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SUSTAINABLE DEVELOPMENT DEPARTMENT

ENVIRONMENT DIVISION (SDS/ENV)

**ENVIRONMENTAL EVALUATION OF THE PRIVATIZATION
OF PUBLIC SERVICES IN THE LATIN AMERICAN REGION**

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CONTENTS

List of Acronyms and abbreviations	004
Acknowledgments	009
1. Executive Summary.	010
2. Introduction and Objectives.	015
3. Privatization and Environment Concerns in the Region.	019
3.1. The privatization of public services.	
3.2. Pre-privatization and environmental conditions.	
3.3. Privatization's major environmental concerns in the Region.	
4. Environmental Evaluation of the Privatization of Public Services in the Region.	026
4.1. Argentina.	
4.2. Bolivia.	
4.3. Chile.	
4.4. Mexico.	
4.5. Panama.	
4.6. Peru.	
5. The Environment and the Privatization of Public Services Issues Discussion.	047
5.1. Environmental problems with or without the privatization of public services.	
5.2. Legislation	
5.3. Institutional arrangements.	
5.4. Policy and political will.	
5.5. Regulation.	
5.6. Standards.	
5.7. Monitoring, auditing and enforcement.	
5.8. Environmental liabilities.	
5.9. Environmental impact studies.	
5.10. Public awareness, involvement and participation.	
5.11. Financing, investment and incentives for environmental enhancement.	
5.12. Privatization contracts.	
6. Conclusions and Recommendations.	055
6.1. Environmental issues directly related to the privatization of public enterprises.	
6.1.1. Environmental liabilities.	
6.1.2. Pollution flows, regulatory freezes and unsustainable use of resources.	
6.2. Broader environmental issues and the privatization of public enterprises.	
6.3. General environmental guidelines for the privatization of public services.	

- 6.3.1. General guidelines during project preparation.
- 6.3.2. General guidelines during project implementation and (post) completion.
- 6.4. Some general environment-related recommendations to multinational finance institutions in the privatization of public services in the Region.
- 6.5. Has privatization improved the environmental quality in the Region?

7. References.

063

8. Annexes.

Annex A. Environmental Issues and Privatization of Public Services Field data.

Annex B. Key People Interviewed and Contacts.

LIST OF ACRONYMS AND ABBREVIATIONS

1. GENERAL.

BLT:	Build, lease and transfer.
BOL:	Build, own and lease.
BOO:	Built, operate and own.
BOT:	Built, operate and transfer.
BOOT:	Built, operate, own and transfer.
EIA:	Environmental Impact Assessment (<i>Estudio de Impacto Ambiental</i>).
FOMIN:	IDB's Multilateral Investment Fund (<i>Fondo Multilateral de Inversiones</i>).
GW	gigawatt
IDB:	Inter-American Development Bank (<i>Banco Inter-Americano de Desarrollo</i>).
IPP:	Independent power producer (Productor independiente de energía)
mgd:	million gallons per day.
m ³ /s:	cubic meters per second (1 m ³ /s = 25 mgd).
MW:	megawatt.
OM&M:	Operation, maintenance and management contract (<i>contrato de operación, mantenimiento y gestión</i>).
PAMA:	Environmental Mitigation Plan (<i>Programa de Adecuación Ambiental</i>).
PEE:	External energy supplier.
WB:	World Bank (<i>Banco Mundial</i>).

2. ARGENTINA.

APN:	National Ports Authority (<i>Autoridad Portuaria Nacional</i>).
CAMMESA:	Wholesale Electric Market Management Corporation (<i>Compañía Administradora del Mercado Mayorista Eléctrico Sociedad Anónima</i>).
DNV:	National Road Directorate (<i>Dirección Nacional de Vialidad</i>).

EPAS: Water and Sanitation Regulatory Agency for the Province of Mendoza (*Ente Provincial de Agua y Saneamiento*).

ETOSS: Infrastructure and Sanitary Services Regulatory Agency (*Ente Tripartito de Obras y Servicios Sanitarios*).

ENRE: National Electric Regulatory Institution (*Ente Nacional Regulador de Electricidad*).

OSN: Sanitary Infrastructure of the Nation (*Obras Sanitarias de la Nación*).

3. **BOLIVIA**.

FNDR: National Fund for Regional Development (*Fondo Nacional de Desarrollo Regional*).

FONAMA: National Environmental Fund (*Fondo Nacional de Medio Ambiente*).

MDSP: Ministry of Sustainable Development and Planning (Ministerio de Desarrollo Sostenible y Planificación).

SIRESE: National Regulatory System (*Sistema de Regulación Sectorial*).

YPFB: *Yacimientos Petroleros Fiscales de Bolivia*. Government-owned oil conglomerate.

4. **CHILE**.

CDE: Energy Commission (*Comisión de Energía*).

CONAMA: National Environmental Commission (*Comisión Nacional del Medio Ambiente*).

CORFO: *Corporación de Fomento*. A large government holding company that owes the majority of water and sanitation companies in Chile.

DGA: The General Water Directorate (*Dirección General de Aguas*).

MOP: Ministry of Public Works (*Ministerio de Obras Públicas*).

SSS: Superintendence of Sanitary Services or SSS (*Superintendencia de Servicios Sanitarios*).

5. **MEXICO**.

API: Integral Port Administration (*Administración Portuaria Integral*).

ASA: Airports Administration Agency (*Aeropuertos y Servicios Auxiliares*).

CNA: National Water Commission (*Comisión Nacional de Aguas*).

CFE: Federal Electric Commission (*Comisión Federal de Electricidad*).

CRE: Energy Regulatory Commission (*Comisión Reguladora de Energía*).

DF: Federal District (*Distrito Federal*).

FNM: National Trains of Mexico (*Ferrocarriles Nacionales de México*).

INE: National Institute of Ecology (*Instituto Nacional de Ecología*).

LAU: Exclusive Environmental License (*Licencia Ambiental Unica*).

LFC: *Compañía de Luz y Fuerza del Centro*. Electric utility (subsidiary of CFE) for the Federal District.

NAFTA: North American Free Trade Agreement (*Tratado de Libre Comercio de Norte América*).

PROFEPA: Federal Attorney General's Office for Environmental Protection (*Procuraduría Federal de Protección al Ambiente*).

SE: Energy Secretariat (*Secretaría de Energía*).

SEMARNAP: Secretariat for the Environment, Natural Resources and Fisheries (*Secretaría de Medio Ambiente, Recursos Naturales y Pesca*).

STC: Communications and Transportation Secretariat (*Secretaría de Comunicaciones y Transportes*).

6. PANAMA.

APN: National Ports Authority (*Autoridad Portuaria Nacional*).

CIPSP: IDAAN's Privatization Committee (*Comisión de Incorporación de la Participación del Sector Privado*).

CCP: Panama Canal Commission (*Comisión del Canal de Panamá*).

CONAMA: National Environmental Commission (*Comisión Nacional de Medio Ambiente*).

ERSP: Public Services Regulatory Agency (*Ente Regulador de los Servicios Públicos*).

IDAAN: National Institute of Water and Sanitation (*Instituto de Acueductos y Alcantarillados Nacionales*).

INRENARE: National Institute of Natural Renewable Resources (*Instituto Nacional de Recursos Naturales Renovables*).

IRHE: Water Resources and Electricity Institute (*Instituto de Recursos Hidráulicos y Electrificación*).

MIPPE: Ministry of Planning and Economic Policy (*Ministerio de Planificación y Política Pública*).

MOP: Ministry of Public Works (*Ministerio de Obras Públicas*).

7. PERU.

CONAM:	National Environmental Council (<i>Consejo Nacional del Ambiente</i>).
CEPRI:	Special Privatization Committee (<i>Comité de Privatización</i>).
COPRI:	Committee to Promote Private Investment (<i>Comisión de Promoción de la Inversión Privada</i>).
CORPAC:	Airports and Commercial Aviation Corporation (<i>Corporación Peruana de Aeropuertos y Aviación Comercial</i>).
DGAA:	General Directorate of Environmental Affairs (<i>Dirección General de Asuntos Ambientales</i>).
DGMA:	General Directorate of Environment (<i>Dirección General de Medio Ambiente</i>) of the MTCVC.
ENAPU:	Nacional Ports Enterprise (<i>Empresa Nacional de Puertos</i>).
EVAP:	Environmental Evaluation studies (<i>Evaluación Ambiental Preliminar</i>).
MEM:	Ministry of Energy and Mining (<i>Ministerio de Energía y Minas</i>).
MTCVC:	Ministry of Transportation, Communications, Housing and Construction (<i>Ministerio de Transporte, Comunicaciones, Vivienda y Construcción</i>).
OSINERG:	Energy Investment Supervisor Bureau (<i>Oficina de Supervisión de Inversiones en Energía</i>).
OSITRAN:	Transportation Investment and Infrastructure Supervisory Organization (<i>Organismo Supervisor de la Inversión en Infraestructura de Transporte de Uso Público</i>).
PERT:	Special Project for the Rehabilitation of Transportation Infrastructure (<i>Proyecto Especial de Rehabilitación de Infraestructura de Transporte</i>).
PROMCEPRI:	Private Concessions Promotion Commission (<i>Comisión de Promoción de Concesiones Privadas</i>).
SEDAPAL:	Water and Sanitation Services Company of Lima (<i>Servicio de Agua Potable y Alcantarillado de Lima</i>).
SUNASS:	Superintendence of Sanitary Services (<i>Superintendencia Nacional de Servicios Sanitarios</i>).

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1. **Executive Summary.**

For years, most public service entities in the Latin America Region have been in the hands of government-owned enterprises providing -in average- a less than acceptable service. In order to improve their efficiency, reliability and increase their coverage, the governments have been immersed in programs of state modernization in which privatization has been one of the most widely used instruments. The traditional role of governments has been switched to a state in which its main role involves the regulation (when needed), enforcement, and promotion of private participation. Pioneer countries like Chile (in the 1970s), Argentina and Mexico (in the early 1980s), followed different schemes and strategies. They were later emulated by several other South American countries and most recently by Central American and Caribbean nations.

Even though the privatization activities are carried out following many and various schemes and approaches, it is a fact that they all have had an impact on the social, economical, political and environmental aspects of those nations. The Region has important but fragile ecosystems that have been affected by years of environmental mismanagement. Many believe that privatization is a “golden opportunity” to put “the house in order”. This would be true if the process feeds from lessons learned and follows a rational and sustainable approach.

This study provides an environmental evaluation of the privatization of public services in the Region. It was comprised of field visits, interviews with practitioners, managers, consultants, multinational organizations officials and decision-makers, review of pertinent documentation, analysis of all the data collected, and discussion of environmental issues of privatization practices in a workshop in April of 1998. The study has the following specific objectives:

- a. To review pre-privatization conditions, privatization schemes and environment concerns in Argentina, Bolivia, Chile, Mexico, Panama and Peru.
- b. To perform an evaluation of environmental practices in the privatization of energy, transportation, water and sanitation services in the Region with emphasis in the countries listed above.
- c. To discuss issues and lessons learned from proper environmental practices before, during and after the privatization of public services, and to generate general conclusions, including some broad environmental guidelines for the privatization of public services.

Privatization of public services and the environment in the Region.

In the 1970s and 1980s, public enterprises were privatized with little or no concern for the environment. As environmental awareness increased at the end of the 1980s, it became apparent that those issues were, in the majority of cases studied, of key importance for the proper privatization of public services.

After evaluating the privatization of public services in the countries listed above, the following is a summarized listing of the main issues found:

- a. **Environmental problems with or without the privatization of public services.** It is important to differentiate environmental problems that are independent of the process (which may remain or disappear after privatization is completed), and those that are strictly related to the process itself (and may emerge when privatization occurs). Even though the two problems may be related in one way or another, they require different approaches towards a solution.

- b. **Legislation.** It was found that a massive amount of privatization laws have been developed in the Region. However, from all points of view, environmental norms/regulations are still below desired levels.
- c. **Institutional arrangements.** Many institutions have been created for the transfer and regulation of the newly privatized organizations. However, few environmental organizations were created or refurbished for their new role (as regulators of private sector environmental activities), and this situation is accentuated by the chronic lack of resources needed to achieve their objectives.
- d. **Policy and political will.** It was found that governments have been very active in creating diverse sets of privatization frameworks but do not necessarily have the political will for fully integrating environmental protection, conservation and restoration issues.
- e. **Regulation.** Governments in the Region have created regulatory agencies that, in some cases, not only deal with economic allocative efficiency issues, but also award licenses and enforce environmental contractual agreements and laws. This may not be the best arrangement (regulators should have well defined regulatory duties and not be expected to be environmental specialists). Environmental matters should be assigned to appropriate agencies/authorities.
- f. **Standards.** Most privatization contractual agreements refer to a determined set of environmental standards. Several countries have made considerable progress and have quite acceptable ones, others do not. However, effective compliance and enforcement of any standards revolve around not necessarily the current or the ideal ones, but the achievable ones. Several large multinational enterprises acquiring public services in the Region are conscious of the need to follow the standards from their own first-world countries or those provided by international institutions.
- g. **Monitoring, auditing and enforcement.** Environmental monitoring, auditing and enforcement is the weakest link of environmental management in the Region. Most countries either do not perform it or do it at less than acceptable levels, in spite of it being one of the most important issues in the privatization of public services. However, there is a trend that is slowly increasing the quality and quantity of this vital component. The completion of laws and norms, and the strengthening of environmental institutions are of tremendous assistance in this matter.
- h. **Environmental liabilities.** Environmental liabilities are a burden to all stakeholders. They need to be identified and evaluated, and a realistic and achievable remediation program must be found and implemented. It was found that several former public service enterprises had created sizable environmental liabilities (some of them with high hazardous levels) accumulated through long periods of time and space. Thorough evaluations and development of remediation plans are becoming more popular but there is still room for improvement. New owners/concessionaires (usually large multinationals) are very aware of the cost of environmental liabilities and seek a clear-cut solution at the beginning of their operations. The commitment alone made by some nations that they will clean up environmental stocks is not a true guarantee of appropriately handling those hazards. If the governments are in charge of handling environmental liabilities, it should be expressed in contractual terms and reflected in a remediation plan to follow.
- i. **Environmental impact studies.** Most public service enterprises are transferred to the private sector in precarious conditions which makes them go through a process of restructuring and often significant physical/managerial changes are made. This may affect the surrounding environment and an environmental impact study is usually needed to determine its true effects and mitigation measures.

Environmental impact assessments (EIAs) and similar studies are becoming more common in the Region and most countries have already, or are in the process of having mandatory regulations that require EIAs for most activities, including privatized enterprises.

- j. **Public awareness, involvement and participation.** In few countries, the law requires public involvement and participation in the environmental decision-making process for newly privatized enterprises. In some sectors, mainly energy and mining, the results have been quite favorable. However, this is more the exception than the rule. The Region has not made serious advances in increasing transparency and involvement of all stakeholders.
- k. **Financing, investment and incentives for environmental enhancement.** Post-privatization environmental conservation and enhancement produces known benefits but carry some costs as well and should be reflected in the public services tariffs. The private sector is also interested in financing environmental enhancement activities in the privatization process. However, interested financial institutions were not successful in financing those operations mainly due to low tariffs and excessive politicization of public services by local and national authorities.
- l. **Privatization contracts.** It has been found that privatization contract development is a lengthy but valuable process that starts at procurement. Contracts affect environmental outcomes and vice-versa. Such agreements should closely comply with the environmental law, policies and regulations and, in its absence, contingency mechanisms should be in place for clarifications and/or disputes. In it, all matters related to environmental liabilities, assessments, monitoring, auditing, enforcement, among others should be included. Transitory clauses are used to define the details of mitigation and/or rehabilitation activities (schedules, goals, and responsibilities).

Conclusions and Recommendations.

The transfer of public services enterprises to the private sector domain raises the issue of responsibility for environmental impact, from directly related past, ongoing and future operations, to more comprehensive (broader) concerns of environmental management.

When it comes to environmental issues directly related to the privatization of public enterprises, it was found that several public services enterprises in the Region had mismanaged their production and waste handling practices. This has caused serious pollution stocks and/or left behind significant environmental risks for the near future, forcing the parties in the privatization process to clean up contaminated sites, mitigate, contain or abate damages, and/or compensate or provide medical assistance to victims. Ongoing operations of the privatized enterprises are also a source of significant pollution flows. Some incremental negative impacts are related to: (i) the consumption of natural resources in an accelerated unsustainable manner, (ii) the tendency of governments to freeze up standards, regulations and enforcement, and (iii) the revival of polluting firms that would otherwise go out of business. There are, however, some positive environmental impacts that would help reduce pollution flows: (i) governments may be forced to develop, update and/or reinforce regulatory policies, laws and regulations and institutional strengthening, and (ii) privatized firms in the Region have adopted a more rational approach in the use of natural resources and adopted cleaner technologies.

The State's broader environmental issues, which are not a consequence of privatization itself, indirectly affect the private participation process and the environment in many ways. It was found that those issues are mainly related to policy, legal and institutional arrangements during pre-existing, ongoing, and future conditions. The issues that affect pre-existing conditions are related to: (i) responsibility of environmental

liabilities, (ii) the degree of effectiveness of public agencies in terms of cleanup and other measures to mitigate liabilities and contain or compensate for damages, (iii) institutional arrangements that ensure a proper follow up for monitoring, auditing and enforcement, (iv) capacity of the administrative and judicial systems for implementing legislation/regulations on liabilities, (v) organizations capable of implementing and enforcing policy, legal and regulatory mechanisms, and (vi) transparency and public participation.

This study has concluded that most public service enterprises in the Region, and the organizational cultures and realities in which they are immersed are so diverse, that it is very difficult (if not impossible) to come up with “cookbook” best practice recommendations on how to guarantee environmental sustainability in all privatization cases. However, the depth of this study has made it possible to distill some very general guidelines, which are listed in section 6.3. Those guidelines were developed based on the stages of the project cycle: project preparation, implementation and (post) completion.

It is no secret that environmental issues now have a place in the privatization of public services in the Region. It has been found that privatization is driven from within the government whereas environmental protection and conservation is the result of outside pressure exerted on governments by civil society and by multilateral financial institutions. However, it is also known that considerable progress has to be made and that there is the willingness to promote environmentally responsible projects.

Based on extensive field work and analysis of data collected, below are some recommendations for the multinational financial institutions for improving the privatization of public services in the Region:

- a. Improve monitoring, auditing and enforcement mechanisms and institutions.
- b. Promote technical competence and financial sustainability of regulatory agencies.
- c. Increase participation of the public in matters of privatization by means of education and environmental awareness programs.
- d. Develop an environmental source-book for privatization of public services.
- e. Create or improve environmental databases of privatization enterprises.
- f. Support internal educational initiatives related to environmental management and the privatization of public services.

The study concludes by asking if privatization of public services has improved the environmental quality in the Region. Information gathered shows that it is not feasible to determine the precise effects of the process, and thus it is impossible to give a concrete answer. There are important signs that considerable progress has been made, but due to the long-term maturity of privatization engagements, final conclusions would be premature.

Multinational development financial organizations have been key players in improving environmental awareness in the Region. By doing so, and by showing borrowers the profits of sustainable development, the privatization of public services in Latin America can prove to be a successful venture. A process in which the environment, the general public, buyers, and sellers benefit immensely not only in the near future, but in the long term as well.

2. Introduction and Objectives.

Traditionally, governments in the Region owned enterprises of public services providing a sub-optimal product. The level of provision of those services was biased towards the few larger and richer cities, with little or no consideration for the environment. This trend was observed in the energy, transportation and, specially, in the water and sanitation services. For instance, in Mexico in 1990, 16.7 million people lacked access to potable water and 28.8 million did not have any sewerage services. Of the 250 m³/s that were provided to the population, 160 m³/s returned to water bodies as wastewater and of this total 10% at most was treated. Still in 1994, cities/towns with less than 500 people got 48% and 26% of water and sewerage services, respectively, while cities with 80,000 people or more got both services over 90% (Ozuna and Gómez, 1996).

