0.41%
1987	193,311	508	0.26%
1988	309,451	826	0.21%
1989	507,617	1,509	0.29%
1990	676,067	2,536	0.38%
1991	868,219.2	3,248	0.37%
1992	1,029,004.6	4,414	0.43%
1993	1,155,132.2	5,494	0.48%
1994	1,306,301.6	6,190	0.47%
1995	1,678,834.8	6,096	0.36%
1996	2,296,674.6	7,182	0.31%
1997	2,873,273	7,934	0.28%
1998	3,516,344.8	8,643	0.25%
1999**	4,622,788.8	9,218**	0.20%**
2000**	4,853,928.2**	10,745**	0.21%**

¹ GDP in basic values.

² Refers exclusively to actual expenditures of budget items, eliminating those programmed but not exercised, as well as those not directly impacting environmental protection.

* Data taken from period of 1985 to 1989 from INEGI-Semarnap, “Resultados Generales de los Estudios de Gasto en Protección Ambiental” (manuscript), Mexico, 1996.

** Estimate maintaining the actual GPA growth constant, and calculating a GDP growth rate of 5%. Banxico (2000).

Data: INEGI, *Sistema de Cuentas Económicas y Ecológicas de México 1988–1998*, Mexico, 2000.

Source: INEGI-Semarnap, *Indicadores de Desarrollo Sustentable*, Mexico, 2000.

Currently, the GPA is approximately 0.2% of the GDP, which is extremely low if compared to other OECD members that are more oriented toward sustainability, such as Nordic countries and some other European countries that spend approximately 0.9% and 1.0% of their GDP on environmental protection.

In addition to comparing the GPA with the GDP, it is worth comparing the GPA with total public spending. This comparison is useful for observing important trends in both total public spending and public environmental protection spending.

Table 4. Environmental Protection Expenditures and Total Expenditures 1985–1998

YEAR	CURRENT PRICES		AT 1993 PRICES**	
	Environmental Expenditures (GPA)	Total Expenditures (<i>Gasto Total</i> —GT)*	Environmental Expenditures (GPA)	Total Expenditures (<i>Gasto Total</i>) (GT)
1985	215	10,211.2	4,462.2	211,632.8
1986	328	13,133.8	4,023.3	161,152.0
1987	508	17,123.8	2,584.0	87,033.6
1988	826	33,788.1	2,087.2	85,377.4
1989	1,509	32,013.5	3,006.5	63,772.1
1990	2,536	42,495.5	3,945.5	66,115.3
1991	3,248	61,174.9	4,090.7	77,046.5
1992	4,414	71,188.2	4,839.9	78,057.3
1993	5,494	88,802.8	5,494.0	88,802.8
1994	6,190	98,574.7	5,707.7	90,894.1
1995	6,096	79,347.8	4,073.5	53,022.3
1996	7,182	146,605.0***	3,678.4	75,085.8
1997	7,934	197,029.2***	3,451.4	85,711.5
1998	8,643	233,592.6***	3,255.4	87,982.1

* Refers to expenditures by the public sector, including all government offices and entities with direct or indirect control, in compliance with environmental programs.

** Implicit deflator of GDP.

*** The GT calculated for these years is estimated, and includes the total expenditures of government offices and only companies with direct control, since information from those with indirect control was not available.

Source: For 1985–1994, the *Unidad Económica de Análisis Económico y Social* of Semarnap and the INEGI (1995), “Resultados Generales de los Estudios de Gasto en Protección Ambiental.” Elaborated with data from: INEGI, *Sistema de Cuentas Económicas y Ecológicas de México (SCEEM) 1985–1992*; INEGI, *Gasto en Protección Ambiental 1992–1995* (preliminary figures); SHCP, *Cuenta de Hacienda Pública Federal*.

Data from 1995–1998: INEGI, *Sistema de Cuentas Económicas y Ecológicas de México 1988–1998*, Mexico, 2000.

Elaborated by authors using 1994 prices, Banxico, 2000.

Source: INEGI-Semarnap, *Indicadores de Desarrollo Sustentable*, Mexico, 2000.

Beginning in 1994, GPA and GT amounts decreased significantly, however after the crisis, the GT began to recuperate lost ground and increased rapidly, even exceeding its own levels before the 1994 crisis. The GPA, for its part, remained the same during the period of 1995–1998, and even decreased slightly.

4.3.1 Distribution of Semarnap's Budget Among its Offices and its Allocation to Priorities

More than half of the federal budget allocated to Semarnap goes to the National Water Commission (CNA), while the rest is used in actions directed at ending the deterioration of the environment and natural resources, and promoting sustainable production, the fight against poverty, and management strategies. Resources designated for conservation are, therefore, very limited.

Lastly, the budget allocated to Semarnap's priorities in 1997 totaled P\$474.5 million, representing 4.65% of the total budget corresponding to the Secretariat. For that year, the amount was increased to P\$801.6 million, which at 5.61%, is a minimum proportion of the total budget allocated to the Secretariat for fulfilling its functions. The priority programs receiving the most resources in the 1996-2000 period are: the National Reforestation Program (*Programa Nacional de Reforestación—Pronare*), followed by the Program of Commercial Forestry Plantations (*Programa de Plantaciones Forestales Comerciales—Prodeplan*) and the Inspection and Monitoring of Natural Resources (*Inspección y Vigilancia de Recursos Naturales*).

4.4 Funding Requirements for the Various Areas of Environmental Problems

The federal government attributes very little importance to environmental issues; and there is an urgent need to reverse the trends toward environmental degradation discussed in the previous sections.

4.4.1 Costs of Environmental Deterioration

Environmental deterioration can already be expressed in economic terms, through estimates for the costs of natural resources depletion and environmental degradation. These estimated costs can then be incorporated, as either an adjustment or deduction, into national accounting data. In this way the Economic and Ecological Accounts System of Mexico (*Sistema de Cuentas Económicas y Ecológicas de México—SCEEM*) is created, for the purpose of arriving at the Ecological Net Domestic Product (*Producto Interno Neto Ecológico—PINE*),⁴³ to then measure the effects of the economic process on natural resources and the environment.