Until the 1980s, most public service institutions in the Region were in precarious financial terms, and in a deep management crisis that resulted in extremely low efficiency and efficacy levels¹. However, after the “lost decade” of the 1980s, the Region has been immersed in public sector restructuration programs. The goals were to increase the cost-effectiveness of their administrative duties and to increase the availability and reliability of the provision of their services. The governments, with the support of multinational financial institutions, implemented a series of activities to achieve those goals, from which one of the most important was the privatization of public services².

The transfer of key public services to the private sector has replaced the traditional role of governments to a state in which its main role involves the regulation (when needed), enforcement and promotion of private participation. New policies have granted the private sector a central role in managing large enterprises, most of them with monopolistic characteristics. To accomplish this, the Region’s governments have developed an impressive amount of privatization institutions and legal arrangements. Even though the privatization activities are carried out following many and various schemes and approaches, it is a fact that they all have impacted the social, economical, political and environmental aspects of those nations.

The privatization experience in the Region is quite diverse. Countries like Chile and Argentina started their activities in the 1970s and early 1980s, respectively, followed by Mexico in the mid-1980s. In the beginning of the current decade, privatization efforts were implemented by some other countries in South America and, more recently, by the remaining nations in the Region. Multinational institutions were, relatively speaking, not as closely involved (as they are now) in the initial efforts³. Also, during the early years of the 1980s, environmental conservation in the Region did not have the high priority that it attained years later. This affected the way environmental issues were handled during the first attempts at privatization.

The private sector in the Region is having a stronger participation everyday and has a persistent interest in public enterprises. For instance, Figure 1 gives an idea of how much has been achieved by showing the cumulative value of all privatizations (price paid by the private firms) with respect to countries’ Gross Domestic Products during 1988-1995 (IDB/OCE, 1997). Even with the relatively medium/high political, economical, social and financial risk in the Region, structural changes made seem practically irreversible

¹ There were some notable (and very few) exceptions in the Region. Chile and Costa Rica invested heavily in providing wide availability electricity and water services to all of their citizens. For instance, Chilean water utilities increased the population’s access to drinking water from 25% in 1965 to over 95% today. However, this stands more as the exception than the rule.

² The governments also privatized many other companies that were involved in merely commercial activities (airlines, banks, sport and game enterprises, factories, tourism infrastructure, etc.).

³ Initial privatization efforts were financed by domestic and international commercial financial institutions.

creating a positive and forward looking environment for private investment. There is a trend which shows that this process will continue into the next century⁴. A good example of private sector growth is the electric utilities. Companies like Chile's Enersis, considered a medium size company few years ago, has truly become a multinational enterprise owning over \$10 billion in assets and dominating Chile's power sector. It is also a big player in Argentina and Peru, and has a growing presence in Brazil and Colombia (Friedland, 1997).

Private sector risk mitigation is also being applied by diversification of services within the utilities business. This is the case of powerful energy firms entering the water/sanitation sector. Enersis has a water division that operates the wealthy suburb of Lo Castillo in Santiago. The company, although not a monopoly, controls the Santiago area (through Chilectra) and 60% of the generating capacity of the main national grid (through Endesa). Enersis is responsible for 12% of Chile's gross domestic product. Critics charge that there is too much control of the country's utilities in the hands of one company.

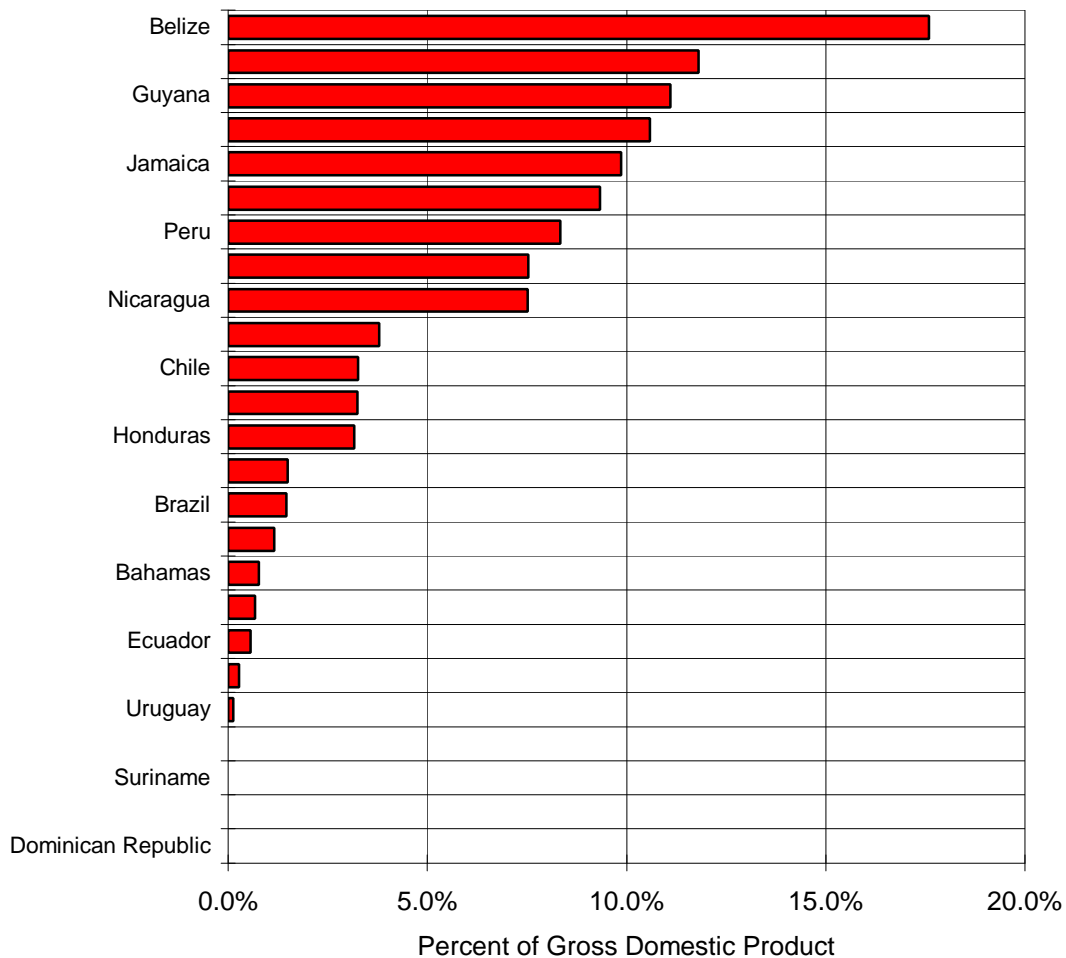
The performance of public utilities, through considerable modernization efforts, is still way below its acceptable standards. As shown in this report, some sectors have already shown signs of immediate recovery (electricity, for example), others will require more time to see tangible results (water/sanitation concessions), and others have not been as fortunate and privatization had to be reversed (road concessions in Mexico, for example).

The necessity of appropriate managerial and technical skills has to be compensated with the enormous infrastructure investment needs. The World Bank (WB) estimates that \$115 billion in investments will be required over the next 10 years, including \$50 billion in water supply and \$65 billion in wastewater. The IDB alone is committing \$3 billion to water/wastewater projects in the Region before the end of the century, or 20% of its total lending budget (Poole, 1997).

Most of all, private participation activities in the Region are having a significant impact in the environment. To determine the correct policies for the future, it is important to make an evaluation of what has occurred, and distill conclusions from lessons learned. This will assist institutions like the IDB to develop plans and complete strategies for protecting and rehabilitating the Region's diverse but fragile ecosystems. As shown in this document, most public services utilities are closely related to the environment. Its conservation will not only enhance and increase business opportunities, but also attain a true and sustainable development, beneficial to all involved.

⁴ There are still several countries (like Brazil, Venezuela, and some in Central America) that are just starting an aggressive move towards privatization.

Figure 1. Cumulative Value of Privatizations as a Percentage to their Gross Domestic Product for Countries in the Latin America and Caribbean Region, 1988-1995 (IDB/OCE, 1997).



With the purpose of collecting and disseminating environmental privatization practices and effects, the IDB carried out this study in the energy, transportation, water and sanitation sectors⁵. Six countries were visited and analyzed *in situ* (Argentina, Bolivia, Chile, Mexico, Panama and Peru), several privatization initiatives were analyzed and evaluated, and discussion of environmental issues of privatization practices were carried out in a workshop in April of 1998 at IDB Headquarters.

The objectives of this study are:

- a. To review pre-privatization conditions, privatization schemes and environment concerns in the Region (Chapter 3).

⁵ Some mining privatization environmental experiences were considered for Peru and Chile, given the size of those industries, and the interesting results of their endeavors.

- b. To perform an evaluation of environmental practices in the privatization of energy, transportation, water and sanitation services in the Region with emphasis in the countries listed above (Chapter 4 and Annex A).
- c. To discuss issues and lessons learned from proper environmental practices before, during and after the privatization of public services and to generate general conclusions, including some broad environmental guidelines for the privatization of public services (Chapters 5 and 6).

3. Privatization and Environment Concerns in the Region.

3.1. The privatization of public services.

Public services enterprises are, as its name indicates, those companies that provide basic services to any member of a community. Among them are: water and sanitation, transportation, energy-related (gas, oil and electricity), telecommunications, education, health, recreation, etc. In the late 1800s and mid-1900s both the private and public sectors had shared ownership. Several South and Central American countries had private or mixed enterprises for telephone, electricity, gas, transportation and even water and sanitation. However, the Region experienced a nationalization wave in the 1960s to 1970s, concentrating ownership mainly in a large public sector.

In the 1980s, the governments of the Region began experimenting with privatization of public enterprises.. As a result, many state companies like banks, airlines, factories and even racehorse tracks were passed to the management of the private sector. The impressive decrease in the quality and reliability of most public services (especially in the 1970s and 1980s), motivated the Region's governments to seek the participation of the private sector in the provision of those services.

It is important to note that the privatization of public services enterprises (in the Region) substantially differ from the privatization of any other private participation venture because: (i) they provide key services for preserving the life, health and economy of inhabitants and the quality of the environment, (ii) in general, there is a deficient supply of public services with a considerable unattended demand, (iii) public services rates and distribution have been politically manipulated with a long tradition of subsidies and government interference, (iv) those services are usually supplied by natural monopolies that require a distinctive regulatory framework, (of which the Region has little experience⁶), and (v) decisions involve a long-term horizon due to the nature of large cost recovery investments⁷. There is virtually no culture of long-term decision making and planning for public utilities in the Region.

Even in the public services studied, important differences exist. For instance, electricity services are different from water supply and sanitation. In some areas of the Region, there is the impression that water supply is a "common good" and all members of the society have the right to its consumption. Water and electricity utilities are also quite unique from the privatization point of view. Water/sanitation enterprises usually maintain their vertically integrated structure for economic and efficiency reasons. Electricity utilities have been deliberately divided into generation, transmission and distribution enterprises in order to increase efficiency and avoid monopolistic extremes, making them closer to a more competitive market.

Privatization of public services is defined as the turning over of a public service enterprise to private interests. It usually involves: (i) transfer of management (control) and/or ownership (total or partial) of enterprises from the public sector to the private sector, and (ii) transfer of financial assets from the public sector to the private sector (Vernon, 1989). Most common objectives for privatizing public institutions are (Dekock, 1994)⁸:

⁶ Even until now, several utilities in the Region act not only as suppliers but also as self-regulators. The situation is changing and independent regulators are being created.

⁷ For instance, the construction of a conventional secondary wastewater treatment plant for a population of 1 million, requires a capital investment of about \$100 million, and its subsequent operation and maintenance demand an additional steady and substantial expenditure (Idelovitch and Ringskog, 1997).

⁸ Not listed in a specific order of priority.

- a. To increase the internal efficiency of public enterprises.
- b. To intensify competition in the good/services and financial markets.
- c. To alleviate financial problems of the public sector (diminish public deficit, external debt service and elimination of subsidies).
- d. To increase public participation in the ownership of enterprises by promoting “popular capitalism” (ownership by citizens) or “labor capitalism” (ownership by the workers of an enterprise).
- e. To transfer to the private sector some enterprises which have no current valid reasons for remaining public.
- f. To ease the process of reengineering the public sector.
- g. To develop the domestic capital markets.
- h. To “immunize” public administration from political manipulation.

Public services in the Region are provided, in general, by four different kinds of enterprises that have the following general characteristics:

- a. **State-run enterprises.** Solely owned and operated by central, and even, local governments, which make them vulnerable for political manipulation. They are usually self-regulated and generally lack transparency and accountability for their activities. Private involvement is non-existent or is limited to minor outsourcing activities. As shown in Appendix A, of all state-run enterprises researched, few have maintained a sound record of environmental management. Even with the privatization wave in the Region, most water and sanitation utilities and public transportation services are still owned and operated by governments. This is not the case of energy enterprises from which a large number of them have been already transferred to the private sector.
- b. **Corporatization.** Occurs when a company or a holding of enterprises acts as private firms but are still owned by the government. In some cases the private sector has minority ownership. This kind of organization is subject to a code of conduct and a level of regulation, and is exposed to some scrutiny by other agencies. Some accountability is established. Many enterprises of this kind are still not very different from the state-run ones and have inherited many of their caveats, especially with regards to environmental management matters. However, an example of good management is Chilean holding CORFO who owns several public service utilities.
- c. **Private monopoly.** Privatization of state owned monopolies are converted to private monopolies. In general, the new firm increases its efficiency and level of service but a higher cost to consumers. As any other private venture, its main purpose is to maximize profit; leaving the social and environmental issues aside. In most cases, the governments create a regulatory agency in order to simulate market forces and competition.
- d. **Deregulation.** By deregulating the markets, entrance restrictions are abolished and the private sector starts providing services that were reserved for the public sector. Healthy competition may reduce prices and increase efficiency. Examples of market deregulation are the competitive and efficient

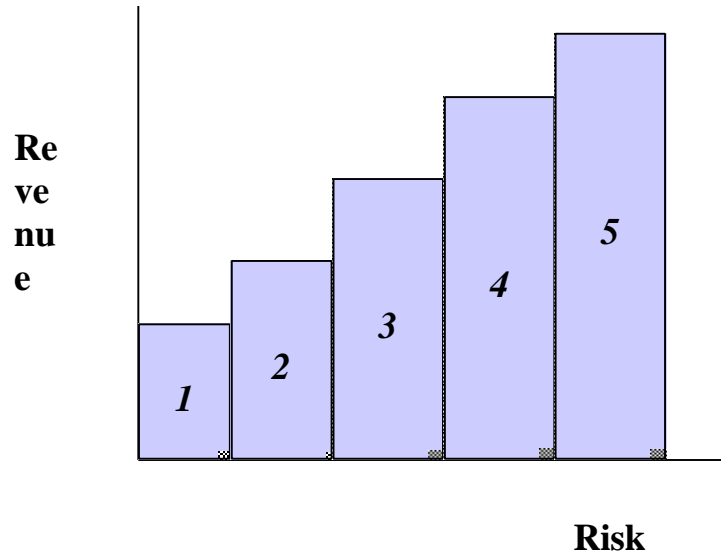
telecommunications in Chile and, in some way, the electricity generation market in Argentina. However, most public services are, by nature, natural monopolies making them impossible to deregulate.

In all cases mentioned above, even with the reduction of prices and efficiency increases, there is no guarantee of reduced pollution, mitigation of environmental liabilities or increase of environmental sensitivity. Governments have a role of not only enforcing the environmental laws but also providing the incentives to reduce current, past and future externalities.

In order to uniform privatization definitions, the following general classification of privatization activities by revenue and risk (see Figure 2) helps understand the different instruments available:

1. **Management contracts.** A private firm assumes the responsibility of managing an enterprise and is compensated for that. It has full management authority but it has limited exposure to financial and other risks.
2. **Infrastructure operation.** An operator is hired to be in charge of a plant or facility but under contractual obligations and, most of the time, following policies and strategies given by the public sector. This scheme is well known in the operation and maintenance of water and wastewater plants. In the US, where it is widely used, they are called operation, maintenance and management contracts (OM&M). OM&M contracts may be detailed and lengthy but the essentials remain the same -service and compliance for a reasonable price (LaFargue, 1998).
3. **Concession.** The private investor is engaged in a time-sensitive (usually long-term) lease-type contract with the government. The concessionaire undertakes the management and operation of the enterprise and assumes full commercial risks. The government is compensated according to the terms stipulated in the contract.
4. **Build, operate and transfer (BOT).** A private firm is responsible for building a facility, fully operating it for a determined extended period of time and, at the end, transferring it to the public sector. A variation of this is a BOOT (built, own, operate and transfer), in which the facility is owned by the private firm involved in the process. There are three arrangements that fit in this category: the “build, lease and transfer” (BLT), the “build, own and lease” (BOL) and the “external energy supplier” (PEE). A PEE is an independent operator of a generating power plant with a long-term supply contract.
5. **Ownership.** A private firm which buys assets from an existing utility or builds, operates and owns (BOO) a new one.

Figure 2: Privatization activities by revenue and risk (numbers in columns correspond to categories above).



3.2. Pre-privatization and environmental conditions.

For decades before the 1980s, large enterprises providing public services in the Region were owned by central governments. In many cases state-heavy economies did not take into account sustainability and environmental concerns, and the state’s dual role as a regulator and participant in the economy created strong conflict of interest which constrained effective environmental policies. However, two fundamental shifts have occurred in the region since the 1980s: re-democratization and revitalization of the private sector.

State control of politics and economies has been rejected in favor of democracy and a strong market orientation, reflecting widespread skepticism about government competence and emerging from the economic stagnation of the 1980s. Governments are withdrawing from active participation in markets to a role as guarantors of fairness under competitive market conditions, promoting the growth of international trade and investment (WWF, 1997). Economic reforms have stabilized and strengthened many economies in the Region; Gross Domestic Product growth has recovered from the crisis of the 1980s, reaching an estimated 3.6 percent in 1996, compared with 0.8 percent in 1995 and even negative values in the 1980s. Net private capital inflows increased to an estimated \$74 billion in 1996, compared with \$53 billion in 1995; portfolio investment flows have risen from virtually nothing in the 1980s to one-quarter of resource flows, at \$14 billion in 1995. Inflation continued its downward trend in the Region, from over three and four digit values in the 1980s to an average of 30 percent in 1995 to 23 percent in 1996. Fiscal deficits declined from an average of 4 percent in 1995 to 3 percent in 1996 (IFC, 1997).

Today, democracy is spreading, the private sector’s performance is dramatically improving, productivity and exports are on the rise, per capita income is growing, and inflation continues to fall. Against this bright economic picture, overcrowded and polluted cities, persistent poverty, and threatened biodiversity stand in stark contrast.

According to the World Bank (Partridge, 1996), more than 70% of Latin America’s people live in urban areas. An estimated 300 million city dwellers generate 225,000 tons of solid waste every day, much of which is discharged into water bodies, open dumps and wetlands, contaminating surface and ground water. Less than 5% of cities’ sewage is appropriately treated. Urban air is severely polluted by motor vehicles and uncontrolled industrial emissions. More than a third of the Region’s people live below the poverty line. Most

of the 40 million indigenous population, the bulk of the ‘absolute poor’, are excluded from the development process and deprived of income opportunities and basic public services like education, health and housing.

The Region is the most biologically diverse on the planet, but its biodiversity is being severely threatened. The Amazon Basin alone harbors about 90,000 known species of higher plants, 950 bird species, 300 reptile species, 3,000 fish species, and uncounted millions of insect species. But forests, grasslands, wetlands, coral reefs, and other natural habitats are being severely degraded or destroyed (WB, 1997).

For many, privatization can be the “golden opportunity to put the house in order” and use it to align economic growth with social equity, sustainably manage biologically diverse areas and control urban and rural environmental problems. For others, privatization is just a way to eliminate liabilities that create a financial burden to the states, but without giving any consideration to the irreparable and irreversible damages to the environment they have caused. In any case, privatization is still very popular with political leaders in the Region and is very likely that the trend is going to continue into the next century.

Pre-privatization conditions of Obras Sanitarias de la Nación in Argentina (*).

Obras Sanitarias de la Nación (OSN) was the Argentinean national water utility since 1870. Until 1980 it had national jurisdiction but it later became the water company for the Greater Buenos Aires (**). In 1985, OSN had the following characteristics:

- **Regulated area:** 281,500 ha, from which 50,900 ha had water supply and 37,400 ha sewerage availability.
- **Total serviced population:** 8.4 million, from which 5.5 million had water supply and 4.6 million sewerage.
- **Water production:** 3,578,000 cubic meters per day.
- **Water connections:** 1,002,176 but only 148,354 had measurement devices.
- **Sewerage connections:** 665,347.
- **Wastewater treatment:** 97,080 cubic meters per day.
- **Number of employees:** 9,000 with an average age of 52 years; only 50% involved in fieldwork.
- **Consumption:** 600 liters/person/day. The UN World Health Organization considers that 400 liters/person/day is a reasonable consumption for a city with more than 1 million inhabitants.
- **Age of the water network:** 83% was 40 years or older; 55% was 60 years or older.
- **Time for repairing water leaks:** 1 month in the City of Buenos Aires and 2 months in its suburbs.
- **Real tariff (1960=100):** 19.6 (average of all public services = 128.1).
- **Delinquent payment:** 85% (average delay in payment: 2.5 years in the Federal Capital).
- **Real Salaries (1978=100):** 164.1 (average for all public services = 124.1).
- **Annual absence record:** 20.4% (average for all public services = 14.5%).
- **Labor cost/total income:** 57.0 (average for all public services = 25.6).
- **Investment (in 1991 US\$ million; 1981=100):** 67.8 (average for all public services = 67.8).

*: Most information taken from Artana *et al*, 1996.

** : Includes the Federal Capital (Buenos Aires) and 13 “partidos” (districts/suburbs).

3.3. Privatization's major environmental concerns in the Region.

In recent years, the Region has experienced an increased level of awareness about its delicate ecosystem. This heightened concern about the environment has permeated both private and public sectors, and is beginning to play an important role in privatization endeavors. Efforts are being made to reconcile sustainable development with profitability. However, in order to achieve environmentally sound privatization initiatives, the full cooperation of government, private companies and stakeholders is required. The following are issues that need special consideration:

- a. Policy, legal and normative frameworks should be developed and/or implemented.
- b. Regulatory agencies with close coordination ties to environmental institutions need to be created and/or strengthened. Environmental agencies should have full authority to enforce the law and penalize violators as needed.
- c. Institutional arrangements and assignments of resources for monitoring and enforcement need to be developed further throughout the Region.
- d. The assessment and accountability for environmental liabilities, and the commitment to remediate problems are responsibilities that must be assumed by the government, the new private owner or both.
- e. Measures to increase transparency and accountability of private sector investments, as well as the involvement of the general public in the decision-making process, are also key issues in promoting environmental stability.
- f. An effective feedback mechanism which promptly responds to changing situations, increasing pollution flows and stocks, and incremental impacts, needs to be established and/or improved.

4. Environmental Evaluation of the Privatization of Public Services in the Region.

A summary of the environmental evaluation of the privatization of public services for those countries visited is shown below. A detailed description of findings is provided in Annex A.

For each country additional information on environmental issues in the privatization of the public services is described in a summary table. Each table contains the following information:

- **Coverage level and year of privatization:** indicates the kind of spatial privatization coverage (at different levels: federal, national, municipal, provincial, city, etc.). It also includes the year in which the privatization took place (if available).
- **Environmental Liabilities Assessment:** shows if any environmental liabilities assessment has been done prior or during the privatization process.
- **Environmental Impact Assessment:** reveals if an EIA or similar study has been performed during the privatization of the public service. It is assumed that a management plan has been accomplished as part of the EIA.
- **Environmental Monitoring, Auditing and Enforcement:** indicates if monitoring, auditing and compliance mechanisms of the privatized public service are being performed. With this, the environmental authorities can check the effectiveness and efficiency of measures by identifying strengths and shortcomings and recommending corrective measures to optimize the intended outcomes.

Some keywords define the level/status of Environmental Liabilities Assessment, EIA, auditing and enforcement in the tables mentioned above. A glossary of terms follows:

- **Preliminary:** some initial estimates of environmental liabilities, environmental impact assessments or environmental auditing and enforcement have been performed.
- **Basic:** complies with the minimum requirements set by the environmental law and/or regulations of a country or region. In the absence of appropriate legislation, references to international standards are made.
- **Acceptable:** fully complies not only with local legislation but also with international acceptable levels.
- **Not performed:** an environmental assignment/duty is not being performed.
- **Being developed:** an EIA or liabilities assessment is in the process of being elaborated.
- **National:** at a country level.
- **Provincial:** at a provincial level.
- **N/A:** information not available.

4.1. Argentina.

Argentina has been one of the first nations in the hemisphere to implement privatization activities which included a myriad of enterprises: railroads, industrial plants, airlines, banks, roads, ports, water/sanitation companies, electric utilities, etc. Since the 1980s, legislation -mainly at federal level- was produced in order to facilitate the process of privatization and regulation (when needed). For this purpose, several public agencies were created and, in some cases, existing ones were adjusted in order to modify their jurisdictional and authority levels.

At the beginning of the privatization process little attention was given to **environmental issues**. However, by the end of the 1980s, as environmental matters became a more important issue in Latin America, several specific actions were achieved at three governmental levels: federal, provincial and municipal. In 1992, the Natural Resources and Sustainable Development Secretariat (*Secretaría de Recursos Naturales y Desarrollo Sustentable*) was created as the top national environmental authority. The Secretariat is in charge of monitoring and enforcing the law at the federal level, however, its efficacy is questioned by several professionals and institutions.

Several environmental authorities similar to the above named institution were also conceived but at a provincial level. They act at their respective jurisdictions but there are notorious differences among the existing provinces on their degrees of development, environmental management and enforcement. In addition, many environmental and administrative responsibilities are present in numerous government offices, agencies, and institutions from the municipal level up. The Nation's Auditing Institution (*Auditoría de la Nación*) checks environmental compliance of public agencies and their concessionaires. However, it does not have the power to correct (or penalize violations) and can only recommend corrections. The provincial environmental secretariats are involved in enforcement activities but, with few exceptions, they do not perform at desired levels.

The **electric sector** has also been one of the firsts to be concessioned, and almost all generation, transmission and distribution systems are under private possession. It is regulated (since 1992) by the National Electric Regulatory Institution (*Ente Nacional Regulador de Electricidad* or ENRE) at national and provincial level. Besides its normal regulatory duties, ENRE is involved in detailed ruling and contract enforcement, legislation enforcement, and producing decrees and enforcing legislation by issuing sanctions.

During the bidding process, electric environmental liability studies were performed by the private companies and, in some cases, by the government. These studies were not very detailed but provided an assessment of the situation and served the purpose of developing management and remediation plans. Remediation actions followed and several problems were corrected in a three-year period after the concessions were given. Currently, environmental auditing is self-performed by the private concessionaires but ENRE does the verification. An EIA is required for construction of a new power facility or modification of an existing one. Environmental liabilities assessment is performed either by the government (with the results given to the potential bidders) or by the bidding firms.

The environment has benefited well from privatization of the electric sector by having legislation and institutions that guarantee established standards. Due to the fact that the supply is much larger than the demand, only low price producers are selected. These low-price suppliers are forced to have a very efficient infrastructure (usually gas-fueled) which greatly reduces the levels of NO_x and CO₂ for thermal plants, for example.

Argentina is the world's pioneer in the privatization of **water and sanitation** utilities. By the end of 1997, the Greater Buenos Aires Metropolitan Area and the Provinces of Santa Fé and Córdoba⁹ had privatized their water and sanitation utilities¹⁰. The Province of Mendoza and some cities in the Province of Buenos Aires are in the process of being concessioned. The concession contract with the Province of Tucumán has been canceled after a long dispute with province authorities.

The (Buenos Aires) Aguas Argentinas consortium made an evaluation of environmental liabilities and infrastructure prior to privatizing, but a more severe reality appeared after the system was concessioned. A detailed concession contract (including contractual allowable present and future pollution levels) was elaborated, however several issues were left out affecting the outcome of the evaluation. Environmental liabilities included: secondary streams that receive raw sewerage, groundwater contamination from improperly installed septic tanks, invasive mussels in intakes, lack of environmental compliance from the industry, earth (and trash) filling at river banks, illegal dredging in streams, water losses and sewerage overflows, etc.

Aguas Argentinas has not fully attained the goals agreed in the contract due to several factors. According to the concessionaire, they have not gotten the pacted income for new connections (around \$500-600 for water and \$600-900 for sewerage per user). They have turned a money-losing utility (\$200 million a year) into a profitable one without raising rates to customers in real terms (Poole, 1997). However, the concession has not achieved the expected improvement in wastewater treatment and sewerage infrastructure.

The enforcement duties in the Aguas Argentinas concession were transferred to the Secretariat of Natural Resources and Sustainable Development in coordination with the regulatory agency (Ente Tripartito de Obras y Servicios Sanitarios or ETOSS). Aguas Argentinas does its own monitoring but ETOSS audits them with the assistance of private firms, universities and research institutes. ETOSS verifies violations and denounces them to the Secretariat. ETOSS' income for enforcement and its operational duties come from a percentage (2.67%) of the water fee.

Federal **ports** were transferred to the provinces to which they belong and some provinces have already given long-term concessions. Federal Law of Ports mandates that the provinces create their own port authorities which most have done. Some provinces have already given thirty-year concessions to several private concessionaires. No environmental liability evaluation has been done during the transference and no formal environmental audit has been performed during privatization. However, the concessionaires have done some basic evaluation during the bidding process. They have also done environmental impact studies but this was dependent on existing legislation at the national, provincial and even municipal levels.

By the end of 1997, several **airports** were ready to be privatized but this has been postponed. No information about environmental matters was available.

Some federal roads have been concessioned and some others are in the process. All road concessions were given by the Secretariat of Public Infrastructure (Secretaría de Obras Públicas). The National Road Directorate (*Dirección Nacional de Vialidad*, DNV) is the decentralized technical branch of the Ministry, which is in charge of all environmental controls. In the past, road concessionaires were not obligated to perform either environmental liability studies or EIA for the modification of existing roads or construction of new ones. The DNV is currently in the process of including the environmental regulations in the privatization terms of reference and even recommending the type of EIA to be performed. In addition, an IDB institutional

⁹ Aguas Provinciales de Santa Fé and Aguas Cordobesas, S.A., respectively.

¹⁰ A total of six of the 22 provincial water companies have been privatized (Poole, 1997).

strengthening operation is assisting in the development of technical specifications to be used by consultants and civil works contractors.

The DNV can only work at federal level. The provinces are autonomous and are responsible for their roads and environmental issues. The DNV does not perform environmental auditing and neither do the provinces. However, several municipalities and other organizations monitor air quality only.

4.2. Bolivia.

Bolivia has recently changed its central government organization. The agency in charge of privatization is now the Vice-Ministry of Investment and Privatization (*Vice-Ministerio de Inversión y Privatización*), under the Ministry of External Commerce and Investment (*Ministerio de Comercio Exterior e Inversión*). Transportation, energy and water/sanitation sectors are being regulated by several superintendencies. Although each one is independent, they are all related to the National Regulatory System (*Sistema de Regulación Sectorial*). The Ministry of Sustainable Development and Planning (*Ministerio de Desarrollo Sostenible y Planificación*) issues policies, plans, programs and regulations regarding the protection of the environment and of natural resources at national level. It also implements the EIAs and environmental quality control.

Table 4.1. Environmental Issues in the Privatization of Public Services in Argentina.

Service	Coverage Level (Year of Privatization)	Environmental Liabilities Assessment	Environmental Impact Assessment	Environmental Monitoring, Auditing and Enforcement
Water and Sanitation	Greater Buenos Aires Metropolitan Area (1993)	preliminary	basic	preliminary
Electricity	Federal (since 1980s)	basic	acceptable	acceptable
Ports	Federal and Provinces (N/A)	not performed	basic	not performed
Airports ^a	N/A	N/A	N/A	N/A
Roads	Federal and some Provincial (since 1980s)	not performed	being developed	N/A

^a As of December 1997, the privatization process had not yet started.

Environmental management is also the responsibility of *departments* and municipalities. At the departmental level, the *prefecturas* implement and enforce the environmental laws and issue environmental licenses and impose penalties. Municipalities have some limited authority in the execution of environmental policies and monitor standards, and review of the EIAs. All regional and local governments are supposed to have their own environmental units. However, only the large *departamentos* and cities have them in

operating order and carry their mission with partial involvement. As a consequence very little environmental enforcement is being accomplished.

In April of 1992, an environmental framework law was edicted, and then in December of 1995 its regulations were approved. Although the country has an advanced law, most privatized services did not comply with EIAs, environmental liability evaluation and, most importantly, environmental enforcement and remediation plans.

Bolivia gets its electricity from gas (70% of the total national supply) and hydro power plants. Most generation, transmission and distribution have been privatized. Preliminary assessment of environmental liabilities and EIAs have been performed. No environmental auditing and enforcement is carried out.

The oil and gas sector is fully privatized upstream, while only some of the downstream operations are in private hands. The oil and gas public agency called Yacimientos Petroleros Fiscales de Bolivia (YPFB) has made an evaluation of environmental liabilities and the new owners are supposed to carry out remediation activities. In the downstream sector, only retail distributors were privatized. Refineries and storage facilities are still owned and operated by YPFB.

There are regulations of hydrocarbons in which technical, safety and environmental issues are normed and have to be followed by all public and private companies in the sector. The Ministry of Economic Development (*Ministerio de Desarrollo Económico*) has an Energy Directorate with an environmental unit in which its main role is to monitor and enforce environmental legislation for all activities in the sector.

Bolivia has recently privatized its water and sanitation services for the cities of La Paz and El Alto (700,000 and 500,00 habitants, respectively) to a firm called Aguas del Illimani, S.A. All sewerage of the city of La Paz is disposed (without any treatment) to the Choqueyapo River which is used for irrigation of small vegetables. Aguas del Illimani has contractual obligations to implement a mitigation plan. However, during the first five years of the concession, beginning in 1998, the company is supposed to study the problem and present alternative solutions. Aguas del Illimani will also start an industrial pollution inventory in March of 1998. With this information, the company will renegotiate the contract and new sanitation fees will be determined. The city of Cochabamba has recently started its privatization process.

Bolivia's water regulator is the Superintendencia of Waters (*Superintendencia de Aguas*). This institution, the national regulator of all water companies, agreed on water quality levels in the Aguas del Illimani's contract. The concessionaire has the obligation to self-monitor its water releases but the control and certification of a private firm paid by the company, which raises an issue of conflict of interest.

The three main airports (La Paz, Santa Cruz and Cochabamba) have been privatized to one concessionaire. The airport concessionaire (only one company) has contractual investment obligations for a 25-year concession. They have produced an EIA but apparently, there has been no environmental liability evaluation. Environmental enforcement has to be done by the Ministry but there are no signs that this has been achieved.

Bolivia has also privatized two railroad concessions for the operation of an existing system. No environmental liability assessment or EIAs have been performed.

4.3. Chile.

Chile has been a pioneer in restructuring the public sector and has witnessed successful domestic and foreign investment in the provision of public services. Independent commissions (usually attached to different ministries or government agencies) carried out privatization and the executive branch of the government awarded concessions. Multilateral financial institutions have had very little participation in privatization activities.

The National Environmental Commission (*Comisión Nacional del Medio Ambiente* or CONAMA), an inter-ministerial coordination agency with no executive functions, has the main environmental management responsibilities. All execution, inspections and control remain within the Ministries and regulatory agencies (created to regulate privatized public services and private participation). All of them have environmental units who are in charge of environmental affairs.

The Environmental Act (*Ley de Bases del Medio Ambiente*), approved in 1992, mandates the implementation of an Environmental Impact Assessment System and brings to bear the principles of environmental liability, forcing the infringer to repair damages caused to the environment. CONAMA is the institution responsible for the review of the EIAs. Responsibilities for enforcing the EIAs are dispersed among the several sectoral institutions involved in the permit and authorization process. Self-monitoring of industries is encouraged but is not mandatory. Most norms and regulations are part of sectoral legislation that has been introduced in response to emerging situations or problems.

The electric sector has been fully privatized since the early 1980s giving very little or no consideration to existing environmental liabilities. The country lacks oil and gas reserves and gets its electric energy from hydro, carbon and oil power plants. High level emissions (especially in Santiago) have created environmental legal and institutional arrangements to lessen air pollution levels. Since the beginning of the 1990s, Chile is increasing its awareness for environmental conservation. Chile will be importing large amount of gas from Argentina for its cities and booming industry (specially mining). This will curb air pollution and greatly benefit the environment. Electric utility enforcement is done by several local and central government agencies like CONAMA and the Ministry of Health. Utilities also do self-monitoring.

Table 4.2. Environmental Issues in the Privatization of Public Services in Bolivia.

Service	Coverage Level (Year of Privatization)	Environmental Liabilities Assessment	Environmental Impact Assessment	Environmental Monitoring, Auditing and Enforcement
Water and Sanitation	La Paz and El Alto Cities (1997)	basic	Being developed	not performed
Oil and Gas	national (N/A)	basic	N/A	preliminary
Electricity	national (1990s)	preliminary	preliminary	not performed
Airports	La Paz, Santa Cruz and Cochabamba (1997)	not performed	basic	not performed
Railroads	national (1997)	not performed	not performed	not performed

Chile has a very active and progressive mining sector in both private and public ownership. For instance, government-owned mining copper corporation CODELCO has sales that exceed the US\$2 billion per year (represents 50% of mining production in Chile) but invests approximately US\$300 million in environmental matters per annum.

Water and sanitation utilities remained public (with the exception of *Aguas Décima* in Region 10 and other small ones) but acting as true private firms with acceptable profitability and efficiency levels. However, there are few BOOT projects with the regional (public) water companies. One example is a water treatment plant in Antofagasta by British firm Bywater. Most utilities have four different (perpetual) concessions given by the Superintendence of Sanitary Services (SSS), its regulatory agency. These are: (i) water extraction and treatment, (ii) distribution, (iii) wastewater collection, and (iv) wastewater treatment. Each concession has a different tariffs set by the SSS.

The SSS supervises all water companies operations but also develops norms and standards for water, wastewater and liquid releases. Environmental auditing is self-performed but the SSS does random testing (for water supply only). The water utilities render outstanding water supply services but have achieved very little in the provision of environmentally acceptable sanitary services. Wastewater is usually discharged raw to different water bodies and around 10% of the country's sewerage gets any treatment.

The Ministry of Public Works (*Ministerio de Obras Públicas*, or MOP) is in charge through its National Concession Programs (Programa Nacional de Concesiones), of giving concessions for **roads, ports and airports**. All infrastructures to be privatized (as well as any other private or public project to be built or modified) require an EIA in order to obtain a permit from CONAMA. Enforcement during and after construction is the responsibility of the MOP's Inspector (*Inspector Fiscal*) who is authorized to penalize in case of violations. By the end of 1997, several road routes and airports were already privatized. Ports will be privatized starting in 1998; however, several of their facilities have been already concessioned.