Between 1990 and 1998, the PINE was 12% lower than the Net Domestic Product (*Producto Interno Neto—PIN*). This means that, in 1998, the cost of environmental deterioration was more than P\$400 billion. This figure represents nearly 70% of all programmable expenditures of the federal government. With the contrast of the federal budget allocated to the environment, representing only a thousandth of the total, we can see the disproportionate relationship between the scale of environmental problems and the efforts undertaken to control them.

⁴³ INEGI has been applying environmental accounting criteria for linking natural resources and the environment with economic information. Ecological accounts are extended to the Traditional National Accounts System of Mexico (*Sistema Tradicional de Cuentas Nacionales de México*), by broadening the concept of assets to include not only produced assets, such as installations and equipment machinery, but also considering natural resources and the environment as assets. Based on the changes suffered by these assets each year, the costs of depletion and degradation of natural resources are taken into consideration (as in depreciation of machinery and equipment), and represent the necessary costs for avoiding such effects. These costs reduce the traditional GDP, while providing a new way to measure economic progress, the ecological GDP, with a sustainable development perspective. Jarque, C. (1999), *op. cit.*

Table 5. Net Domestic Product (PIN) and Environmental Costs, 1990–1998
(in current pesos)

Year	PIN	Environmental Costs	Percentage
1990	670,858	85,372	12.73%
1991	874,236	107,771	12.33%
1992	1,025.1	126,261.3	12.32%
1993	1,142.8	134,933.5	11.81%
1994	1,290.5	147,936.3	11.46%
1995	1,626.1	198,246.5	12.19%
1996	2,252.4	258,890.1	11.49%
1997	2,850.7	338,427.7	11.87%
1998	3,447.6	408,478.5	11.85%

Source: INEGI (2000), *Sistema de Cuentas Económicas y Ecológicas de México 1988–1998*, Mexico.

Environmental costs in the cattle ranching, forestry and fisheries sectors account for more than 23% of the PIN, while in the electricity, gas and water sectors, such costs account for 70%. In the manufacturing industry, environmental costs represent only 2% of the PIN.⁴⁴

This reveals the need for significant changes in sector-based policies, to allow institutions and instruments responsible for environmental policy to have an efficient influence on the entire sector-based structure of the economy.

It has been estimated that, at the end of the 20th Century, the magnitude of environmental impact reached an average of 11% of the GDP, meaning that the PINE was nearly 90% of the economic GDP. If the conditions observed during the last ten years are maintained, by the year 2030 there will be a significant difference between the changes in the GDP and in the PINE. That is, while the GDP (in current pesos) could be almost 14.6 times higher than in the year 2000, the depletion and degradation costs would be 37.4 times higher. Therefore, the PINE would account for 74.4% of the traditional GDP. In other words, the adjustment for environmental costs would be approximately 25.6% of the traditional GDP, and between the years 2000 and 2030, one GDP percent point in ecological deterioration would be added every two years.⁴⁵

4.4.2 Funding Requirements

It is evident that Semarnap's environmental budget is out of proportion with the dimension and significance of the country's environmental problems. It is therefore necessary that environmental management be attributed with the importance not given, so far, by the federal government, increasing the proportion of environmental protection expenditures within the GDP; using resources in an efficient and effective manner for national environmental priorities (greater effectiveness cost); re-allocating resources from current sector-based programs; and making efficient use of resources provided by international funding sources.

In order to assess the need for environment spending during the next ten years in Mexico, environmental protection expenditures (GPA)—an indicator more representative than Semarnap's budget—was projected. The objective is that, in the next ten years, the proportion of environmental protection expenditures (GPA) in relation to Mexico's GDP be increased from 0.25% in 2000, to 0.6% in 2010, and to 1.2% in 2025—to be comparable with the current proportions maintained by Mexico's primary trade partners and OECD members.

⁴⁴ CESPEDES (2000), *Desarrollo Sustentable: Reforma Institucional, Política Ambiental Eficaz*, Mexico.

⁴⁵ Jarque, C. (1999), *op. cit.*

Table 6. GPA/GDP of Various Countries, in the 1990s*

Country	Environmental Expenditures in the Public Sector	Environmental Expenditures in the Private Sector	Total
Canada	0.7%	0.5	1.2%
Mexico	0.25%	-	-
Australia	0.5%	0.5	0.8%
Spain	0.5%	0.3	0.8%
Japan	0.9%	0.6	1.6%
France	0.9%	0.5	1.4%
Poland	0.3%	0.8	1.1%
Germany	0.8%	0.6	1.4%
Belgium	0.4%	-	-
United States	0.7%	0.9	1.6%
Holland	1.2%	0.7	1.9%
United Kingdom	0.4%	0.6	1.0%

* may be from the mid-1990s or the last calculated value in the 1990s.

Source: OECD (1998), Towards Sustainable Development-Environmental Indicators, Paris.

Two projections were conducted: first, with the proportion of the GPA in the GDP remaining constant, showing that GPA growth in 10 years would be at least 1.2%; and second, with the proportion of the GPA in the GDP more than doubling, and the growth in environmental spending in 10 years at 5.1%. The latter would place us on the road to sustainability, with the expectation that, by 2025, the GPA/GDP proportion would be 1.2%.