4.4. Mexico.

Mexico started its privatization program in the early 1980s. Since then, legal and institutional arrangements were created. However, environmental legislation is universal and does not distinguish private and public enterprises and their changes of ownership.

The main federal environmental institution is the Secretariat for the Environment, Natural Resources and Fisheries (*Secretaría de Medio Ambiente, Recursos Naturales y Pesca, SEMARNAP*). Its principal objective is the promotion of environmentally sustained development and the integral care of the physical components of the natural resources. However, environmental management is also the responsibility of the states and municipalities.

Table 4.3. Environmental Issues in the Privatization of Public Services in Chile.

Service	Coverage Level (Year of Privatization)	Environmental Liabilities Assessment	Environmental Impact Assessment	Environmental Monitoring, Auditing and Enforcement
Water and Sanitation	national (1980s) ^a	N/A	basic	preliminary ^b
Electricity	national (1980s)	N/A	basic	acceptable
Ports	national (future)	N/A	N/A	N/A
Airports	national (mid 1990s)	N/A	basic	N/A
Roads	national (1990s)	N/A	basic	basic

^a Most water and sanitation utilities are owned by the government but managed as private enterprises.

^b Water supply auditing and enforcement is properly carried out by several local and central government agencies. This is not the case of wastewater.

Significant changes (from the privatization of public services point of view) have been included in the Ecological Equilibrium and Environmental Protection General Act (*Ley General del Equilibrio Ecológico y la Protección Ambiental*) in order to initiate the process of decentralization, citizen involvement and strengthening environmental policy instruments. Also environmental offenses are included in the Criminal Code in order to prosecute violators whose actions are harmful to the environment, natural resources, flora and fauna, public health and biodiversity in general. Most states have environmental regulations and authorities but there are significant differences among them.

The National Institute of Ecology (*Instituto Nacional de Ecología* or INE) belongs to the SEMARNAP and has as its main role to develop policy and regulations. It also reviews and approves EIAs and issues environmental licenses. The Federal Attorney General's Office for Environmental Protection (*Procuraduría Federal de Protección al Ambiente* or PROFEPA), an attaché bureau of the SEMARNAP, is in charge of the environmental surveillance of industrial pollution, fisheries and forests (flora and fauna) at the federal level. Several industries/facilities to be privatized were already audited, for example, PEMEX (Petroleos de México) refineries, airports, railroads, and ports. The National Water Commission (*Comisión Nacional de Aguas*) enforces water quality standards at the Federal level.

Since its nationalization in 1938, Petroleos de Mexico or PEMEX is the oil and gas corporation wholly-owned by the government which has the rights of exploring gas and oil reserves, and exclusive rights for exploitation. PEMEX's revenues in 1996 reached US\$ 28,820 for average daily production of 2,855 barrels of crude oil. While there are no immediate plans to privatize this oil and gas conglomerate, government officials acknowledge that opportunities for private participation exists. Since 1995, private companies are sharing storage, transportation and distribution privileges. The lack of new investment and equipment upgrades has led to a number of problems. PEMEX has been wracked by a series of deadly accidents and its older installations have also been criticized for environmental pollution. PEMEX has several environmental units that do auditing and enforcement but information is not widely publicized.

The Federal Electric Commission (*Comisión Federal de Electricidad* or CFE) is a decentralized parastatal entity coordinated by the Energy Secretariat (*Secretaría de Energía* or SE) which has exclusive responsibility for electricity services. It generates, transmits and distributes electricity on a countrywide basis with the exception of some areas in the Federal District¹¹. It is in charge of generation, transmission and distribution. It manages over 44,000 MW of power, has been operational for over 60 years and currently employs approximately 50,000 people.

Around 5% of the electric sector is in private hands. In order to obtain new licenses, applicants must fulfill the environmental requirements of the SEMARNAP. Even though CFE does not need a license from the CRE, they have to comply with SEMARNAP's requirements for new facilities. CFE has an Environmental Protection Section (*Gerencia de Protección Ambiental*) which is in charge of self-monitoring, inspections, supervision of CFE's infrastructure building and environmental auditing.

With large oil and natural gas reserves, Mexico is one of the largest Latin American top energy producers. However, the country needs to add power plants capable of producing 13,300 MW of generating capacity by 2003 to meet the expected growth of demand¹². This would require an investment of more than \$25 billion, and less than one-third of the needed infrastructure is under construction. The prospective shortages are a common concern nationwide but are expected to be particularly acute in major industrial sectors. The only independent power project (IPP) approved to date is known as Mérida III (supported by the IDB), and was

¹¹ Which is served by its subsidiary the Compañía de Luz y Fuerza del Centro or LFC.

¹² In 1998, total electricity sales are expected to reach over 160,000 GW-hours, a 6% increase with respect to 1997 (Friedland, 1998).

supposed to usher in a new era of private sector participation in the energy sector¹³. It is expected that it will offer some of the lowest cost and cleanest power in Mexico, and perhaps even the world when completed in year 2000.

The National Water Commission (Comisión Nacional del Agua or CNA) is an independent and decentralized institution of the SEMARNAP that manages all federal waters (**water and sanitation**). Mexico has a Water Law (*Ley de Aguas*) and regulations with special sections for prevention and pollution control and penalties. The CNA gives two kinds of permits for water use: (i) concessions to the private sector, and (ii) designation or “*asignación*” to the public sector. Both licenses are for specific uses of water, human consumption being the highest priority. Water supply and sanitation quality is monitored by the health authorities and is enforced by the CNA.

There are some water supply privatization experiences in Mexico. One of the most recent is the one in the Federal District (*Distrito Federal* or DF) in which CNA has awarded water supply and sanitation concessions. However, all four concessionaires are finishing the infrastructure inventory and implementation of the commercial system stages. So far, they have not been able to operate and maintain the water/sanitation network and no wastewater treatment has been implemented yet. Other water supply and sanitation experiences are in Cancún, Aguas Calientes and Puerto Vallarta.

Wastewater collection and disposal violate minimum and maximum standards mandated by Mexican law. The government lacks resources for monitoring, developing and rehabilitating appropriate infrastructure. In sanitation alone, Mexico has had several experiences for implementing wastewater treatment plants, mostly implemented by BOT. Private and public sector officials estimate that Mexico needs to invest at least US\$ 6 billion to solve its municipal wastewater needs in major municipalities.

Mexico has a wide experience of road concessions, mostly done by BOT. Between 1987 and 1994, 5,316 km of new roads were built with private participation. However, many highway investors fell victim of higher-than-expected construction costs and with the peso devaluation, defaulted bank loan payments creating a financial crisis. The Mexican government, in order to avoid increasing negative effects to the economy went through a controversial bailout process.

The Communications and Transportation Secretariat (*Secretaría de Comunicaciones y Transportes* or STC) claims it obtained respective licenses before construction or rehabilitation of privatized roads. Now, all privatized new or existing routes require an EIA and environmental mitigation studies. The PROFEPA is in charge of supervising the construction of roads (since 1992). The STC has recently created an environmental unit that is in charge of all environmental duties in the construction or rehabilitation of federal roads.

Mexico City, the largest city on earth, is known for its very high levels of air pollution. The city alone has around 115,000 public vehicles and around 30,000 more come daily from different areas of the State of Mexico. Federal and metropolitan authorities are immersed in the ambitious Program for Improving the Air Quality in the Valley of Mexico. Based on the regulations created and the defined strategies, standards and goals, the government of Mexico City decided to privatize bus Route 100 (*Ruta 100*), one of its largest public routes. This route was declared bankrupt (due to administrative and union deficiencies and after years of large subsidies) with a fleet that violated environmental standards. The city mandated that all buses (all brand new) should follow environmental and safety but unfortunately, the new owners lack either the financial or the managerial skills to function and the process has not developed as expected.

¹³ Approved in 1997, construction started on the 484-megawatt project in Yucatan State on July 1998.

The Mexican railway system has been partially transferred to the private sector. The privatizing agency, the Mexican Railroad System Restructuring Committee, divided the entire system in several routes. So far, three major railroads (50-year concessions) and some smaller ones (30-year concessions) have been privatized. The government has hired international firms to perform environmental audits and has committed the new concessionaires to mitigate all liabilities. However, this audit was performed only at their storage warehouses and maintenance shops and it did not involve all the track lines. The contract specifies that if the new owner finds any environmental liabilities in their routes (i.e. spills) the government will be fully responsible for its cleanup.

The July 1993 Port Law (*Ley de Puertos*) decentralized the port system, establishing the Integral Port Administration (Administración Portuaria Integral or API), specifically at each one of the 22 ports. API, as the landlord, assumes responsibility for the assets, liabilities and administrative functions. At the end of 1997, around of 90% of cargo terminals had been privatized as well as the tourist port of Acapulco. The government claims they will be in charge of mitigating any environmental liabilities but no details of such activities are available.

Privatization of airports has not started yet. As with railroads, the government claims it will give the concessions free of environmental, financial and labor liabilities. The Airports Administration Agency (*Aeropuertos y Servicios Auxiliares* or ASA) is executing environmental audits (through environmental specialty firms) in coordination with PROFEPA.

Table 4.4. Environmental Issues in the Privatization of Public Services in Mexico.

Service	Coverage Level (Year of Privatization)	Environmental Liabilities Assessment	Environmental Impact Assessment	Environmental Monitoring, Auditing and Enforcement
Water and Sanitation ^a	Mexico City (1993)	being developed	being developed	preliminary
Water and Sanitation ^a	Several cities but Mexico (1990s)	N/A	N/A	preliminary
Oil and Gas ^b	national ^d	N/A	N/A	preliminary
Electricity ^c	national ^d	N/A	N/A	preliminary
Railroads	national (1997)	basic	N/A	preliminary
Ports	national (1990s)	N/A	N/A	N/A
Airports	national (future)	being developed	being developed	N/A
Roads and Urban Transportation	Federal jurisdiction and Federal District (since the 1980s)	preliminary	preliminary	preliminary

^a The CNA and local authorities perform water (quality) supply auditing. The PROFEPA and local authorities audit wastewater releases but enforcement is mainly centered around industry and not urban discharges.

^b PEMEX does most environmental monitoring, auditing, planning and enforcement, with involvement from local authorities and PROFEPA.

^c CFE does most environmental monitoring, auditing, planning and enforcement. However, local authorities and the PROFEPA are also involved.

^d Not privatized.

4.5. Panama.

Panama has recently started the privatization of public services. Environmental management, evaluation, control, enforcement and protection responsibilities are distributed in several ministries, autonomous and semi-autonomous institutions and municipalities. The organization in charge of policy development and planning, and coordination of the use and conservation of natural renewable resources is the National Institute of Natural Renewable Resources (*Instituto Nacional de Recursos Naturales Renovables* or INRENARE).

Panama is in the process of developing a General Environmental Act (*Ley General del Ambiente*). Few environmental standards are available (those that do exist are mainly from the Ministry of Health). The government has created the Public Services Regulatory Agency (*Ente Regulador de los Servicios Públicos* or ERSP) which regulates the telecommunications, electricity and water/sanitation sectors. It has the responsibility of enforcing the norms and regulations, and gives concessions (for hydropower plants) and licenses (for thermal power plants) in coordination with several public institutions (including INRENARE).

Generation, transmission, distribution and commercialization of electric power has been provided by the Water Resources and Electricity Institute (*Instituto de Recursos Hidráulicos y Electrificación* or IRHE), a public agency of the Republic of Panama. The government owns most power companies and around 70% of all electricity come from hydropower generation. The remaining has a thermal source.

IRHE has an Environment Management Unit (*Gerencia Nacional de Medio Ambiente*) in charge of watershed management (in basins where hydropower generation occurs) and environmental control and monitoring of thermoelectric power plants and transmission lines. After the privatization, IRHE will either disappear or be reduced to a minimum level. The future of the environmental unit is uncertain and it is unclear who will be in charge of its current responsibilities (especially those related to watershed protection and protected areas management).

IRHE follows its own standards (i.e. emission norms) due to the lack of national regulation. There is an EIA law but it does not have regulations. Law No. 6 dictates the electric regulatory and institutional framework during the privatization of the public agencies. This law has an important environmental component. It gives the authority to the regulatory agency to monitor and enforce the law before the institutional and legal arrangements are created/implemented. It also mandates public participation, the rational use of natural resources and the obligation for mitigation, rehabilitation and compensation of environmental damages.

Environmental enforcement is the responsibility of INRENARE and the Ministry of Health (*Ministerio de Salud*). Each power company has an environmental unit. Environmental liabilities are unknown but a private firm will evaluate them prior to the privatization process (with the financial support of the multinational banking institutions). The Environmental Unit has already prepared the terms of reference.

Panama is not an oil, gas or coal producer. Its oil enterprises have always been in private hands (refineries, transportation and commercialization).

The National Institute of Water and Sanitation, IDAAN (*Instituto de Aguas y Alcantarillados Nacionales*) provides water and sanitation services to seven provinces plus an eighth zone composed of the Panama City Metropolitan area, West and East Panama (Panama Province) and the Province of Colón. This last zone is the jurisdiction of the recently created IDAAN Metropolitana, S.A., a company that provides services to close to 74% of the total inhabitants of the area. IDAAN's privatization committee (*Comisión de Incorporación de la Participación del Sector Privado* or CIPSP) plans to sell at least 51% of IDAAN Metropolitana, S.A., and give thirty-year concessions to the Province of Chiriquí and the Central Provinces.

With the support of the IDB and World Bank, the government of Panama is accomplishing the following with regards to environmental issues:

- (i) Development of the regulatory and institutional framework (final stage).
- (ii) Establishment of a regulatory institution (already functioning).
- (iii) Estimation of environmental liabilities (to be started in 1998) but only limited to water supply and not sewerage.

Wastewater treatment is a complex topic that has no short-term solution and it is not included in the privatization of IDAAN. All rivers which release waters into the Panama Bay and the Bay itself are very polluted with raw industrial and domestic waste.

The government, through the Ministry of Public Works (*Ministerio de Obras Públicas* or MOP) awarded two road concessions both as BOTs (build, operate and transfer). The first one (Corredor Norte) has an Environmental Improvement Programs or PAMA (Programa de Adecuación Ambiental) which includes an EIA. The second one, the Corredor Sur, has its PAMA still in the process of being approved.

After the Corredor Norte concession several public roads have been constructed and environmental impact studies have been performed. It is important to note that the MOP only performs control and monitoring and INRENARE is the only one with enforcement authority.

In August of 1996, the Ports of Colón and Balboa were privatized. INRENARE has already approved its PAMA for Colón and has requested its execution for Balboa. In addition, the freight railroad from Panama to Colón has been concessioned but no PAMA/EIA development information was available.

Airports have not been privatized yet. The Tócumén International Airport (Panama City) is planned to be concessioned in 1998.

Table 4.5. Environmental Issues in the Privatization of Public Services in Panama.

Service	Coverage Level (Year of Privatization)	Environmental Liabilities Assessment	Environmental Impact Assessment	Environmental Monitoring, Auditing and Enforcement
Water and Sanitation ^a	Panama City and suburbs (near future)	being developed	N/A	not performed ^b
Energy ^a	national (near future)	being developed	N/A	preliminary ^c
Ports	Ports of Colón and Balboa (1997)	N/A	being developed ^d	N/A
Airports ^a	national (future)	N/A	being developed	N/A
Roads	Corredor Norte and Sur routes (mid 1990s)	N/A	basic	basic

^a As of December, 1997, no facilities have been privatized.

^b Some water supply quality is monitored by several government agencies.

^c IRHE and INRENARE perform audits and environmental enforcement.

^d EIA and PAMA for the Port of Colón is already completed, while still pending for the Port of Balboa.

4.6. Peru.

Since 1991, Peru has been quite active privatizing public corporations starting with the electric, air transportation, telecommunications, mining and oil sectors. The privatization was carried out by the Committee to Promote Private Investment (*Comisión de Promoción de la Inversión Privada* or COPRI) and by *ad-hoc* committees. COPRI's operations before April of 1997 amounted to a total of over US\$ 7 billion with investment commitments of an additional US\$ 7 billion. The Private Concessions Promotion Commission (*Comisión de Promoción de Concesiones Privadas*) has the authority to determine which public works or services will be privatized.

Peru's Environmental and Natural Resources *Code (Código de Medio Ambiente y Recursos Naturales)* includes general policy issues and indicates the premises of sustainable development. It adopts the "who pollutes, pays" principle and provides general guidelines about environmental planning, education, public participation, safety, control, evaluation and enforcement. It gives the authority to sectoral institutions to decide whether or not to comply with EIAs. Peru has produced a considerable number of privatization and private participation laws. However, environmental issues (liabilities, EIAs, institutional arrangements, etc.) are, at best, superficially mentioned. Environmental concerns arose mostly during the privatization process of large enterprises in which foreign firms (mostly with strong environmental policies) were interested in acquiring.

Environmental management responsibilities are widespread in the government's executive branch. Most ministries and autonomous agencies have environmental units but there is widespread difference –with regards to their goals, regulations and enforcement- among them. In December of 1994, a coordination and policy consolidation institution called the National Environmental Council (*Consejo Nacional del Ambiente* or CONAM) was created (CONAM, 1997). CONAM is still a young organization and will require time and effort to fulfill its goals.

The energy and mining sector, which is managed by the Ministry of Energy and Mining (*Ministerio de Energía y Minas* or MEM), is one of the most active in environmental affairs. Peru has an installed electric power close to 4700 MW (as of mid-1996), of which 54% comes from hydropower and the remaining from thermal sources. Since 1994 around 10 power companies were privatized. The MEM gives generation, transmission and distribution concessions and the Commission of Electric Rates (*Comisión de Tarifas Eléctricas*) sets the electricity rates and regulation enforcement (including quality of service, safety, technical requirements, etc.) is performed by the newly created Energy Investment Supervisor Bureau (*Oficina de Supervisión de Inversiones en Energía* or OSINERG). OSINERG is in charge of environmental enforcement, but this has not been implemented as of yet and is, for the time being, performed by the Oil, Mining or Electricity Directorates (all belonging to the MEM). EIAs are required for obtaining construction licenses of new power plants (mostly private) from the General Electricity Directorate (*Dirección General de Electricidad*) of the MEM.

Peru is a country with vast oil and gas reserves. For decades, oil exploration, exploitation, processing, transportation and distribution have been managed by government-owned conglomerate PetroPeru. In late 1980s and especially in the beginning of the 1990s, private investments were allowed specially in oil exploration. Before privatizing oil companies, all Environmental Improvement Programs (*Programas de Adecuación Ambiental* or PAMA) were completed and approved by the MEM's *Dirección de Hidrocarburos* (Hydrocarbons Directorate).

PetroPeru has an Environmental Protection Unit (*Unidad de Protección Ambiental*) but all companies belonging to the holding have one as well. PetroPeru has a defined environmental policy and follows oil

environmental standards, which are similar to ISO 14000¹⁴. The MEM and the Port Authorities (Capitanías de Puerto) are responsible for oil management environmental enforcement.

Peru has also large and unused natural gas reserves. The environmental measures taken for the future development of the Camisea Project deserve a brief discussion even though no privatization scheme is involved. The Shell Prospecting and Development Company is in the process of completing the studies for developing the largest natural gas reserve in South America. Shell has hired top environmental firms to conduct an EIA and mitigation studies and has an independent environmental non-government organization monitoring the entire effort. Shell has also taken all the necessary preventive measures in the construction of the exploration and transportation infrastructure.