Table 7. Projection* of Environmental Protection Expenditures (GPA) for 2000–2010 (in millions of current pesos)

Year	Projection 1**		Projection 2**	
	GPA	GDP	GPA	GPA/GDP
1998	8,643	3,516,344.8	8,643	0.25%
1999	11,557.0	4,622,788.8	13,174.9	0.29%
2000	12,134.8	4,853,928.2	15,532.6	0.32%
2001	12,741.6	5,096,624.6	18,093.0	0.36%
2002	13,378.6	5,351,455.9	20,870.7	0.39%
2003	14,047.6	5,619,028.7	23,880.9	0.43%
2004	14,750.0	5,899,980.1	27,139.9	0.46%
2005	15,487.4	6,194,979.1	30,665.1	0.50%
2006	16,261.8	6,504,728.1	34,475.1	0.53%
2007	17,074.9	6,829,964.5	38,58.3	0.57%
2008	17,928.7	7,171,462.7	43,028.8	0.60%
2009	18,825.1	7,530,035.8	47,815.7	0.64%
2010	19,766.3	7,906,537.6	52,973.8	0.67%

* Projections are based on a GDP growth rate of 5%, Banco de México.

** These projections were adjusted with a factor of 0.001%, with the intention that the proportion of environmental spending in the GDP for the year 2010 would be 0.5%; 1.0% for the year 2020, and 1.2% for the year 2025.

Source: Elaborated by the authors.

As previously mentioned, Semarnap's budget is insufficient for resolving environmental problems. However, efficient, effective use of these resources that focuses on national environmental priorities would increase their cost-effectiveness, and avoid the budget being spread so thin that any progress on environmental issues remains practically imperceptible.

Along these lines, two projections were carried out with regard to the budget being focused on the priorities defined by Semarnap. The first projection shows that by keeping the proportion of the Secretariat budget for priorities the same, in 10 years it would experience an approximate growth rate of 50%. In the second projection, however, we can observe a growth rate in the budget for priorities of more than 100% by the year 2010. The goal is that by the year 2025, national environmental priorities would receive 20% of the budget.

Table 8. Semarnap's Projected Budget for 2001–2010
(in millions of current pesos)

Year	Priorities*	Priorities**	% Of the Priorities' Budget/ Total Semarnap Budget
2000	801.60	801.6	5.5%
2001*	792.83	876.7	5.8%
2002*	832.47	1008.6	6.3%
2003*	874.10	1151.5	6.9%
2004*	917.80	1306.1	7.4%
2005*	963.69	1473.3	8.0%
2006*	1.011.88	1654.0	8.5%
2007*	1.062.47	1849.1	9.1%
2008*	1.115.60	2059.6	9.6%
2009*	1.171.37	2286.4	10.2%
2010*	1.229.94	2530.8	10.7%

* Considering a GDP growth rate of 5%.

** These projections were adjusted with a factor of 0.001%, with the intention that the proportion of environmental spending in the GDP would be 0.5% for the year 2010; 1% for the year 2020; and 1.2% for the year 2025.

Source: Elaborated by the authors.

As can be observed, the projected spending would not be enough to cover all the country's environmental deterioration costs in the next 10 years. It is therefore necessary to review the existing sector-based policies and programs, in which payment for environmental services could be included, such as in social and agricultural programs (Progresá and Procampo), for example.

Through this analysis, we can see where the federal government's resources for the environment will end up, as well as the areas requiring more capital flow, from either national or international sources, for environmental protection.

5. Funding of Environmental Projects in Mexico

Financing environmental projects is not attractive for traditional funding sources, because of their low financial profitability. Therefore, even when these projects are socially and environmentally desirable, they lack an adequate financial market that is willing to satisfy their needs.

To date, financial institutions in Mexico have not taken advantage of the opportunities to get involved in projects characterized by what is referred to as the "environmental agenda." The primary reason is that most environmental initiatives have a long-term maturation stage, and must compete for limited funds with others having shorter maturation terms. Also, most national financing institutions have preferred to concentrate their attention on investments and loans in traditional business fields, instead of taking the risk of exploring new frontiers—even though the latter have proven, at an international level, to be very profitable for both the companies and the funds supporting them.⁴⁶

In Mexico, the application of resources designated by the national development bank for environmental projects has not been very effective. There is consequently an opportunity for international funding sources and private

⁴⁶ López, C. (2000), *Financiamiento Alternativo para Proyectos Ambientales*, ITAM (thesis).

environmental funds to efficiently and effectively satisfy the demand of the government or companies for financing environmental projects. In this context, resources available for financing environmental projects in Mexico can be divided into four categories: multilateral, trilateral, bilateral and national.

5.1 Multilateral Funding Sources

Multilateral loan institutions are capitalized by a number of countries that lend money directly to sovereign governments. Such loans are supported by a repayment guarantee. The two multilateral funding institutions active in Mexico are the World Bank, and the Inter-American Development Bank (IDB).

5.1.1 World Bank

The World Bank has been investing in Mexico for more than 50 years, financing all types of projects. In 1998, World Bank's loans to public sectors were divided as follows: 25% to the health sector, receiving the highest percentage; followed by the agricultural sector, with 15%; social development, 13%; financial sector, 13%; and the environmental sector, at 12%.⁴⁷

The amount of funds allocated by the World Bank to environmental projects has varied from 1990 to 1997. The largest amounts were received in 1992 and 1994. In 1995, when the country was in a crisis, the World Bank did not make any loans to Mexico. Funding was reestablished in 1996, and then in 1997, the amount for environmental projects decreased.⁴⁸

In 1998, World Bank loans dedicated exclusively to the environmental sector are as follows: aquaculture, 2%; and forestry, 1%. It also provides other loans that are not exclusively environmental, but are related to this category: irrigation and sewage systems, 22%; modernization of water management, 11%; and potable water and sanitation in rural zones, 18%. These data reveal that the percentage allocated to purely environmental projects is minimal.

It is worth noting here that these loans are basically designated for building infrastructure and supporting productive activities, since the World Bank does not have a written environmental strategy.⁴⁹ It does have environmental priorities, however, including protection, environmental management, integration and sustainability.