Peru has a large mining potential. For years, the government owned large mines and metallurgical centers but due to an excessive level of environmental liabilities and mismanagement, the privatization of large mining conglomerates failed. A different approach was followed and Preliminary Environmental Evaluation studies (Evaluación Ambiental Preliminar), detailed PAMAs and remediation programs were elaborated for all mining activities. Implementation of well-needed reengineering activities in the mining processes have rendered to substantial reduction of pollution levels and created important savings/income. All PAMAs were approved in 1996 by MEM and the remediation process started. An environmental remediation fund (Fondo de Remediación Ambiental) was created to fulfill the commitments made on the acquisition contracts. For fiscal year 1996 the fund has collected US\$ 30 million (from privatization income) and by the end of 1997 the amount should have doubled.

Other mining complexes like Hierro-Peru a large iron mine and metallurgy, was privatized to a Chinese corporation with very little environmental considerations. Several other mines were also privatized and large Canadian, American and European companies are operating them with careful environmental management. Still, there are more than 55,000 small and medium mines (privately-owned) with little or no environmental programs.

The Ministry of Energy and Mines has a very active environmental unit, called the General Directorate of Environmental Affairs (*Dirección General de Asuntos Ambientales* or DGAA) which reports to the Vice-Ministry of Mines. This unit is in charge of policy development and the production of environmental norms in energy, mining and oil.

All companies to be privatized have to have an approved PAMA. The government has negotiated the remediation plan and most environmental liabilities are to be financed by those companies in explicitly defined sales/concession contracts. The government also signs an Environmental Stability Contract (*Contrato de Estabilidad de Iniciativa Ambiental*) in which the new owner follows all environmental legislation up to the date of contract signing and for a period of time, usually for five years after that.

The Peruvian water and sanitation services are, in general, below any acceptable standard, both in quality and reliability. For instance, in the rural mountain area (the so-called “*sierra rural*”) of every ten poor people, only two have access to potable water, one to electricity and none to sanitation services (Caretas, 1998). In general, most water supply facilities have basic treatment but sanitation infrastructure only collects sewerage and disposes it raw to different water bodies. This has created serious health problems and environmental liabilities. The Superintendence of Sanitary Services (Superintendencia Nacional de Servicios Sanitarios)

¹⁴ Oil pollution has become a major environmental issue in Peru. PetroPeru had to perform clean-up duties for spilling 200 barrels of crude oil nearby the Conchán Refinery in 1995 (Lobato, 1997). The local municipality also fined the company US\$ 250,000.

serves as the national regulatory agency. It was able to comply with some of its regulation duties, but little environmental monitoring and enforcement is performed.

In 1993, Lima's water utility was in the process of being privatized but this operation was halted by the central government, and since then no other privatization initiative prospered. The government has several programs to improve water and sanitation services but still no private participation is expected due to the lack of political will, insufficiency of incentives, incomplete legislation and weak institutional arrangements.

The Ministry of Transportation, Communications, Housing and Construction (Ministerio de Transporte, Comunicaciones, Vivienda y Construcción or MTCVC), through its Special Concessions Committee: National Road Network (Comité Especial de Concesiones: Red Vial Nacional), is in the process of an international bid for awarding concessions of 6,830 km of roads around the nation. There is no information about the elaboration of any environmental studies for those operations.

Peru has 14 main ports managed by the state-owned enterprise Nacional Ports Enterprise (Empresa Nacional de Puertos). Some privatizations are expected in the near future but no further information is available. However, PROMCEPRI is planning to privatize some **airports** to one concessionaire. No information about any pre-privatization environmental studies was found.

Table 4.6. Environmental Issues in the Privatization of Public Services in Peru.

Service	Coverage Level (Year of Privatization)	Environmental Liabilities Assessment	Environmental Impact Assessment	Environmental Monitoring, Auditing and Enforcement
Water and Sanitation^a	national (future)	N/A	preliminary	not performed ^b
Mining	national (1990s)	acceptable	acceptable	basic
Oil and Gas	national (since late 1980s)	acceptable	acceptable	basic
Electricity	national (1990s)	N/A	basic	N/A
Ports and Airports^a	national (near future)	N/A	N/A	N/A
Roads^a	national (near future)	N/A	N/A	N/A

^a As of December 1997, no facilities have been privatized.

^b Some water quality monitoring is performed by government agencies.

5. The Environment and the Privatization of Public Services Issues Discussion.

The environmental evaluation of the privatization of public services in the Region (with results displayed in Chapter 4 and Annex A), have unveiled a list of important topics that deserve discussion and analysis, and will be the base for the conclusions and recommendations of this study (Chapter 6). The following is a distilled discussion of the main issues found (not necessarily listed in order of importance).

5.1. Environmental problems with or without the privatization of public services.

Through decades of operation in the Region, public services enterprises have created a long list of environmental problems with different levels of severity. However, it is important to differentiate between environmental problems that are quasi-independent of the process (which may remain or disappear after privatization is completed—still affecting the privatization outcome) and those which are strictly related to the process itself (and may emerge when privatization occurs). Below are the two different scenarios that clearly separate those two situations:

- a. **Environmental problems that are *quasi* independent of the privatization process itself.** One of the most common situations occur when privatization is the only, or one of the few schemes used for reforming the state, leaving many other components untouched. Therefore, it is expected that for instance, legal and institutional arrangements for environmental matters will continue to act with the many deficiencies and uncertainties as in the past. There is a tendency in the Region to modernize and provide resources to the economic drivers of the process (regulatory agencies, for example) leaving the environmental issues aside.

It was also found that many negative externalities caused in the past by state-owned enterprises do not have a “landlord” when they are privatized. The new owners are not responsible for an environmental liability which they have not caused, and then the government assumes responsibility but considering it a “sunk cost”. This is the case, for example, of improperly disposed hazardous waste, which does not have a mitigation plan after the privatization of the public enterprises.

- b. **Environmental problems closely related to the process.** In the vast majority of privatized enterprises, the new private owners inject considerable amounts of capital due to contractual obligations and/or well needed investment in order to make the enterprise profitable. It is almost certain that the firm is not only going through just a “facelift” and radical changes are indeed being made. This process generally results in infrastructure modifications/additions, and changes in the production cycle, which accounts for larger outputs in a more efficient manner. All of these, in some way or another, affect the environment. For example, the privatization of urban trains in Buenos Aires, Argentina has increased its efficiency, service and its frequency. However, due to the fact that the city does not have the necessary infrastructure to accommodate the higher influx of trains, this has caused negative impacts on the air quality of the city due to congestion, and has caused a shift to other means of urban transportation.

5.2. Legislation.

Legislation plays a very important role in the privatization of public services. It was found that a massive amount of law has been developed in the Region. However, from all aspects to be considered, the environmental norms/regulations are still below desired levels. Quite often privatization and private participation laws refer to other environmental laws to fulfill a specific goal or assign a level of authority. In addition, it is not unusual to find environmental laws that have gaps or excesses that complicate the process and generate confusion, which is not always beneficial to the environment. In Panama, for example,

privatization legislation constantly refers to environmental laws and authorities. However, there is no environmental code approved yet and the regulatory agency has the mandate to generate it when needed. The environmental authority (INRENARE), in the absence of approved regulations, uses the latest version of the draft bill, creating an ineffective circle that should be avoided.

In some other cases, countries have abundant environmental framework laws, but this is not the case when it comes to their regulations. This is the case of regulations in Argentina, for example. It is worth mentioning that advanced private participation water and environmental framework laws for Chile and Bolivia were developed at the beginning of the 19th century. In Chile, this law was implemented decades later when the regulations were made available. However in Bolivia, it was never implemented because neither regulations nor government institutions were created.

Several corporations, after negotiating environmental issues with the governments, are asking them for a “regulatory freeze” on future legislation. They want the government to guarantee the current “set of rules” for a determined period of time. This is the case of large mining firms who acquired mining complexes in Peru where large liabilities exist. They negotiated remediation programs and pollution levels based on current legislation and do not want additional legislation to interfere with their plans in the years to come.

5.3. Institutional arrangements.

Environmental institutions are vital during pre and post privatization of public utilities. Many institutions have been created for the transfer and regulation of the newly privatized organizations. However, the persistent lack of resources has made it difficult to create or update environmental organizations in order to regulate the management activities of the private sector controlling public services. This is the case, for example, of the Federal Environmental Attorney General (PROFEPA) and the Institute of Ecology (INE) in Mexico. The first is in charge of environmental monitoring and enforcement; the latter issues environmental licenses. Workload (especially of INE) has increased tremendously and the available resources are being stretched to the maximum to fulfill their mission.

It was found that some public services (to be privatized) are managed by large monopolies that are also involved in environmental management. When privatization occurs, it is very likely that their environmental units will be disassembled. The authorities need to find a way to recapture their experienced staff and continue to utilize their services. This is the case of IRHE in Panama, which not only operates the electric power system but also is also involved in watershed conservation and environmental management. After the privatization of the electric sector, IRHE and its environmental unit will disappear or be reduced to a minimum. The government is studying means for effectively relocating their staff and maintain the benefits of their environmental units.

5.4. Policy and political will.

In the last decade, the Region relied heavily on privatization as a tool for state modernization and efficiency improvement. During pre and post privatization of public utilities, it is expected that the highest level of government (national, regional and local) be actively involved and have well-defined policies in order to provide a basis for sound legislation and effective institutional arrangements. It was found that governments have been very active in creating diverse sets of frameworks but do not necessarily have the political will for fully integrating environmental protection/conservation issues. In some other times the excess of policies and their ramifications have resulted in repetitive and ineffective frameworks. This is the case in countries like Peru and Chile in which each sector is almost independent from the other and not effectively coordinated as a whole, even though most environmental issues of all sectors are interrelated.

5.5. Regulation.

Regulation of public services is needed when monopolistic behavior exists after the privatization of the enterprise. In order to maximize social benefits (or minimize deadweight loss), the government intervenes in the price of the services offered. Considering that many public services are monopolies (independent of whether or not they are managed by the private or public sector), governments in the Region have created regulatory agencies that, in some cases, not only deal with economic allocative efficiency issues but also award licenses and enforce environmental contractual agreements and laws. This is the case of ENRE, the federal electric regulatory agency in Argentina, which performs, quite efficiently, those duties with the assistance of consultants and contractors. However, this may not be the best arrangement for other sectors and nations. Regulators have well defined regulatory duties and are not expected to be environmental specialists. Environmental matters in the regulation of privatized services should be assigned to appropriate environmental agencies who have the expertise and are supposed to be independent and accountable of their actions.

Chilean regulators, who have been in place for years, claim that it is necessary to create one coordinating regulatory institution for environmental matters while conserving the autonomy of each regulatory agency within it. Its purpose would be to analyze transboundary and interdisciplinary environmental impacts during the privatization of public enterprises and to respond, if needed, as a government apparatus as a whole. This seems to create a good scenario for environmental commissions (called CONAMAs or CONAMs in the Region) whose main role is to coordinate these activities.

Regulatory agencies are very sensitive to conflict of interests. The Peruvian government created separate enforcement agency from the electric regulators. The reason? The regulatory commission is comprised mainly of the private energy providers and a separate agency is needed to eliminate possible vested interests. This newly created organization will be in charge of environmental enforcement in coordination with other authorities.

5.6. Standards.

Most privatization contractual agreements refer to a determined set of environmental standards. Several countries like Argentina, Chile and Mexico have done considerable progress and have quite acceptable ones. Other nations like Bolivia and Panama do not have a complete set of standards for all public services. In the case of the latter, it is common to see a contract referring to United Nations organizations (i.e. UNEP, UNDP, FAO, etc.) or World Bank standards. However, effective compliance and enforcement of any standards revolve around not necessarily the current or the ideal ones, but the achievable ones. Obviously, achievable standards are determined through a thoughtful process in which the real present and future attainable capabilities of a nation are evaluated. Appropriate standard levels guarantee a better compliance according to the reality of each country or region.

Several large multinational enterprises acquiring public services in the Region are conscious of the need to follow the standards from their own first-world countries. This is the case of firms such as Shell and Mobil, and some Canadian mining corporations (with ventures in South America), whose standards in the Region equal or surpass energy and mining environmental protection standards found in their own nations.

5.7. Monitoring, auditing and enforcement.

Environmental monitoring, auditing and enforcement is, without a doubt, the weakest link of environmental management in the Region. Most countries either do not perform it or do it at less than acceptable levels, in spite of it being one of the most important issues in the privatization of public services. Several experiences of auto and voluntary monitoring and self-reporting have been implemented (in Mexico and in El Salvador, for example) but formal and mandatory programs have yet to be implemented in order to validate improvements.

Monitoring should be performed in such a way that it avoids potential conflicts of interests. For instance, the Aguas del Illimani contract for the cities of la Paz and El Alto in Bolivia allows the concessionaire to hire an independent firm to do water quality monitoring. Even though this may result on good monitoring it may also raise some conflicts of interest in the future. Also, keeping all data appropriately stored and making it available to all stakeholders increases the transparency and seriousness of all activities.

It is crucial to have an independent enforcement apparatus (i.e. independent attorney general) that follows independent and transparent environmental standards. However, it is very important to separate the environmental normative/regulatory duties from the enforcement roles. In several nations, government institutions have all of those responsibilities fall on one authority, which may create constant conflicts of interest. An interesting scheme that deserves discussion is with the federal government in Mexico. Environmental normative institutions (i.e. INE) are independent of PROFEPA, the enforcement agency. PROFEPA's achievements are quite admirable even though its lack of resources impedes more noticeable improvements.

5.8. Environmental liabilities.

Environmental liabilities are a burden to governments, the owners/concessionaires of the privatized firm, and society in general. The magnitude of the problem is considerable throughout the region since many governments have flagrantly ignored environmental concerns in a haste to proceed with privatization of state owned enterprises (especially during the 1980s).. Even though precise information on the extent of the problem is scarce, it is known to be widespread including large public services enterprises. Environmental liabilities need to be identified and evaluated, and a realistic and achievable remediation program must be found and implemented.

Centromin-Peru, one of the largest mining conglomerates in the Region, was unable to get a single bidder for rich mining complexes due to the large amounts of environmental liabilities. A well-thought mitigation and remediation plan brought back the investors and may become a model of not only successful privatization approaches under heavy environmental liabilities, but also demonstrate how cleaning the environment can represent good economic benefits to the firm (Centromin-Peru has largely profited from reengineering their processes and avoiding severe environmental hazards).

It is very difficult to determine who created current environmental liabilities (some of them dating back decades). In the privatization process it is more productive to determine who is responsible for the remediation plan (the "able to pay, able to implement" principle). The Mexican government has taken an interesting approach while privatizing the railroad system. They communicated to the new concessionaires that they (the government) would be responsible of any environmental liabilities. They identified and evaluated all liabilities in warehouses and shops and are in the process remediating them. However, thousands of kilometers of railways were not evaluated and any environmental liabilities found in the future

will be the exclusive responsibility of the government, who is obligated to remediate them according to contractual commitments.

The commitment made by governments that they will clean up environmental stocks (as agreed in many privatization activities in the Region) is not a true guarantee of appropriately handling those hazards. If the governments are in charge of handling environmental liabilities, it should be expressed in contractual terms and reflected in a remediation plan to follow. This is the case of oil enterprises in Peru in which liabilities were identified by an independent party, and the government formally agreed to absorb all liabilities and committed to mitigate them in a well defined plan called PAMA.

Most recently, privatization has taken into account environmental liabilities. But privatizations done in the 1980s, when the environmental issues did not have the priority that they now have, were done with no studies at all and were considered “sunk costs”. This is the case of some ports in Argentina and electric utilities in Chile. This situation has to be avoided.

5.9. Environmental impact studies.

Most public service enterprises are transferred to the private sector in precarious conditions. In order to become more efficient organizations, they go through a process of restructuring and often significant physical changes are made. This may affect the surrounding environment and an environmental impact study is usually needed to determine its true effects and mitigation measures.

Impact studies and assessments should be regulated appropriately and the law should indicate the scope, level and process to follow for each circumstance, as is the case in Mexico. In the case of the mining and energy sector in Peru, widespread disclosure and discussion of findings is mandatory in a public meeting. The reported results have been impressive and the new owners/concessionaires and community felt that the process helped both to understand the new challenges and opportunities.

External consultants perform most environmental impact studies. In several countries, the authorities have a dedicated database of internal and external accredited contractors. This has been quite useful, especially in nations with weak environmental assessment legislation.

5.10. Public awareness, involvement and participation.

In some countries, the law requires public involvement and participation in the environmental decision-making process for newly privatized enterprises. This is the case of the mining sector in Peru and water supply and sanitation for the province of Mendoza in Argentina. As mentioned before, the results have been quite favorable. However, there should also be participation of certain key mechanisms to appropriately include all inputs in the process. This involvement of the public in conjunction with a regulatory entity is seen in the United States, where federal environmental regulations (through the US Army Corps of Engineers ENEPA program) and all parties involved in the process have to discuss environmental impacts and decide the level of mitigation actions. The process has proven to be successful and considerable enhancements to the environment have been made.

The Region has not made serious advances in making public all environmental data collected. An important initiative is given by the Peruvian Ministry of Energy which has a comprehensive Webpage (www.mem.gob.pe) with information about law, studies, permits and the latest news on energy (electricity, hydrocarbons and mining) environmental matters. Transparency has increased public participation and the government agencies have gained not only visibility but also respect with all stakeholders.

5.11. Financing, investment and incentives for environmental enhancement.

Post-privatization environmental conservation and enhancement produces known benefits but carry some costs as well. For instance, the Mexican Secretary of Communications and Transportation estimates that following environmental guidelines during road construction increases the total costs by approximately 5%. This may not seem much, but ample environmental liabilities (both in stock and flow) could represent considerable expenses that would change the whole privatization process. For instance, for the mining complexes in Peru, the government created a special remediation trust fund that is expected to surpass US\$ 60 million by the end of 1997.

As with any other cost, the environmental costs infringed should be reflected in the public services tariffs. However, from all public services offered, wastewater treatment has, in general, high environmental costs by the Region's standards. Several communities in Mexico have experienced very high water fee hikes due to the treatment of sewerage. Putting aside the polemic construction of plants built as BOTs and BOOs in that country, clean residual waters enhance the health of the environment tremendously but at elevated monetary costs. This information was corroborated with data collected at a treatment plant model in Santiago, Chile. So, how far should we go for environmental enhancement? There is no easy answer to this question. It seems that there has to be a compromise between the planned goals, and the cost recovery and financial assets available. An important lesson could be learned from wastewater treatment plants for small and isolated communities in the US. Their lack of financial resources (like many cities in the Region) made them exploit the creativity of both the private and public sector to develop unconventional treatment facilities with excellent environmental protection results¹⁵.

The private sector is also interested in financing environmental enhancement activities in the privatization process. However, interested banks like Banamex in Mexico were not successful in financing those operations mainly due to: (i) low tariffs which make the projects financially unfeasible, and (ii) excessive politicization of public services by local and national authorities.

5.12. Privatization contracts.

The contract is the most important document in the privatization process. In it, all the issues are expressed, as well as the obligations and responsibilities of the parties. Contracts should closely comply with the law and, in its absence, contingency mechanisms should be in place for clarifications and/or disputes (in which case stating a third party is quite common to resolve the conflict).

It has been found that privatization contract development is a lengthy process that starts at procurement. Several negotiations are carried out and finally the parties agree on a master document. In the Region it is common to see transitory clauses ("*disposiciones transitorias*") at the end of the document that are valid for a certain time, space and conditions.