5.1.2 Inter-American Development Bank

The Inter-American Development Bank (IDB) has been involved in Mexico since the 1960s. To date, this institution has granted 160 loans of different types, totaling more than US\$12.1 billion. In 1996, 40% of IDB funds were dedicated to social programs, sewage systems, urban development, housing, health, education and environmental programs.⁵⁰

In 1998, the IDB provided two loans in the area of the environment: the first for the Potable Water and Sewage System Program (*Programa de Agua Potable y Alcantarillado*) for US\$113.3 million; and the second for the Valle de México Sanitation Program (*Programa de Saneamiento del Valle de México*) for US\$400 million.

The IDB also has a current loan to Mexico for the project entitled "Ecological Recuperation of the Valle de México Metropolitan Area." It is being carried out jointly by the Metropolitan Environmental Commission (*Comisión*

⁴⁷ "Créditos Vigentes del Sector Medio Ambiente," a presentation by Fedro Guillén in the *diplomado* on Environmental Rights, UIA, 1999.

⁴⁸ World Bank's website.

⁴⁹ This is one of the criticisms made of the World Bank by B. Graizbord (2000) in the "Taller de Reflexión sobre la Asistencia y los Programas Ambientales del Banco Mundial en México y Otros Países de América Latina" (conclusions and proposals), LEAD-Mexico, Colmex. It was reiterated that the World Bank considers the environment as a secondary issue—that it has not incorporated into its concept of development. Also, it was insisted that the concept of development cannot be limited to growth with some social considerations taken into account, but rather must refer to sustainable development in the full meaning of the concept, with the environment playing a primary role.

⁵⁰ Inter-American Development Bank's website.

Ambiental Metropolitana—CAM), the Commission for Natural Resources of the Mexico City Government (*Comisión de Recursos Naturales del Gobierno del Distrito Federal*—Corena), and the Government of the State of Mexico (*Gobierno del Estado de México*). The project includes the construction of two environmental education centers, a "green roofs" project, and the recuperation of four ecological parks in Mexico City.⁵¹

The loan is for US\$200 million, and was designated in 1992. To date, the IDB has provided US\$140 million, which has already been used by the Mexico City government. The IDB has not been able to recover US\$100 million, and has therefore proposed to cover 50% of the second part of the loan, while the government would cover the other 50%. There is still US\$60 million to be provided in the two years remaining in the project. With the delay in this project, the IDB's credit portfolio for the environment is very limited.⁵²

5.1.3 United Nations Development Program (UNDP)

The United Nations Development Program (UNDP) provides assistance for promoting the creation and implementation of development programs aimed at eliminating poverty; creating jobs and sustainable means of earning a living; enhancing the participation of women in society; and protecting and regenerating the environment.⁵³

With respect to the environment, the UNDP has a Program for Supporting Environmental Development Policy, which develops environmental projects and attracts funds from international agencies. The UNDP is assisting the Mexican government in designing and executing its environmental program, channeling international resources such as those offered by the Global Environment Facility (GEF), or the Montreal Protocol.

5.1.4 Global Environment Facility (GEF)

The Global Environment Facility (GEF) was established in 1992 as a funding source that provides donations and grants funds under concessionary-type conditions to countries for the purpose of carrying out projects and activities designed to protect the world's environment. It is a multilateral fund consisting of contributions from 34 countries, and currently has 166 member countries, including both donating and receiving countries.

GEF operations are carried out through three entities: the United Nations Development Program (UNDP), the World Bank (WB), and the United Nations Environment Program (UNEP), which are known as implementing agencies.

During the GEF's First Phase (1992–1997), Mexico promised to contribute the equivalent of US\$5.6 million in Draft Special Rights (*Derechos Especiales de Giro*—DEG). This full amount has been paid by the Mexican government. Mexico is the only receiving and contributing Latin American country that has fulfilled its commitments on time, unlike other countries such as Brazil and Argentina.⁵⁴

For the Fund's Second Replenishment (1998–2002), Mexico agreed to make a contribution of US\$5.5 million, to be fully paid in 2001 with a planned contribution of US\$2.75 million. In this way, Mexico has achieved an extraordinary cost-benefit situation, receiving approximately US\$133 million in exchange for contributing US\$11.10 million to the GEF.⁵⁵ The funding received has been invested in projects related to climatic change, biodiversity, high energy efficiency, and protected natural areas.

⁵¹ Parks to be developed include one for handicapped persons in the Iztapalapa city district. Work to recover lands currently used as illegal garbage and debris dump sites will begin there in August, and the park will have 4,500 m² of green areas. The "green roofs" program will be developed in elementary, secondary and high schools. Sosa, I. (2000), "Financia el BID Proyecto Verde" in the Reforma newspaper, city section, Friday, July 28.

⁵² Interview with Rafael Negrete, Director of Environment for the Inter-American Development Bank.

⁵³ UNDP website.

⁵⁴ Semarnap, GEF Unit, 2000.

⁵⁵ *Idem*.

5.1.5 World Wildlife Fund (WWF)

The World Wildlife Fund (WWF) has invested over US\$1.1 billion in 11,000 projects in 130 countries. Funds in the amount of approximately US \$400 million are raised worldwide each year through contributions by individuals.⁵⁶

In 1990, WWF opened a regional office in Oaxaca, and in 1993, another in Mexico City. In Mexico, the WWF has made small donations to leaders in conservation, as well as to NGOs and to research projects on the status of certain species. Currently, its assistance is concentrated on providing technical and financial resources for some regions having specific ecosystems, and to ecoregions.

In 1993, WWF created the Mexican Fund for the Conservation of Nature (*Fondo Mexicano para la Conservación de la Naturaleza*—FMCN), with a contribution of US\$30 million. Today, it is the largest fund of this type in Latin America.

WWF's Mexico Program is financed by a number of sources, including WWF members from Canada, the United States and the United Kingdom; foundations such as the MacArthur, Packard, and Rufford, and the European Lotteries; and governmental sources such as the European Union, DFID-UK, and USAID. About 70% of these resources are used to support the work of conservationist organizations in Mexico.