Contracts are dynamic documents. They are modified due to changes in the conditions and the surrounding environment with agreement of all parties involved. Renegotiations of contract details are also specified in the document but they take some time to be accomplished. For instance, the Aguas Argentinas concession

¹⁵ For more information, refer to the US Environmental Protection Agency document entitled Constructed Wetlands for Wastewater Treatment and Wildlife Habitat (EPA, 1993) and Uncertainties in Design and Implementation of Constructed Wetlands (Floris, 1995).

contract with the Argentinean government is set to be renegotiated every five years. However, contingencies and unexpected circumstances forced the parties to do it in a shorter period¹⁶.

Because in some sectors privatization is performed in different stages, contracts should be flexible enough to guarantee that transition. This is common in water/sanitation privatization in which some management contracts or infrastructure operation schemes are initially considered and later converted into concessions, BOTs or sales.

Environmental issues are also part of contracts. In it, all matters related to environmental liabilities, assessments, monitoring, auditing, enforcement, among others should be included. Transitory clauses are used to define the details of mitigation and/or rehabilitation activities (schedules, goals, and responsibilities).

We can conclude that the type of contract affects environmental outcomes and vice-versa.

¹⁶ By the end of 1997, the contract was in its second renegotiation since its approval in 1993.

6. Conclusions and Recommendations.

The transfer of public services enterprises to the private sector domain raises the issue of responsibility for environmental impacts from past, ongoing and future operations as well as more comprehensive concerns of environmental management.

6.1. Environmental issues directly related to the privatization of public enterprises.

6.1.1. Environmental liabilities.

What environmental liabilities arise when public service enterprises are privatized? How large is the problem? How can proper site rehabilitation be ensured? What provisions should be required to ensure effective remediation? How do industry, governments and multinational financial institutions propose to resolve liability arising from past operations and from present and future activities? All of these questions refer to one of the main problems in the privatization of public services: environmental liabilities of past operations.

As was found in this study, several public services enterprises in the Region had mismanaged their production and waste handling practices causing either serious environmental impacts and/or left behind significant environmental risks for the near future. Those environmental pre-existing problems have created pollution stocks which incite the parties in the privatization process (government and private investors) to clean up contaminated sites, mitigate, contain or abate damages, and/or compensate or provide medical assistance to victims.

For properly relieving or eliminating pre-existing pollution stocks, the parties involved in the privatization scheme should determine who is responsible for known or contingent damages to public health and the environment, and they should either resolve them or offer concrete mitigation plans before the privatization process can be fully implemented. The experience in the Region shows that responsibilities were assumed mostly either by the previous owner (the government), or has been shared between the state and the new private firm. In cases in which the previous owner was responsible for damages, some governments (especially in the 1980s) assumed all responsibilities (in order to speed up the privatization process), but few were in a position to finance the rehabilitation from their normal funding sources at the end did nothing or very little to alleviate the environmental liability. The assumption of such responsibility by a government does not necessarily mean that a solution will be carried out. Recently, states have shown more trustworthiness and have followed up in their commitments. However, in cases where the state and the new private investors shared the responsibility, both were contractually committed to a mitigation plan and, in the majority of cases, the results were as expected. To avoid any negative outputs, the parties should explicitly define, in contractual terms, the responsibilities and all the details for the mitigation plan (schedule, goals, who is in charge of what, resources needed, technologies, and contingencies, among others).

6.1.2. Pollution flows, regulatory freezes and unsustainable use of resources.

Ongoing operations of the privatized enterprise may also be a source of significant pollution flows. Some observed impacts are:

- a. Governments tend to freeze up regulatory standards, regulations and enforcement (which are already, in several countries of the Region, incomplete and outdated) in order to either “attract” new investors or to merely comply with the new owner’s contractual agreement. Even though regulatory freezes started in

the privatization of the mining sector, it has been slowly spreading to the energy and water/sanitation sector. They can be found in several privatization contracts but in a “implicit” manner. For example, contractual clauses may indicate that the concessionaire needs five years or so to study an environmental problem requiring all legislation to be frozen during that time.

Knowing the consequences of regulatory freezes, governments may be forced to develop, update or reinforce regulatory policies, laws and regulations and to strengthen institutional arrangements. Again, important measures taken in the mining sector could be adopted to the privatization of public services.

- b. Newly privatized firms are generally pushed by competition or by investment recovery schemes to maximize profits and, in the absence of law and regulations, they may be unwilling to incur the additional costs of reducing pollution or be inclined to use up natural resources in an accelerated unsustainable manner. However, due to the still recent privatization of public services in the Region, it is still too early to conclude that this is happening.

It has been shown that environmental management is becoming an issue for the private sector, not necessarily motivated by a higher level of environmental consciousness, but due to the significant potential savings and earnings of satisfactory environmental management. In order to increase efficiency, several privatized firms in the Region have adopted a more rational approach in the use of natural resources and pollution prevention, and adopted cleaner technologies and production policies. It has been observed that in several utilities privatization cases in the Region, measures were discussed and agreed upon during the negotiations process.

- c. The privatization process may recapitalize and revive polluting firms that would otherwise go out of business. This is quite common with some power generation thermoelectric plants. The result may be intensified pollution and a heavier regulatory burden for environmental management organizations.

6.2. Broader environmental issues and the privatization of public enterprises.

The State’s broader environmental issues, which are not a consequence of the privatization itself, affect the private participation process and the environment in many ways. It was found that those issues are mainly related to policy, legal and institutional arrangements during pre-existing, ongoing, and future conditions.

Issues that affect pre-existing conditions are:

- a. Liability. Considering that in several nations of the Region legislation and regulations are lacking, incomplete or ambiguous, who is responsible and liable for past damages caused by environmental liabilities?¹⁷
- b. Effectiveness. Assuming that the regulation clearly states responsibilities, what is the degree of effectiveness of public agencies in terms of cleanup and other measures to mitigate liabilities and contain or compensate for damages?
- c. Monitoring, auditing and enforcement. Will the present institutional arrangements ensure a proper follow up for monitoring, auditing and enforcement?

¹⁷ Note that in the past, a public enterprise could have been managed by a private firm (or other) causing different levels of environmental liabilities. It is up to the local authorities to determine who is liable for the pollution stocks created.

- d. Institutional arrangements. What is the capacity of the administrative and judicial systems for implementing legislation/regulations on liabilities?

Issues that affect on-going and future operations are:

- a. Strengthening of environmental institutions. Policy, legal and regulatory mechanisms are effective only if there are organizations capable of implementing and enforcing them. It has been found that most agencies are not strong enough to ensure sound environmental performance of privatized firms. They lack the human capital and resources to respond with effectiveness to the new demanding conditions.
- b. Disclosure of information and public participation. Privatization of public services is not only meant to increase efficiency, but to give the opportunity to the private sector to better use resources and provide better services, and also to increase the participation of all stakeholders. For that, it is important to have transparent processes in which environmental information is available. It is the local public's right to know about the environment and health issues affecting them.

6.3. General environmental guidelines for the privatization of public services.

This study has concluded that most public service enterprises in the Region, and the organizational cultures and realities in which they are immersed are so diverse, that it is very difficult (if not impossible) to come up with "cookbook" guidelines on how to guarantee environmental sustainability in all privatization cases. The depth of this study has made it possible to distill some very general environmental guidelines for projects related to the privatization of public services enterprises. However, by no means are these suggestions to be considered best practices.

The following general guidelines were developed based on the stages of the project cycle: project preparation, implementation and (post) completion.

6.3.1. General guidelines during project preparation.

Listing of environmental recommendations (not necessarily in any specific order) for project/team leaders of multinational financial institutions during project preparation in the privatization of public services enterprises:

- Collection and analysis of information and baseline data of the public services enterprise and its history of environmental management.
- Review of environmental policy, legal and regulatory matters, including obligations of international agreements on environment and natural resources.
- Determination of existing institutional arrangements (including administrative and judicial).
- Perform a preliminary liability audit that involves collection of information by interviews, studies of available historical data and by visual inspections of contaminated sites.
- Determine if the preliminary liability audit is sufficient or if a more comprehensive one is needed.
- Perform, if needed, a full liability audit that involves detailed physical sampling and testing of contaminants in laboratories.

- Develop a mitigation plan that includes:
- The development of a prioritized list of all environmental, health and safety pollution stocks and risks, and damages related to past and on-going activities.
- Determination of goals and the degree of “cleanliness” required (the “how clean is clean” principle).
- Define benchmarks and indicators for monitoring and evaluating the mitigation performance.
- Provide recommendations, alternatives, costs, responsibilities and schedules on required mitigation and/or compensation measures.
- Active participation in the negotiation process when environmental issues are discussed. It is recommended to have the consulting team of experts or staff members who were involved in the phases mentioned above available during this critical step.
- Include in the privatization contract main details of the mitigation plan, standards that will be followed, environmental monitoring, self-monitoring, auditing and enforcement, and clauses that determine mechanisms in case of environmentally related disputes.
- Determine the degree of compliance with standards and the legislation capabilities of: (i) the environmental monitoring and auditing authorities (external) and, (ii) the internal monitoring and auditing units (within the public service enterprise). Monitoring and auditing should not only be directed towards measuring and evaluating environmental changes, but also assessing the effectiveness of agreed mitigation measures. If the monitoring and auditing system does not have a high level of competence, it is imperative to seek means for developing or strengthening it.
- Determine the degree of effectiveness of the environmental enforcement authorities, including their administrative, legal and judiciary capacities and mechanisms. If the enforcement system is non-existent or is unable to ensure appropriate implementation, it is essential to create or strengthen an organization that assures compliance of law and regulations. In addition, it is important to have a provision for conflict resolution and provision for appeals in place. It is suggested that an environmental ombudsman be available for hearing public concerns (as is customary in some countries in the Region), and bring them to the attention of the authorities.
- Determine ways of increasing transparency on environmental actions by information disclosure and dissemination. Also, due to the nature of public services enterprises, the privatization process is not only comprised of the government (seller) and the private industry (buyer), but the community (clients) and authorities as well. Therefore, it is crucial to seek public participation during pre-privatization (*ex-ante*) and oversee post-privatization (*ex-post*) initiatives. It is important that environmental authorities implement a program in which public consultation is properly sought and all stakeholders participate in the decision-making process.
- Determine the level of environmental impact of possible government “regulatory freezes” during the privatization process. This study should include an analysis of environmental liabilities management and an evaluation of short and long term externalities. This may encourage governments to develop, update or reinforce regulatory policies, laws and regulations, and to strengthen institutional arrangements.

6.3.2. General guidelines during project implementation and (post) completion.

Effective project implementation has its bases in well thought project preparation. Multinational financial institutions have the responsibility of carefully overseeing implementation activities (defined in contractual agreements) to be accomplished at this stage. Below are some general guidelines during project implementation in the privatization of public services in the Region:

- Execute an on-going evaluation that: (i) monitors contractual progress, (ii) compares new data with original baselines and agreed benchmarks, and (iii) measures progress toward meeting objectives. A fair evaluation should ensure stakeholders that it is: impartial, credible, useful, participatory, able to provide feedback and be cost-beneficial (IDB/EVO, 1997).
- Based on the results attained and the factors that helped or hindered this achievement, it may be needed to introduce and negotiate goal and activity modifications.
- Provide assistance (if needed) to environmental regulatory institutions and authorities in order to assure environmental compliance. This support may be given in:
 - a. The implementation of monitoring, auditing and enforcement mechanisms. As explained before, this is without a doubt, the weakest link in environmental management in the Region, though efforts from isolated countries should be recognized. This plays an essential and critical role with public services enterprises¹⁸.
 - b. Finding enduring funding mechanisms that assure the financial sustainability of environmental management institutions. Most of these organizations in the Region have been created but most often lack the financial support to fulfill their mission. It is important that multinational financial institutions as well as governments and community in general seek means to achieve appropriate funding to fulfill their mission.

6.4. Some general environment-related recommendations to multinational finance institutions in the privatization of public services in the Region.

The privatization of public enterprises is a complex duty. The inter-disciplinary magnitude of the issues addressed and the needs and interests of different stakeholders involved (environment included) increases its complexity but also gives the opportunity of gaining synergetic benefits. Multinational financial institutions are more and more involved in this process. Based on what was observed in the field, below is a short listing of general suggestions to those institutions:

- a. **Improve monitoring, auditing and enforcement mechanisms and institutions.** A key element that has a vast room for improvement in the Region.
- b. **Promote technical competence and financial sustainability of regulatory agencies.**
- c. **Increase participation of the public in matters of privatization by means of education and environmental awareness programs.**

¹⁸ This is due to the fact that public services enterprises mostly remain as natural monopolies (after privatization) and its operations are usually concessioned (if not sold) for longer periods of time (usually 25 or 30 years).

- d. **Develop an environmental source-book for privatization of public services.** The different environmental units at the multinational financial institutions have spent considerable effort in developing different kinds of environmental guidelines. However, due to the nature of public services privatization it would be quite useful to prepare *ad hoc* documentation of successful ventures (i.e. environmentally sustainable) that would be available not only to their staff but also to borrowing member countries and the public in general. This document may include examples, case studies and sample text for pertinent documents (i.e. contracts).
- e. **Environmental database of privatization enterprises.** Privatization is still a new tool for state modernization even though it is used massively in the Region. Due to the nature of its environmental consequences, it is recommended that tracks be kept of its successes and caveats and make them available through electronic means. This should also include a list of technical consulting professionals with experience in the preparation of environmental studies for the privatization of public enterprises.
- f. **Support internal educational initiatives related to environmental management and the privatization of public services.**

This study found out that multinational financial institutions' staff have gained a substantial level of awareness related to environmental issues and privatization of public utilities. However, there is still room for improvement with field personnel (mainly in country offices), specially the ones who are not in the environmental field *per se* but in others like energy, water/sanitation and transportation which are very much related to environmental problems.

6.5. Has privatization improved the environmental quality in the Region?

There is no doubt that, due to the massive privatization efforts, the social, economical, political and environmental situations have changed in the Region¹⁹. Most changes are profound and some look irreversible. Has this changed environmental conditions for the better? At his time there is inadequate evidence to determine the precise effects, and distilling final conclusions would be premature.

It is no secret that environmental issues now have a place in the privatization of public services in the Region. It has been found that privatization is driven from within the government whereas environmental protection and conservation is the result of the outside pressure exerted on governments by civil society and by multilateral financial institutions. However, it is also known that considerable progress has to be made and that there is the willingness to promote environmentally responsible projects.

It is apparent that privatization of public enterprises done in the 1980s lacked the environmental component. However, there have been noticeable improvements in the current decade. With the exception of some isolated cases, all ventures considered environment management issues in some way or another. In some instances, it was superficial and vague, with provisions taking only a few lines of the voluminous contracts. In others, the environment took a more predominant role.

¹⁹ As an example, in Peru, due to the privatization of 142 public enterprises between 1991 and 1997, 109,000 employees were laid off. Only 31,000 were rehired by the newly privatized enterprises (mainly those with higher level of training and younger than 50 years old). This caused an increase in the official unemployment rate (not counting the informal sector) from 2.5% before privatization to 7% after such process (El Comercio, 1998). In contrast, according to a World Bank study in Argentina (IDB, 1997), the outcome of electricity, gas, water and sanitation, and telecommunications enterprise privatization could not be blamed for the significant increase in unemployment observed since 1993, and showed that effective regulation only leads to a small drop in unemployment. The jobless rate in Argentina in May of 1997 was 17.2% (Friedland, 1997).

We can conclude that private investors are, for their own sake, concerned about liabilities, including environmental ones, and demand serious actions to fix pollution stocks. In other cases, multinational companies are concerned with environmental conditions because their corporation's policies mandate that they have to pay attention to these issues. This is their way of making amends for past polemic activities that have had a negative impact on their good name. However, it is impossible to generalize, and not all multinationals are the same.

There is no doubt that multinational development banking organizations have played an important role in fomenting environmental consciousness in the Region by showing its borrowers the profits of sustainable development. With continued efforts, the privatization of public services in Latin America will prove to be a golden opportunity in which all parties, sellers, buyers and the public in general, benefit immensely in the short term and for generations to come.

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8. Annexes.

Annex A. Environmental Issues and Privatization of Public Services Field Data.

Annex B. Key People Interviewed and Contacts.

ANNEX A

ENVIRONMENTAL ISSUES AND PRIVATIZATION OF PUBLIC SERVICES FIELD DATA

Annex A contains all field data related to environmental issues and privatization of public services collected during September 1997 to January 1998. It is organized in six sections, each one corresponding to one of the countries studied (Argentina, Bolivia, Chile, Mexico, Panama and Peru). Each section contains:

- a. A **general background** description of institutional and legal arrangements related to environmental and privatization issues.
- b. **Privatization activities by sectors.** These include available data for the energy, transportation (ports, airports and roads) and water and sanitation sectors. Mining was considered only for Chile and Peru.

1. ARGENTINA.

1.1. General background.

The National Constitution of 1994, for the first time in Argentina's history, incorporated environmental considerations into its text and relates individual rights and duties to those of the state and federal system. Constitutions of the provinces of Buenos Aires and Córdoba include detailed provisions for environmental protection management. Constitutions of the Provinces of Mendoza and Neuquén have not been recently amended, but include restrictions related to natural resources scarcity (Inter-American Development Bank, 1996).

Federal and provincial legislation has been handled within each regulated sector dealing with air, water, soil and wilderness protection. At federal level there is no general EIA procedure applicable to all major projects. However, special sectors, such as energy and mining have progressed in this area. For instance, the energy sector (hydropower, thermal plants, gas and oil exploration and exploitation), does indicate specific procedures for assessing the environmental impacts of existing and planned projects.

As a result of the federal system, environmental responsibilities are divided into three levels: national, provincial and municipal. At the national level the environmental authority is the Natural Resources and Sustainable Development Secretariat (*Secretaría de Recursos Naturales y Desarrollo Sustentable*) which was created in 1992²⁰. This agency has a ministry level position in the executive branch. The Secretariat is in the process, as mandated by the new constitution, to develop legislation called "presupuestos mínimos" (minimum "requirements"). The purpose of this is to generate federal legislation to rule environmental issues at the federal level. Included in this effort are the following laws: environmental impacts, water resources, air quality, environmental ordering, hazardous material, public participation, etc. All these laws will be considered as the minimum standards and regulations for all provinces, but have yet to be adopted by them.

The Secretariat is in charge of monitoring and enforcing the law at the federal level, however, several professionals and institutions question its efficacy. Provincial authorities do act at their respective jurisdictions but there are notorious differences between the existing provinces. In addition, many

²⁰ A similar agency was created in 1973 but was abolished for subsequent military regimes.

environmental concerns and administrative responsibilities are present in numerous government offices, agencies, and institutions from the municipal level up²¹.

The Nation's Auditing Institution (*Auditoría de la Nación*) checks environmental compliance of public agencies and their concessionaires. However, it does not have the power to correct (or penalize violations) and can only recommend corrections.

1.2. Energy.

Argentina has a well-developed electric power sector as shown in Table 1.1.

Table 1.1. Installed Power in Argentina as of December 1996 (Chenlo, 1997).

TURBINE TYPE	INSTALLED POWER (MW)	% OF TOTAL
Steam	4783	28
Gas	2943	17
Nuclear	1005	6
Hydropower	8230	48
Combined cycle	144	1
Total	17105	100

The electric power sector in Argentina is regulated by the National Electric Regulatory Institution (*Ente Nacional Regulador de Electricidad*, ENRE) which was created by Law No. 24065 in 1992. Its mission is to protect the consumer and regulate the electric sector (excluding nuclear power generation -which accounts for about 6% of total supply). The Energy Secretariat (*Secretaría de Energía*) develops policies, standards and general rules, while ENRE is involved on more detailed ruling and contract enforcement, including environmental issues. This institution is the environmental regulator at the national and provincial level. It is capable of producing decrees (called "ordenanzas") and of enforcing all legislation by giving warnings and penalties (suspension of operations and fines) to the concessionaires. ENRE and the Energy Secretariat closely follow environmental manuals and norms they have developed²². ENRE publishes an annual report which describes its environmental management duties and achievements (ENRE, 1996).

The environment unit of ENRE consists of only two professionals, but has the support of consultants and several other institutions that assist in monitoring and enforcement of environmental regulations.

Almost the entire electric power sector is already privatized. Each power company (generation, transmission or distribution) produces an environmental management plan (*Plan de Gestión Ambiental*) -at the most- every two years, which is reviewed and approved by ENRE.

²¹ They include, for example, the Ministries of Economy, Public Works and Services, Foreign Relations and International Commerce, Health and Social Action, Labor and Social Security, the Chief Cabinet of Ministries, etc.

²² See, for example, Manual de Gestión Ambiental del Sistema de Transporte Eléctrico de Extra Alta Tensión (Secretaría de Energía, 1992) and Manual de Gestión Ambiental de Centrales Térmicas Convencionales para Generación de Energía Eléctrica (Subsecretaría de Energía, 1990).

Environmental liabilities studies were performed by the private power companies -during the bidding process- and, in some instances, by the government. These studies were not very detailed but provided an assessment of the situation and served the purpose of developing management and remediation plans. Remediation actions followed and several problems were fixed in a three-year period after the concessions were given. According to ENRE's staff, few serious pollution problems have been reported.

Environmental auditing is self-performed by the private concessionaires. However, ENRE has on-line contractors that can act at any moment and verify collected data. An EIA is required for construction of a new power facility or modification of an existing one. For the former, the Energy Secretariat issues the license, while for the latter it is given by ENRE. Environmental liabilities assessment is performed either by the government (with the results given to the potential bidders) or by the bidding firms.

The environment has benefited well from privatization of the energy sector. There are environmental legislation and institutions that guarantee established standards (still being developed). Due to the fact that the supply is much larger than the demand, the institution that manages the wholesale of power supply (*Compañía Administradora del Mercado Mayorista Eléctrico Sociedad Anónima, CAMMESA*) only selects low price producers. These low-price suppliers are forced to have a very efficient infrastructure (usually gas-fueled) which greatly reduces the levels of NO_x and CO₂ for thermal plants, for example. This procedure has been very successful with power generation.

1.3. Water and Sanitation.

For years, Sanitary Infrastructure of the Nation (*Obras Sanitarias de la Nación*) managed water and sanitation systems of the country²³. It was characterized for its poor management and for little or no infrastructure investment. When the water and sanitation privatization occurred, this institution was eliminated and concessions of some provinces/cities in the country were given to private firms. The non-privatized services remained in the hands of their respective provinces and municipalities.

The greater Buenos Aires water and sanitation system (including the Federal Capital or "Capital Federal" and its seventeen districts called "partidos") was privatized in May of 1993 with a 30-year, \$4 billion concession. The operation and maintenance of the water/sanitation infrastructure was given to the French-Argentinean consortium Aguas Argentinas. The conservation of the water resources and enforcement duties were transferred to the Secretariat of Natural Resources and Sustainable Development and a regulatory agency was created: the *Ente Tripartito de Obras y Servicios Sanitarios (ETOSS)*. The governing board of this institution is composed of authorities representing the federal, provincial and local governments.

Aguas Argentinas made an evaluation of environmental liabilities and infrastructure prior to privatizing, but the true (and more severe) reality appeared after the concession. A detailed concession contract (including contractual allowable present and future pollution levels) was elaborated, however several issues were left out affecting the outcome of the evaluation. Environmental liabilities included: secondary streams that flow raw sewerage, groundwater contamination from improperly installed septic tanks, invasive mussels in intakes, lack of environmental compliance from the industry, earth (and trash) filling at river banks, illegal dredging in streams, water losses and sewerage overflows, etc. Contract renegotiations are being carried out at the moment (ETOSS, 1993)²⁴.

²³ Several towns and small cities have had water and sanitation utilities operated by municipal agencies and cooperatives.

²⁴ According to the original contract, renegotiation should be performed every five years. Since, 1993 two renegotiations have been carried out.

Aguas Argentinas has not accomplished the goals agreed in the contract due to several factors²⁵. According to the concessionaire, they have not gotten the pacted income for new connections (around \$500-600 for water and \$600-900 for sewerage per user) (Barbuto, 1997). Aguas Argentinas does its own monitoring. However, ETOSS audits Aguas Argentinas with the assistance of private firms, universities and research institutes (ETOSS, 1996). ETOSS verifies violations and denounces them to the Secretariat. ETOSS' income for enforcement and its operational duties come from a percentage (2.67%) of the water fee.

Public participation, through public audiences has not been yet implemented. However, user complaints (including environmental issues) are channeled through ETOSS. They also penalize the concessionaire when applicable.

The Province of Tucumán privatized its water/sanitation system (an \$80 million concession), but it resulted in a cancellation of the contract. Tucumán is a province with a large low-income population and the authorities claim they are not able to pay the high fee hikes (the new provincial government called for more-rapid investment and a 25% cut in tariffs). On the other hand, the operator was not able to deliver the water quantity and quality agreed to due to the lack of income and high amounts of debt (Lerena, 1997). The concessionaire was criticized for supplying contaminated water, operated by its partner Dragados y Construcciones of Spain (Poole, 1997).

The Provinces of Santa Fé and Córdoba have also privatized their services to Lyonnaise des Eaux, Sociedad General de Aguas de Barcelona of Spain and a number of Argentine interests (Poole, 1997). The Province of Mendoza has its water company (*Obras Sanitarias de Mendoza*) operating its facilities (as a private firm) but with an independent regulator (*Ente Provincial de Agua y Saneamiento or EPAS*) (EPAS, 1996). The regulator has been organized and trained –even though privatization has not yet occurred- with the support of IDB's FOMIN²⁶. (Inter-American Development Bank, 1994).

1.4. Ports.

According to the Federal Law of Ports all federal ports were transferred to the provinces to which they belong. The law also mandates that the provinces create their own port authorities (*Boletín Oficial de la República Argentina*, 1992 and 1993). Some provinces have already given thirty-year concessions to several private concessionaires. No environmental liability evaluation has been done during the transference and no formal environmental audit has been performed during privatization. However, the concessionaires have done some basic evaluation during the bidding process. They have also done environmental impact studies but this was dependent on existing legislation at the national, provincial and even municipal levels.

In February of 1997, joint decree 2/97 and 4/97 by the Sustainable Development Undersecretariat (*Subsecretaría de Desarrollo Sustentable*) and the Ports and Waterways Undersecretariat (*Subsecretaría de Puertos y Vías Navegables*), respectively, mandates that all existing ports (operating before June 1992) process an Environmental Declaration (*Declaración Ambiental*). This two-page form makes the port operator provide basic information and agree to fulfill all norms set by the National Ports Authority (*Autoridad Portuaria Nacional*), be willing to be audited at any time and communicate any environmental incident within 24 hours. This form is approved by the Undersecretariat of Ports and Waterways, and it issues a license. This document is obviously a very basic questionnaire and should include a commitment to perform an EIA study and a mitigation management/remediation plan if needed.

²⁵ Even though Aguas Argentinas has spent \$730 million on infrastructure improvements and is building a \$300 million underground wastewater system for more than 1 million people in Western Buenos Aires (Poole, 1997).

²⁶ FOMIN is the IDB's Multilateral Investment Fund (Fondo Multilateral de Inversiones) that promotes the development of the private sector and private investments in the Region.

The Naval Hydrography Service (*Servicio de Hidrografía Naval*) and the provincial authorities (through universities and other institutions) perform environmental monitoring. The provincial authorities also perform enforcement, unless the ports are located in national jurisdiction waterways (Paraná and Paraguay Rivers, and the Atlantic Ocean).

1.5. Roads.

All road concessions were given by the Secretariat of Public Infrastructure (*Secretaría de Obras Públicas*), an organization belonging to the Ministry of Economy, Infrastructure and Public Works (*Ministerio de Economía y Obras y Servicios Públicos*). The National Road Directorate (*Dirección Nacional de Vialidad*, DNV) is the decentralized technical branch of the Ministry, which is in charge of all environmental controls.

In the past, road concessionaires were not obligated to perform neither environmental liability studies nor EIA for the modification of existing roads or construction of new ones. In 1993, and with the support of the World Bank, a Civil Works Environment Evaluation and Management Manual (*Manual de Evaluación y Gestión Ambiental de Obras Civiles, 1993*) was developed. This is, however, a policy and framework document, with little detail related to technical specification levels. Based on this effort, a more specific document is currently being developed which is producing technical specifications (called “fichas ambientales”) to be used by consultants and civil works contractors. This is part of an IDB institutional strengthening operation.

The DNV is currently in the process of including the environmental regulations in the privatization terms of reference and even recommending the type of EIA to be performed.

The DNV can only work at federal level. The provinces are autonomous and are responsible for their roads. The World Bank is supporting an institutional strengthening of provincial authorities. The DNV does not perform environmental auditing and neither do the provinces. However, several municipalities and other organizations monitor air quality only.

1.6. . Airports

Main airports are scheduled to be privatized starting on 1998. No data was available when the fieldwork was performed.

2. BOLIVIA.

2.1. General Background.

Environmental management is divided among the three levels of government. At the national level, the Ministry of Sustainable Development and Planning (*Ministerio de Desarrollo Sostenible y Planificación*) issues policies, plans, programs and regulations regarding the protection of the environment and of natural resources. It also implements the EIAs and environmental quality control. At the departamental level, the *prefecturas* implement and enforce the environmental laws and issue environmental licenses and impose penalties. Municipalities have some limited authority in the execution of environmental policies and monitor standards, and review of the EIAs. All regional and local governments are supposed to have their own environmental units. However, only the large *departamentos* and cities have them in operating order and carry their mission with partial involvement. As a consequence very little environmental enforcement is being done. A future IDB loan (in preparation) may create and/or strengthen those units.

Bolivia has recently changed its central government in free elections, causing a nation-wide institutional rearrangement. This has produced a replacement of high level officials (at the end of 1997 some positions were still vacant) and the creation/elimination of several institutional offices. Several ministries were deleted or merged with others creating a new organizational scheme. For instance, the agency in charge of privatization is now the Vice-Ministry of Investment and Privatization (*Vice-Ministerio de Inversión y Privatización*)²⁷, under the Ministry of External Commerce and Investment (*Ministerio de Comercio Exterior e Inversión*). The former Ministry of Sustainable Development and Environment is now the Ministry of Sustainable Development and Planning (*Ministerio de Desarrollo Sostenible y Planificación*). This Ministry's responsibilities have increased and now include issues related to the environment, planning, gender, family, and indigenous affairs.

Privatized transportation, energy and water/sanitation sectors are being regulated by several superintendencies. Although each one is independent, they are all related to the National Regulatory System (*Sistema de Regulación Sectorial* or SIRESE). SIRESE also acts as a second instance for disputes between the concessionaires and the regulatory agencies (Ministerio de Capitalización, 1995).

In April of 1992, an environmental framework law called *Ley del Medio Ambiente* (Law No. 1333) was produced, and then in December of 1995 the regulations were approved by Supreme Decree No. 24176. Although the existing law is an important step forward, it is still incomplete.

A special environmental fund (*Fondo Nacional de Medio Ambiente* or FONAMA) was created years ago but, according to the present administration, it was mismanaged by the former Ministry of Sustainable Development and the Environment, producing no funding for protection, conservation or rehabilitation of areas with environmental problems. The fund is being re-launched but as a semi-independent initiative, reporting directly to the presidency.

There is a financial non-banking fund called National Fund for Regional Development (*Fondo Nacional de Desarrollo Regional* or FNDR). This fund collects financial resources from international institutions (multilateral banks and country donations) and from the Bolivian Treasury. Its mission is to provide funding for public and private investment projects. The fund is quite successful (100% repayment), and has around US\$ 500 million in current investment projects. The fund has invested in several projects with large

²⁷ Formerly known as the Ministry of Capitalization (*Ministerio de Capitalización*). During the Sánchez de Lozada Administration, privatization of public enterprises followed a special version of privatization called "capitalization". The government used capitalization capital to create social security funds supposedly owned by all Bolivian citizens.

environmental components (water supply and sanitation, solid waste, recreation areas, slaughtering houses, public markets, etc.). In the past, when environmental authorities were non-existent, the fund created environmental guidelines for auditing, impact assessment and monitoring.

As it was mentioned in the Environmental Report for the Structural Adjustment Program (IDB, 1995), Bolivia faces great environmental challenges during the privatization of public services. Although the country has an advanced environmental law, most privatized services did not comply with EIA, environmental liability evaluation²⁸ and, most importantly, environmental enforcement and remediation plans.

2.2. Energy.

Bolivia has an installed electric capacity of around 1009 MW (data from 1997), from which around 70% is provided from gas plants and the remaining from hydropower. There is very little output from diesel-fueled power plants. All generation, transmission and distribution of energy has been privatized with the exception of a cooperative that distributes electricity to the city of Santa Cruz. The former National Electric Power Company (*Empresa Nacional de Electricidad* or ENDE) contracted the firm “Environmental Resources Management” during September-October 1994 to perform an environmental audit but only partial results were disclosed. The World Bank also hired a consultant in October of 1993 who concluded that even though the global environmental impacts are relatively low (compared with the industrial and mining sectors), further detailed studies were needed, specially in diesel plants, to evaluate oil deposits, gas emissions, noise, soil and groundwater contamination, asbestos and disposal of used oils (IDB, 1995).

The former Ministry of Capitalization (*Ministerio de Capitalización*) implemented the privatization of enterprises in the energy sector. The Vice-Ministry of Energy and Hydrocarbons (*Vice Ministerio de Energía e Hidrocarburos*), under the existing Ministry of Economic Development (*Ministerio de Desarrollo Económico*), has an Energy Directorate with an environmental unit in which their main role is to monitor and enforce environmental legislation for all activities in the sector. They also evaluate all environmental permits for later review and approval from the Ministry of Sustainable Development and Planning. There is also a Superintendence of Energy (*Superintendencia de Energía*) which regulates the electric sector but does not have any environmental enforcement duties.

In the past, all upstream and downstream activities in the hydrocarbons sector were managed by a public agency called *Yacimientos Petroleros Fiscales de Bolivia* (YPFB). All upstream activities were privatized. YPFB has made an evaluation of environmental liabilities and the new owners are supposed to carry out remediation activities. In the downstream sector, only retail distributors were privatized. Refineries and storage facilities are still owned and operated by YPFB.

Environmental enforcement is supposed to be carried out by the Environmental Unit of the Vice-Ministry of Energy and Hydrocarbons (*Unidad Ambiental, Vice Ministerio de Energía e Hidrocarburos*), Ministry of Economic Development in coordination with the Ministry of Sustainable Development and Planning. There are regulations of hydrocarbons in which technical, safety and environmental issues are normed and have to be followed by all public and private companies in the sector.

Regulation and enforcement of the hydrocarbons sector is carried out by the Superintendence of Hydrocarbons (*Superintendencia de Hidrocarburos*). In case of future privatization of downstream

²⁸ In many cases the government has assumed all environmental liabilities. This is, however, an incomplete action until a remediation plan and enforcement are implemented.

companies or for giving any new concessions, the Superintendence will coordinate environmental issues with the Vice-Ministry of Energy and Hydrocarbons.

2.3. Water and Sanitation.

Water supply and sanitation companies belong to local governments and cooperatives. However, most recently SAMAPA, the Water Company in charge of the Cities of La Paz and El Alto has been privatized to an international consortium led by the French firm Lyonnaise des Eaux. This thirty-year concession is called *Aguas del Illimani, S.A.* (Waters of Illimani) (Superintendencia de Aguas, 1997).

La Paz and El Alto have around 700,000 and 500,00 inhabitants, respectively. However, the first has 150,000 connections while the latter only 30,000. El Alto has a very low-income population living in alarming poverty levels. Aguas del Illimani plans to increase the number of connections to 71,000 by the year 2001. Since August 1, 1997 water rates were hiked 45%.

Aguas del Illimani has the water and sanitation concession plus the rights to collect water in 14 adjacent basins. They are not responsible for the rain drainage system. All sewerage of the city of La Paz is disposed (without any treatment) to the Choqueyapo River. Downstream farmers use those waters for growing small vegetables that are later sold in La Paz. Aguas del Illimani has contractual obligations to implement a mitigation plan. However, during the first five years of the concession, beginning in 1998, the company is supposed to study the problem and present alternative of solutions. Aguas del Illimani will also start an industrial pollution inventory in March of 1998. With this information, the company will renegotiate the contract and new sanitation fees will be determined.

Sewerage from the city of El Alto also drains raw to Lake Titicaca. However, with the financial support of the World Bank and other international agencies, oxidation ponds are being built in order to mitigate severe water pollution problems.

The city of Cochabamba water supply and Sanitation Company (SEMAPA) is in the process of being privatized. Cochabamba is a growing city with severe water supply problems. The Misticuni project (a costly interbasin water supply initiative) may provide the well-needed resource.

Bolivia's water regulator is the Superintendence of Waters (*Superintendencia de Aguas*). This institution, the national regulator of all water companies, agreed on water quality levels in the Aguas del Illimani's contract (Superintendencia de Aguas, 1997). The concessionaire has the obligation to self-monitor its water releases but with the control and certification of a private firm paid by the company, which raises an issue of conflict of interest.

2.4. Transportation.

The former Ministry of Capitalization has privatized the following in the transportation sector: three airports (El Alto International, Cochabamba and Santa Cruz), the flag airline Lloyd Aereo Boliviano and two railroad systems.

The airport concessionaire (only one company) has contractual investment obligations for a 25-year concession. They have produced an EIA (July 1997) and are pending approval from the Ministry of Sustainable Development and Planning. Apparently, there has been no environmental liability evaluation. Environmental enforcement has to be done by the Ministry but there are no signs that this has been achieved.

Bolivia has also privatized two railroad concessions for the operation of an existing (and old) system. No environmental liability assessment has been performed. However, a new path connecting both independent nets is being scheduled, and the Superintendence of Transportation will require an EIA for obtaining its license.

3. CHILE.

3.1. **General Background.**

Chile is the only Latin American country that has shown spectacular (and consistent) macroeconomic results for more than fifteen years. However, this economic progress has caused significant environmental degradation due to the heavy extraction of natural resources, the production of raw materials, and the result of implementing sectoral policies without concern for the environment (Inter-American Development Bank, 1996).

The primary responsibility for environmental management is assigned to an inter-ministerial coordination entity called the National Environmental Commission (*Comisión Nacional del Medio Ambiente* or CONAMA). It does not have executive functions. All execution, inspections and control remain within the Ministries and regulatory agencies (created to regulate privatized public services and private participation). All of them have environmental units who are in charge of environmental affairs. Environmental legal provisions have historically been scattered among sectoral agencies' legislation. Some were introduced at the beginning of the century²⁹, others have resulted from international agreements, but most norms and regulations are part of sectoral legislation that has been introduced in response to emerging situations or problems.

The Chilean Constitution (Article 19) recognizes the right to live in an environment free of pollution. The Environmental Act (*Ley de Bases del Medio Ambiente*), approved in 1992 (CONAMA, 1997), brings to bear the principles of environmental liability and forces the infringer to repair damages caused to the environment. This law mandates the implementation of an Environmental Impact Assessment System³⁰ as a management instrument for preventive environmental protection. CONAMA is the institution responsible for the review of the methodological multi-, and inter-disciplinary aspects of the EIAs. Responsibilities for enforcing the EIAs are dispersed among the several sectoral institutions involved in the permit and authorization process³¹. Self-monitoring of industries is encouraged but is not mandatory.