5.1.6 Conservation International (CI)

Conservation International (CI) operates in 23 countries in Latin America, Africa and the Pacific Asian region. The program is focused on the so-called "hot spots," referring to areas characterized by a high level of biodiversity. Mexico is one of the countries having this type of area, and therefore, since 1987, CI has been committed to assisting Mexico in maintaining and preserving its ecosystems and the environment.

In Mexico, CI's effort are focused on priority ecosystems, such as the Gulf of California, the Lacandon Forest, and "El Triunfo" Biosphere Reserve, as well as on the production of shade coffee.⁵⁷

5.1.7 The Nature Conservancy (TNC)

In Mexico, The Nature Conservancy (TNC) seeks to provide assistance to areas that have a significant variety of ecosystems but are not included in the system of protected natural areas. TNC's program in Mexico is focused on support to protected areas, and the protection of marine and land species. The projects supported are in the areas of:

- Environmental education
- Health
- Sustainable development
- Ecotourism
- Management of national parks

5.1.8 MacArthur Foundation

The John D. and Catherine T. MacArthur Foundation was created in 1978. The foundation made the following contributions to Mexico in 1998 and 1999 through its Global Sustainability Program: US\$250,000 in 1998; and US\$735,000 in 1999.⁵⁸ The funds have been invested in forestry projects, sustainable development, and natural resources management.

⁵⁶ Interview with Guillermo Castillejos, Director of the WWF Office in Mexico.

⁵⁷ Information from Conservation International's website.

⁵⁸ Information from the MacArthur Foundation.

5.1.9 Ford Foundation

The Ford Foundation was created in 1936, and since 1950 it has operated as a philanthropic institution in Michigan, United States. The assistance this foundation provides to Mexico is concentrated in three geographical regions: the poorest areas characterized by large indigenous populations in the country's southern states; Central Mexico, including Mexico City; and the Mexico-US border.

Ford Foundation contributions to Mexico in 1999 and for 2000 come to a total of US\$777,000 that has been designated for conservation and forestry projects.⁵⁹

5.1.10 Packard Foundation

The Packard Foundation provides donations to the following areas: conservation, population, science, communities, arts, and philanthropy. This foundation's primary interest within the area of the environment is on the preservation of marine and coastal ecosystems located in critical ecoregions. In Mexico, therefore, it is supporting activities related to public policy, economic analysis and education, with an emphasis on the Gulf of California. This year, the foundation will provide Mexico with US\$428,988, of which US\$179,000 will be foundation capital, and the rest, US\$249,988, will be international capital.⁶⁰

5.1.11 Rockefeller Foundation

In Mexico, the Rockefeller Foundation supports environmental efforts through El Colegio de México, with the Leadership for Environment and Development (LEAD) program.

5.2 Trilateral Funding Sources

Trilateral loaning institutions are capitalized by three governments, in this case, of the United States, Canada and Mexico, which, after enacting the North American Free Trade Agreement (NAFTA), created the CEC, which is responsible for managing the North American Fund for Environmental Cooperation (NAFEC). This is the only funding source for trilateral environmental projects in the region.

5.2.1 North American Fund for Environmental Cooperation (NAFEC)

In 1995, the CEC created the North American Fund for Environmental Cooperation (NAFEC) for the purpose of financing community projects promoting CEC goals and objectives in Mexico, Canada and the United States.

To fulfill these objectives, NAFEC focuses on four main areas:

- Conservation of Biodiversity - to promote and preserve ecosystems; to protect and use natural resources in a sustainable way; including an emphasis on genetic diversity, species and habitats.
- Pollutants and Health - to reduce pollution risks and minimize their impacts, including an emphasis on environmental technology, reduction of environmental risks, and pollution prevention.
- Environmental Legislation and Policies - to achieve compliance with legislation, including effective enforcement of environmental laws and regulations.
- Environment, Economy and Trade - to promote compatibility among environmental, trade and economic policies.

Since 1996, the NAFEC has provided 142 grants, totaling US\$5.4 million, to community initiatives dedicated to preserving, protecting and improving the North American environment.

⁵⁹ Information provided by the Ford Foundation.

⁶⁰ Information from the Foundation's website.

5.3 Bilateral Funding Sources

Bilateral loaning institutions are capitalized by two governments, in this case, Mexico and the United States. The three bilateral institutions financing environmental projects in Mexico are: the Border Environment Cooperation Commission (BECC), North American Development Bank (NADB), and Agency for International Development (USAID).

5.3.1 Border Environment Cooperation Commission (BECC)

The border zone between Mexico and the United States is characterized by serious environmental problems in a number of different areas, therefore ecological infrastructure is needed, particularly in the areas of water pollution, wastewater treatment, and solid municipal waste, as well as others.

Certified projects are eligible for funding from the NADB or other sources. By the year 2000, the Border Environment Cooperation Commission (BECC) had authorized funds totaling more than US\$17 million for nearly 100 communities, to help finance 125 projects. For the year 2000, approximately US\$7,000 have been invested in certified projects on potable water, sanitation and solid wastes.⁶¹

5.3.2 North American Development Bank (NADB)

The North American Development Bank's main role is to facilitate funding for projects certified by BECC, and to provide consultation services on financial and managerial issues, for the purpose of assisting interested communities with planning and integral development of long-term infrastructure.

About 90% of NADB capital is dedicated to support BECC-certified infrastructure projects, while the remaining 10% is available for supporting community issues and investment programs. NADB gives priority to projects related to wastewater treatment, potable water and municipal solid wastes. Eligible candidates are public agencies, private companies, and private and public associations. The amount of funds granted by NADB from 1997 to 2000 came to a total of US\$134 million.⁶²

5.3.3 US Agency for International Development (USAID)

The US Agency for International Development (USAID) is a US governmental agency that provides support to developing countries and to countries with medium-level incomes, like Mexico.

In 1997, the overall USAID/Mexico program received US\$17.4 million, of which US\$4.9 million were specifically designated for environmentally related activities. In 1998, US\$5.4 million of the total were designated, and in 2000, US\$6 million.⁶³

⁶¹ NADB (2000), *Optimización de la Capacidad de Financiamiento del BDAN*, Mexico, June.

⁶² *Idem*.

⁶³ Elaborated by authors with information from Presentations to Congress by the US Agency for International Development (several years).

5.4 National Funding Sources

Development banks, geared toward both semi-official companies and the private sector, have been the main federal funding source for environmental projects.⁶⁴ Most federal funds designated for environmental infrastructure projects are channeled through the National Bank for Public Works and Services (*Banco Nacional de Obras y Servicios Públicos*—Banobras), and National Financing (*Nacional Financiera*—Nafin).

In addition, there are three types of national institutions that finance conservation projects in Mexico: private institutions, nongovernmental organizations (NGOs), and federal government institutions. Examples are: Mexican Fund for the Conservation of Nature (*Fondo Mexicano para la Conservación de la Naturaleza*—FMCN), Pronatura, the National Commission for Knowledge and Use of Biodiversity (*Comisión Nacional para el Conocimiento y Uso de la Biodiversidad*—CONABIO), and the Metropolitan Environmental Commission (*Comisión Ambiental Metropolitana*).

5.4.1 National Bank for Public Works and Services (*Banco Nacional de Obras y Servicios Públicos*) (Banobras)

Created in 1933, the National Bank for Public Works and Services (*Banco Nacional de Obras y Servicios Públicos*—Banobras) is the main development bank in Mexico for financing infrastructure, services and public housing projects. Currently, Banobras also finances and manages funds for environmental infrastructure projects.

One of the funds provided by Banobras as a financing agent was for the Mexican Environmental Program (*Programa Ambiental Mexicano*—PAM), 1992–1997.⁶⁵ However, in the case of this donation, the following problem resulted: Since the resources were introduced for use in public spending programming, the Secretariat of the Treasury authorized their application under the programming structure for the federal expenditure budget. Since these funds were then subject to fiscal regulations, they could not be exercised in a continuous manner, thus the conservation and sustainable development projects in protected natural areas—that require a constant flow of resources—could not be carried out satisfactorily. This limitation posed by strict annual compliance of fiscal regulations made it impossible to use the funds with the agility required, and resulted in ongoing under-use of the funds, thus limiting the fulfillment of the established goals.⁶⁶

5.4.1.1 Fund for Investment in Infrastructure (*Fondo de Inversión en Infraestructura*—Finfra)

The Fund for Investment in Infrastructure (*Fondo de Inversión en Infraestructura*—Finfra) is operated by Banobras and is designed to promote the participation of the private sector in basic infrastructure projects that are highly beneficial for the society.

Currently, the Finfra Technical Committee has authorized 11 projects in the water, sewage and sanitation sectors, with a total investment of more than P\$2.5 billion.⁶⁷

⁶⁴ Mexican government funds are used to finance a number of federal institutions involved in the development of environmental laws, regulations and audits. In addition, funding is also provided for environmental projects through incentives, direct donations, and direct and indirect subsidies. However, in Mexico, incentives for investing in environmental projects are quite limited. They include accelerated depreciation of environmental equipment, and tariff reductions. Direct donations, for their part, are being significantly reduced; for example, the Mexican government is reducing subsidy programs to municipal governments, in order to promote a market-driven economy. Finally, direct and indirect subsidies may be available for projects addressing local and state markets. The Mexican government is still granting an indirect subsidy to the operation of municipal infrastructure systems.

⁶⁵ The objective of the program was to maintain the government's capacity, in the short-term, for accomplishing the functions of regulating and protecting the environment and national resources, as well as reinforcing the institutional policy framework, thus ensuring that these functions would be carried out in an efficient, decentralized manner in the future.

⁶⁶ *Idem.*

⁶⁷ Caso, R. (2000).

5.4.2 Nacional Financiera (Nafin)

Nacional Financiera (Nafin) is the development bank for Mexico's private sector. Since 1989, it has been focused on small and medium-size industries.

NAFIN offers a wide array of products and services to support pollution prevention projects, from second floor credit operations to (temporary, small) risk capital contributions, and including a guarantee program to help Mexican entrepreneurs have access to loans, as well as a *quasi-capital* scheme, aimed at channeling resources to companies without incurring financial costs.

In 1992, the Japanese Exports and Imports Bank (Eximbank) opened a line of credit to Mexico consisting of US\$200 million for financing the Program for the Control of the Air Pollution from Fixed Sources in the Valle de México Metropolitan Area (*Programa para el Control de la Contaminación del Aire Proveniente de Fuentes Fijas en la Zona Metropolitana del Valle de México*). The major limitation in this line of credit was that it could only be applied to air pollution control projects in the Valle of México Metropolitan Area, leaving a large number of environmental projects in the rest of the country ineligible for this assistance. To date, approximately US\$60 million have been used by the Vidrio Plano company.⁶⁸

Due to changes at Eximbank, this line of credit was renegotiated with the Japanese International Cooperation Bank, and now it is less restrictive than before, allowing for use in financing projects that fulfill the conditions specified in the Environmental Program 1995-2000. The amount of the credit line is US\$200 million, divided in 20 loans of US\$10 million each. The deadline for funds to be granted is July 31, 2001.⁶⁹

5.4.3 Mexican Fund for the Conservation of Nature (*Fondo Mexicano para la Conservación de la Naturaleza—FMCN*)

The Mexican Fund for the Conservation of Nature (*Fondo Mexicano para la Conservación de la Naturaleza—FMCN*), was created in 1994 as a private civil association under Mexican legislation. Its mission is to conserve biological diversity in Mexico and achieve sustainable use of natural resources, by promoting strategic measures and providing medium and long-term financial support.⁷⁰

In 1997, FMCN received a donation of US\$16.5 million from the Global Environment Facility (GEF) that was facilitated by the World Bank for the purpose of establishing a Fund for Protected Natural Areas (*Fondo para Áreas Naturales Protegidas—FANP*). Since January 1998, income from the fund (approximately US\$1 million a year) has been used to cover the management expenses for 10 protected natural areas. Contributions from this fund—however small—have provided park administrators with the certainty of available resources, that is, a guarantee for covering basic operational expenses and staff salaries. This makes it possible, in turn, to retain staff and concentrate efforts on conservation activities, attracting funding sources for projects, and collaborating with interested communities and organizations.

As a result of the calls for project submissions from 1996-99, 285 projects have been approved, receiving a total of P\$71.1 million.

⁶⁸ Canacindra-GTZ (1999), *Fuentes de Financiamiento de Proyectos Ambientales en México y para la Competitividad Industrial* (manuscript).

⁶⁹ There is not a great deal of demand for these funds, however, in part because information regarding their availability has not been widely disseminated, and also because of bureaucratic obstacles. Interview with the General Director of Environmental Projects at Nafin.

⁷⁰ The fund was capitalized in 1993, with commitments made by the Mexican government in the amount of US\$10 million, and from the US government in the amount of US\$20 million. Meetings were held with other governments, both European and Asian, to seek additional contributions.

Table 9. Projects Supported, 1996–1999

Year	Projects Supported	Amount offered (in Mexican pesos)
1996	76	\$15,086,000
1997	108	\$16,879,131
1998	51	\$16,676,968
1999	45	\$25,165,528

Source: FMCN, Annual Report (several years), 1996–1999

5.4.4 Pronatura

Pronatura is a Mexican nonprofit, civil organization founded in 1981, with the mission of preserving Mexico's biodiversity. In order to accomplish this mission, Pronatura operates on a regional level in the Baja California peninsula, the Mexican Northeast, Sonora, Veracruz, Chiapas, and the Yucatan peninsula.

5.4.5 National Commission for Knowledge and Use of Biodiversity (*Comisión Nacional para el Conocimiento y Uso de la Biodiversidad—Conabio*)

Conabio was created in 1992 by presidential decree in order to fulfill the commitments made in the Convention on Biological Diversity signed in Rio. Its purpose is to promote, support, and coordinate efforts currently made by a number of institutions and groups working in the area of biodiversity in Mexico. Most Conabio resources have been channeled to projects carried out by already-existing research institutions and working groups. Priorities for the use of these resources were defined in consultation with experts and national institutions. Projects supported by Conabio are in the following areas: aquatic ecosystems; botany; the conservation, restoration, use and management of biodiversity; dissemination of ecological and genetic information; fungus; and zoology.

6. Priorities for International Cooperation

As observed throughout this study, the Secretariat's priorities, and those of international entities, are not always compatible. There are high priority national issues for which international agencies and entities do not provide any resources.

After analyzing the priorities of Semarnap, the CEC, and the various national and international funding sources for environmental projects, it has been concluded that environmental priorities can be ranked as follows (in order): management of protected natural areas; compliance with environmental legislation; air quality, reinforcement of institutional capabilities, sustainable water management, hazardous wastes management, and sustainable management of forest resources.

With this information, the CEC will be able to effectively direct its funding flows to the environmental cooperation programs with Mexico, to achieve the desired objectives.

7. Conclusions

Mexico is fortunate to possess a great amount of resources that make up part of its "natural" capital. However, the last 50 years of economic growth have been accompanied by the systematic destruction of natural resources and the increasing deterioration of environmental quality, impacting the population's health and quality of life, as well as the natural resources that are strategic for the country's development.

The prevailing environmental and social situation in Mexico makes it necessary to promote sustainable development that includes the modification of production and consumption models. Economic growth signifies more resources that could be oriented toward the conservation of biodiversity, investment in infrastructure for ecological protection, technological changes and cleaner production processes. It also implies higher income levels which should lead to more importance attributed to environmental concerns, as demonstrated in the experiences of developed countries.

Sustainable development includes preserving the nation's ecological capital, as well as the public property and strategic environmental services that it supplies: climatic stability, biodiversity, natural resources, water availability, air quality, hydrological balance and, in general, the factors that are key to the well-being of citizens, communities and regions. To achieve this, as discussed throughout this document, it is necessary to reformulate environmental policy in order to promote Mexico's development on the path to sustainability—within the context of a dynamic economy that increases income levels, accelerates the demographic transition, improves the population's quality of life, and reduces poverty levels.

The increasing disparity, marginalization and poverty contrasting the rural and urban populations across the country have a direct effect on the sound, efficient use of natural resources, and the vulnerability levels of large sectors of the population. Bringing an end to the negative circle of poverty, environmental degradation and economic inefficiency should be a key aspect in the fight against poverty and the efforts to overcome the conditions that generate and reproduce poverty.

In addition, it must also be pointed out that some government programs and sector-based policies have led to environmental degradation, and have become far removed from the objective of promoting economic growth that takes into account the need for protecting the ecosystem and natural resources. One example can be seen in agricultural and ranching policies that have led to processes that cause deforestation and ill-advised land use changes. These policies have also promoted a bias against sustainable forestry practices, and encouraged the expansion of agricultural lands to include land that does not even lend itself to agricultural objectives.

Another example lies in hydraulic policies based on several types of subsidies for water consumption and electricity, mostly for the agricultural sector. These policies have been the cause of the increasing over-exploitation of aquifers, and have contributed to a serious situation of chronic water scarcity in a number of Mexican states.

It is estimated that the costs of environmental deterioration in Mexico are between 11% and 14% of the GDP.⁷¹ The annual economic losses of such degradation are currently at the following levels: more than US\$1.1 billion caused by the depletion of groundwater layers; US\$1.2 billion caused by soil erosion; more than US\$3.6 billion in health damages caused by water pollution and pollution generated by solid wastes; and more than US\$1 million in health damages caused by pollution in Mexico City.⁷²

If decisive actions are not taken to reverse this situation, the country's environmental debt will continue to grow. In addition to representing increased public and private expenditures, this will also have a continuous negative impact on the well-being of the society, and will cancel opportunities for the growth of significant productive sectors.

In this context, the State must carefully review its policies and programs; implement a strategy that acknowledges the fact that environmental problems exist across sectors; and correct market failures that have worked against equity, the environment and the population's quality of life.

Because of the minimal importance attributed by the State to the major environmental issues, resources allocated for environmental spending in these areas are insufficient to resolve the high-priority problems throughout national territory. Most of environmental spending is dedicated to areas which are not precisely environmental areas, such as the water program that absorbs more than half of Semarnap's total budget, while other priorities defined by this institution receive only about 5%.

It is therefore urgent that the State recognize the importance of the environment for the country's development, and allocate more resources for resolving problems in this area. It is also necessary to promote creative financial solutions, taking advantage of assistance provided by international funding sources, and to motivate national funding sources to provide resources for environmental projects.

⁷¹ World Bank studies.

⁷² Lichtinger, V., Ojeda, O. (2000).

Another way the State could resolve the financing problem would be through integral fiscal reform. Using the experience from developed countries, it should be advocated that the same volume of revenue be collected by the State, but that some taxes on income, savings, employment, and investment be replaced with ecological taxes. It would be possible in this way to modify the framework of incentives to orient decisions made by economic agents in favor of sustainable development, while penalizing behaviors with a negative social connotation, and lightening the burden accompanying socially desirable processes, such as recuperating the environment, increasing productivity, generating jobs, and creating capital. And thus, sustainable development would go hand-in-hand with greater overall efficiency in our economy.

Another alternative is to take advantage of the considerable international offers of assistance in financing environmental projects focused on infrastructure, conservation, technical assistance and technology, as well as capacity building. As can be observed throughout the study, this option is proposed by a number of institutions interested in assisting Mexico through loans and donations.

Many of these institutions have been in Mexico for more than 20 years, and therefore have extensive experience in the area of international assistance. In particular, there is a strong link between multilateral financing institutions such as the World Bank and the Inter-American Development Bank, which have financed many types of projects in Mexico. In the area of the environment, their funding has been oriented toward potable water and sanitation infrastructure, and efforts to diminish poverty.

Loans of this type are negotiated directly by the government. They have some disadvantages, such as a slow authorization procedure, and sometimes, the resources provided are subject to fiscal regulations. Consequently, they are incorporated into the government office's budget, and thus not considered as additional resources, but rather substitutes for budget monies.

There are also international foundations and NGOs that offer donations and loans, mostly for biodiversity conservation. Such resources may be granted through the previously mentioned multilateral banks, channeled to national NGOs, or directly applied to already-existing environmental programs. What Mexico needs to do is facilitate access to these funding opportunities, by making information about them known and by eliminating all bureaucratic obstacles.

Funding of environmental projects by national banks has not been very successful, mostly due to a lack of interest from traditional funding sources in providing resources to projects considered to have a low financial profit potential, high risk level, and long-term maturation.

In addition, international credit lines obtained by Mexico's development banks to be applied to environmental projects (potable water, sanitation, waste management, and technical assistance to industries) have not been adequately promoted. These resources typically do not reach the group originally targeted, which is not aware they exist; or there are so many bureaucratic obstacles to accessing them, that groups potentially interested are discouraged from applying. These credit lines are therefore withdrawn because no one is using them.

It should also be noted here that these credit lines are negotiated without taking environmental priorities into consideration. Consequently, they are limited to only certain areas in which the benefits obtained are only marginal, and they are not available for the areas where they are needed the most. Finally, loans granted by national development banks are not attractive, given the low profit margin, high interest rates, and required guarantees, the latter of which are sometimes out of proportion. As a result, the demand for environmental loans is very low, despite the urgent needs that exist.

In order to make financing provided by national banks function, it is necessary to develop a certain synergy between the financial sector and the various productive sectors—that will work in favor of sustainable development. Banks are not very interested in financing this segment of clients with this type of loans, given their high risk. It is therefore very important to reach the needed agreements, and to promote systems for assessing risks and evaluating companies' environmental performance. This requires the standardization of environmental reports to be submitted by companies, and also adequate mechanisms for analyzing and qualifying the information reported. It needs to be demonstrated in Mexico, as well as in Europe and the United States, that companies with better environmental performance yield financial results that are systematically more attractive. This will at the same time demonstrate in

an objective manner that environmental protection and competition are compatible and mutually reinforcing—based, of course, on a philosophy of eco-efficiency.

The development and consolidation of a significant part of that market depends on the existence of a new public tradition with regard to the responsibility of individuals in financing environmental solutions. This is indispensable for ensuring a payment flow that is sufficient, stable and predictable, thus allowing financial institutions to support projects that have social and environmental benefits, and are also financially profitable.

It is also important to define or have a very clear conception of the priority areas where these resources could have a greater effect or added value for helping to resolve environmental problems. After analyzing the priorities established by Semarnap, the CEC and international funding sources, it has been concluded that priority areas within environmental management are the following:

- Management of protected natural areas
- Compliance with environmental legislation
- Air quality
- Reinforcement of institutional capabilities
- Sustainable water management
- Hazardous wastes management
- Sustainable management of forest resources

In this context, given the limited resources for environmental matters, and the difficulty in obtaining them, it is necessary to first of all, make efficient and effective use of existing budgetary resources for the above mentioned priorities, with the aim of increasing their cost-effectiveness. Second, it is necessary to seek mechanisms for using resources from rural and poverty programs (Procampo and Progresa) to meet environmental objectives. Here, it is necessary to orient policies from a "main stream" context, based on regional studies within adequate political substantiation.

In this way, resources provided by the CEC, however limited, may be transformed into concrete actions in the priorities areas within Mexico's environmental management.