Independent commissions (usually attached to different ministries or government agencies) carried out privatization and the executive branch of the government awarded concessions. Multilateral financial institutions have had very little participation in those privatization activities.

3.2. **Energy and Mining.**

For years, Chile's main electricity grid has been run by a duopoly that has kept prices high. So much that the country's main electric companies accounted for more than 40% of the capitalization of the Santiago stock exchange (The Wall Street Journal, 1996). However, Chile has privatized most of its electric utilities since

²⁹ For instance, a prohibition on disposing solid waste in water courses dates from 1916, and only became operational in 1995 (Republic of Chile, 1916).

³⁰ See Reglamento del Sistema de Impacto Ambiental (CONAMA, 1997).

³¹ A detailed description is given in the report entitled *Gestión Ambiental del Gobierno de Chile* (CONAMA, 1997).

the early 1980s³² giving very little or no consideration to environmental liabilities created. Government and public interest in environmental affairs did not start until the 1990s. The country lacks oil and gas reserves and gets its electric energy from hydro, carbon and oil power plants³³. In 1990 (when most electric utilities were already privatized), emissions of Carbon Monoxide increased by 33% since 1975. The same occurred with other components and particulates (OLADE/CEPAL/GTZ, 1996). However, since 1990 Chile has created environmental legal and institutional arrangements to lessen pollution levels. Special emphasis has been given to the Santiago metropolitan area, in which a strict master plan is being enforced to reduce emissions and promote energy savings.

After having Santiago be one of the most air-polluted cities in the world, Chile is increasing its awareness for environmental conservation. As an example, cases like the Ralco Hydropower Plant (400 MW) in the Bio-Bio River have caused intense debate, and as a result helped environmental causes. In another instance, Chile will be importing gas from Argentina for its cities and booming industry (specially mining) in the north³⁴. This will curb air pollution and greatly benefit the environment.

Electric utility enforcement is done by several local and central government agencies like CONAMA and the Ministry of Health. Utilities also do self-monitoring. The regulatory agency called Energy Commission (*Comisión de Energía* or CDE), does not enforce environmental standards but, as a member of CONAMA, gives advice in this matter. New tariffs are set by the CDE but the environmental effects are not included in it.

Chile has a very active and progressive mining sector with high government stakes. For instance, government-owned mining copper corporation giant CODELCO has sales that exceed the US\$ 2 billion per year, and it represents 50% of mining production in Chile. However, CODELCO invests approximately US\$ 300 million in environmental matters per annum.

3.3. Water and Sanitation.

Chile is composed of 13 geo-political regions: one for the Santiago metropolitan area and 12 others around the nation. According to the Superintendence of Sanitary Services or SSS (Superintendencia de Servicios Sanitarios, 1996) each region has at least one water and sanitation company (the so-called “sanitarias”) which are owned by:

- (i) The government through its Development Corporation (*Corporación de Fomento* or CORFO), a large holding enterprise. They service 11.2 and 2.3 million people in urban and rural areas, respectively³⁵.
- (ii) Nine private companies that serve close to 1 million people in urban areas.

Most regions are operated by CORFO companies with the exception of Region 10 (*Aguas Décima*)³⁶ and other small ones immersed in different regions. The government companies act as private firms.

³² An interesting report that shows the latest private electric sector moves is discussed in an article by Paulo Prada and Jonathan Friedland (The Wall Street Journal, August 4, 1997).

³³ Traditionally, Chile has counted on hydropower for 80% of its power needs, generating the rest from coal (The Wall Street Journal, October 16, 1996).

³⁴ See Wall Street Journal article by Jonathan Friedland (August 4, 1997) in which he discusses the projects and impacts to the country's economy.

³⁵ Chile had 14.5 million users at the end of 1996. Water is supplied to over 98% of the population while wastewater services are provided to 86.4% (Ministerio de Obras Públicas, 1997).

³⁶ Owned by the Aguas Quintas Group.

They all have a governing board, a professional management team and have to follow the so-called “enterprise model” (“empresa modelo”) that mandates profitability and efficiency. No water company gives any subsidies to users. Under Chilean law, water utilities should not discriminate in charging for water use. Lower income users, who are unable of paying their water bills, get a direct subsidy from their local governments (i.e. municipalities), who directly pay their share to the water company.

Most “sanitarias” have four different (perpetual) concessions given by the Superintendencia of Sanitary Services, its regulatory agency. These are: (i) water extraction and treatment, (ii) distribution, (iii) wastewater collection, and (iv) wastewater treatment. Each concession has a different tariffs set by the SSS. The SSS³⁷ supervises all water companies operations but also develops norms and standards for water, wastewater and liquid releases (Superintendencia de Servicios Sanitarios, 1995). Environmental auditing is self-performed but the SSS does random testing (for water supply only).

The Metropolitan Region of Santiago (*Región Metropolitana*) is operated by EMOS (owned by CORFO) that managed to turn a profit of 10.9% from its 1 million customers (Poole, 1997). Most regional water companies are also profitable but not as much as EMOS. Few private water companies are operative in Chile. One of those is a small private firm called Aguas Cordillera³⁸ which operates within Santiago in the wealthy suburb of Lo Castillo, (around 70,000 connections) which has water extraction, treatment and distribution rights only (Lo Castillo, 1996). However, there are few BOOT projects with the regional (public) water companies. One example is a water treatment plant in Antofagasta by British firm Bywater (Fairweather, 1997).

Wastewater is discharged raw to different water bodies. The SSS believes that 20% of the waters are treated but they include raw releases by submarine ocean outflows. Poole (1997) estimates that only 15% of the country’s sewerage gets any treatment; Fairweather (1997) estimates between 3 and 9%. There is a small wastewater treatment prototype plant in Santiago³⁹ that cleans waters at very high costs⁴⁰. The SSS plans to have 50% of their wastewater treated by the year 2000.

Water rights have been privatized in Chile. They can be used -as any asset- in any commercial transaction. The General Water Directorate (*Dirección General de Aguas* or DGA) supervises the process but does not act as a regulatory agency (there is a free market for water rights). As an example, Aguas Cordillera has water rights of 4 m³/s. For that area 1 l/s costs around US\$ 4500.

3.4. Transportation.

The Ministry of Public Works (*Ministerio de Obras Públicas* or MOP) is in charge through its National Concession Programs (*Programa Nacional de Concesiones*), of giving concessions for roads, ports and airports. Table 3.1. shows the current and forecasted investment for MOP concessions:

37 The SSS (created in 1988 by law No. 18.902, received its mission and authority by decree No. 382/88 from the Ministry of Public Works.

38 Aguas Cordillera is owned by Enersis, which operates the majority of the main electric national grid.

39 This facility has 16 oxidation basins, 3 reservoirs, occupies 140 ha but only produces 200 l/s of good quality water. The estimated need for Santiago is around 14 m³/s.

40 Chloration of wastewater considerably increases the treatment costs. The total cost for wastewater treated for the Santiago area would be around US\$ 0.50 per m³.

Table 3.1. Current and estimated investment (in US\$ millions) in total MOP concessions (MOP, 1997).

YEAR	1993	1994	1995	1996*	1997*	1998*	1999*
Investment	42	30	562	1117	1781	610	420

*: Estimated.

All infrastructure to be privatized (as well as any other private or public project to be built or modified) requires an EIA⁴¹ in order to obtain a permit from CONAMA. Enforcement during and after construction is the responsibility of the MOP's Inspector (*Inspector Fiscal*) who is authorized to penalize in case of violations.

By November 1997, 12 road routes were already privatized. By the end of 1997, 9 airports⁴² have been concessioned. One of those is the Santiago's Merino Benitez International Airport, for which an EIA is in the process of being completed. Ports will be privatized starting in 1998; however, several of their facilities have been already concessioned.

4. MEXICO.

4.1. General Background.

The top federal environmental institution is the Secretariat for the Environment, Natural Resources and Fisheries (*Secretaría de Medio Ambiente, Recursos Naturales y Pesca, SEMARNAP*). Its principal objective is the promotion of environmentally sustained development and the integral care of the physical components of the natural resources.

The Political Constitution of the United States of Mexico (*Constitución Política de los Estados Unidos Mexicanos*) establishes a general structure for the environmental role of the government. The attributions of the Federation (as the Federal government in Mexico is called), states and municipalities are settled in the Ecological Equilibrium and Environmental Protection General Act (*Ley General del Equilibrio Ecológico y la Protección Ambiental*, 1997). This framework law was amended on December of 1996 and was the outcome of an extensive consultation process among federal and local authorities, business enterprises, and social and academic institutions. Significant changes (from the privatization of public services point of view⁴³) have been included in order to initiate the process of decentralization of issues of local concern, broadening the opportunities of citizen involvement in environmental management and strengthening environmental policy instruments. Also environmental offenses are included in the Criminal Code (*Código Penal*⁴⁴) in order to prosecute violators whose actions are harmful to the environment, natural resources, flora and fauna, public health and biodiversity in general.

41 Chile's law makes EIAs obligatory only for highways and not public roads. However, the MOP makes EIA for all of them mandatory.

42 This includes major airports and small ones called "aeródromos".

43 Even though the Mexican Environmental Law does not distinguish private and public enterprises and their changes of ownership.

44 An attachment entitled Environmental Offenses (*Delitos Ambientales*) is included in the General Law on Ecological Equilibrium and Environmental Protection.

As is typical in most federal governments, each state and local authorities have their own regulations and institutional arrangements with close links to the federal ones. In Mexico, most states have environmental regulations and authorities. For instance, Mexico's Federal District (*Distrito Federal de México*) has its own environmental law (*Ley Ambiental del Distrito Federal, 1996*) which complements the federal laws and regulations. However, this is not true in all local governments (i.e. municipalities). In the case of some public services like gas, electricity, water and transportation infrastructure (federal roads, ports and airports) the federal government has whole jurisdiction and is the only designated manager/operator. However, the government can assign time-limited licenses for the exploitation and use of those resources.

The National Institute of Ecology (*Instituto Nacional de Ecología, INE*) belongs to SEMARNAP and has as its main role to develop policy and regulations. However, it also reviews EIAs and provides a resolution in which the project is: (i) authorized to proceed "as is", (ii) rejected, or (iii) authorized with conditions (which are listed). In the last few years and due to recent legislation, large amounts of EIAs have been submitted to the INE (around 1200 per year). The law requires that INE should produce a resolution within 120 days after its submission, and in an effort to comply, resources have been increased, reducing the massive backlog significantly.

Considering that private enterprises need several environmental licenses (that usually take a long term to process), the SEMARNAP has grouped all of them in to one called the Exclusive Environmental License (*Licencia Ambiental Unica* or LAU), and also issues the Annual Operation Certification (*Cédula de Operación Annual*)⁴⁵. This applies to industrial plants needing licenses for activities involving considerable environmental risk, atmospheric emissions, generation and management of dangerous waste, and water services. The LAU is given only once and has to be requested again only for location or production sector changes. Variation in industry outputs or ownership only needs to be updated. The LAU is a requirement for being included in the Voluntary Program of Environmental Management (*Programa Voluntario de Gestión Ambiental*)⁴⁶.

The Federal Attorney General's Office for Environmental Protection (*Procuraduría Federal de Protección al Ambiente, PROFEPA*), an attaché bureau of the SEMARNAP⁴⁷, is in charge of the environmental surveillance of industrial pollution, fisheries and forests (flora and fauna) at the federal level⁴⁸. It is also involved in public participation and education and training activities. Environmental auditing is performed regularly. For instance, from 5,000 major industries, around 900 were audited in 1997; also 90% of all small and medium size industries (around 90,000). Several industries/facilities to be privatized were already audited, for example, PEMEX (*Petroleos de México*) refineries, airports, railroads, and ports.

In spite of PROFEPA's lack of adequate resources to properly fulfill its mission, it plans to increase visits to 10,000 per year. Figures show that their efforts are paying off, given that in 1992 approximately 20% of all inspected companies were closed due to non-compliance, as opposed to 2% currently. While PROFEPA is in charge of environmental surveillance, the National Water Commission (*Comisión Nacional del Agua* or CNA) enforces water quality standards at the Federal level.

45 See document entitled "Instructivo General de la Licencia Ambiental Unica (LAU) y la Cédula de Operación Anual" (1997) by SEMARNAP.

46 A wide discussion is provided in the Proceedings of the International Workshop of Direct Regulation Practices and Environmental Certification (Quadri *et al.*, 1997).

47 Reported by Jose L. Calderón Bartheuf.

48 State laws exist but do not have regulations.

The Secretariat of Finance (*Secretaría de Hacienda*) is in charge of creating incentives for pollution reduction, however none have been established to date.

The Mexican government has privatized several state-owned companies. It is focusing on the modernization and reorganization of infrastructure services, including drinking water supply, sanitation, wastewater treatment, electric power, and irrigation and drainage. The power sector is slowly being deregulated; there is already private sector participation of some magnitude in the provision of drinking water supply and sanitation services, particularly wastewater treatment; and one of the most ambitious irrigation management transfer programs in the world is being implemented. Private sector participation in the provision of water-related public services is not through divestiture, but through concessions, BOT contracts, joint ventures, etc. (ECLAC, 1998).

The Inter-Secretariat De-incorporation Commission (Comisión Intersecretarial de Desincorporación), created in 1995, manages the privatization process. The National Bank of Civil Works and Public Services (*Banco Nacional de Obras y Servicios Públicos* or BANOBRAS) grants loans and has a guarantee program for infrastructure development (ECLAC, 1998).

Table 4.1. Construction and total estimated investment for the Privatization program for the period 1995-2000 in US\$ million (Wylegala, 1996).

SECTOR	CONSTRUCTION	TOTAL
Telecommunications	500	12000
Electric Power	4000	10000
Roads	7000	7000
Natural gas	2500	3500
Railroads	2500	3500
Petrochemicals	1600	3000
Airports	1500	2500
Ports	1000	1250
Total	20600	42750

4.2. Energy.

PEMEX is the oil and gas corporation wholly-owned by the government (since its nationalization in 1938) which has the rights of exploring gas and oil reserves, and exclusive rights for exploitation. PEMEX is the second largest oil company of Latin America after Venezuela's PDVSA. Revenues in 1996 reached US\$ 28,820 million (an increase of 27.2% with regards to 1995) for average daily production of 2,855 barrels of crude oil. PEMEX pays about 67 cents for each dollar of earnings, and accounts for 25% of total tax revenue collected by the government. While there are no plans to privatize this oil giant, government officials acknowledge that the company is cash-starved and that could lead to opportunities for private contractors. So far, since 1995, private companies are sharing storage, transportation and distribution privileges. The lack of new investment and equipment upgrades has led to a number of problems. PEMEX has been wracked by a series of deadly accidents and its older installations have also been criticized for environmental pollution (Latin Trade, 1997).

The Federal Electric Commission (*Comisión Federal de Electricidad*, CFE) is the government's electricity agency. It is in charge of generation, transmission and distribution. It manages around of 44,000 MW⁴⁹ of power (data of 1995), 300,000 km of distribution, 60,000 km of transmission; it has been operational for over 60 years and currently employs approximately 50,000 people. Around 5% of the electric sector is in private hands. The private sector can invest but under certain restrictions (i.e. self-generation, small generation, etc.). There are only two carbon power plants (one in operation) and the most recent ones are gas-generated⁵⁰.

It is not expected, in the short run, that the CFE will be privatized, although the new regulatory law has managed to attract private investment to the sector through "build, lease and transfer" (BLT) and "external energy supplier" (PEE) arrangements. An important milestone was the granting in March, 1997 by the CRE of the first license (28 years and six months, renewable) to generate electricity, as an independent producer, to the AES Mérida III consortium. It has a capacity over 500 MW and required a \$200 million investment. It is anticipated that in 1998 bids will be called for 14 new generation projects with a total capacity of 3,392 MW, for 5 transmission projects of 2,910 kilometers, and for 4 transformation projects. Overall, it is estimated that of the 11,000 MW of new capacity required by Mexico, before the year 2005, some 9,750 MW will be built by private investors (ECLAC, 1998).

CFE has an Environmental Protection Section (*Gerencia de Protección Ambiental*) which is in charge of self-monitoring, inspections, supervision of CFE's infrastructure building and environmental auditing. This section has around 50 specialists but all power plants have their own environmental professionals, totaling 200.

The 1992 Electric Energy Public Services Law (*Ley del Servicio Público de Energía Eléctrica*) and the 1995 Regulatory Law of Constitutional Article 27 on Petroleum (*Ley Reglamentaria del Artículo 27 en el Ramo del Petróleo*) gave the opportunity for private participation in the construction, operation and ownership of electric power facilities and for the transportation, storage and distribution of natural gas (a right previously reserved exclusively to CFE and PEMEX). The Federal Congress approved a law for the creation of the Energy Regulatory Commission (*Comisión Reguladora de Energía* or CRE) in October of 1995⁵¹. This institution is a decentralized entity that belongs to the Energy Secretariat (*Secretaría de Energía*). Its main mission is to regulate electric energy and natural gas. They decide on new tariffs and provide licenses for new power plants (CRE, 1996)⁵². In order to obtain new licenses, applicants must fulfill the environmental requirements of the SEMARNAP. Even though CFE does not need a license from the CRE and PEMEX does, they have to comply with SEMARNAP's requirements for new facilities. Mexico has a very large storage of natural gas and has an increasing demand (Secretaría de Energía, 1997).

4.3. Water and Sanitation.

Water has always been a strategic and very important resource for Mexico. The country has one of the biggest water-supply problems in the continent. More than a third of its 90 million people live over 2,000 meters above sea level, where there is only 4% of the country's natural water supply. Mexico City, for example, must pump a third of its water from more than 120 kilometers away and up through an altitude of

49 Including: 32,139 MW of thermal, 10,013 MW of hydropower, 1,350 MW of nuclear power and 755 MW of geothermal generation (ECLAC, 1998).

50 A recent project, Mérida III, has a gas pipeline built by private initiative (under the build, operate and own scheme, BOO) and financed by IDB.

51 See document by CRE.

52 A list of new licenses is listed in 1996 CRE's annual report.

some 1,200 meters. A third of the capital's water is lost through leaks or wasteful usage, which works out to an average consumption rate of 3.5 cubic meters per capita, twice the level of many industrialized countries (Poole, 1997).

CNA, which is an independent and decentralized institution of the SEMARNAP, manages all federal waters. Mexico has a Water Law (*Ley de Aguas*) and regulations promulgated on December of 1992 and January of 1994, respectively. Both the Law and its regulations have special sections for prevention and pollution control and penalties. The Mexican Institute of Water Technology (*Instituto Mexicano de Tecnologías del Agua*, IMTA) acts as the CNA's technical branch.

The CNA gives two kinds of permits for water use: (i) concessions to the private sector, and (ii) designation or "*asignación*" to the public sector. Both licenses are for specific uses of water, human consumption being the highest priority.

The Federal Rights Law (*Ley Federal de Derechos*) assigns water tariffs for water supply to cities and non-domestic use for different zones of the country. According to the law, water is a common good for all citizens and has to be supplied to them. In case of non-payment of water bills, the water company can only "restrict" the supply but not suspend the service. Water supply and sanitation quality is monitored by the Secretary of Health and is enforced by the CNA.

Water rights are given to private citizens for a minimum of 5 and a maximum of 50 years. Seniority rights are being followed. Agricultural waters are free of charge. The CNA has decentralized the operation and maintenance, and gave the infrastructure (mainly agricultural) and the operational responsibility to all users. This has caused a labor problem because a large number of former employees (mostly operators- over 20,000) were not re-hired by the water user associations and CNA is finding ways to lay them off.

There are some water supply privatization experiences in Mexico. One of the most recent is the one in the Federal District (*Distrito Federal* or DF) which (due to its dimensions) was divided in four zones with four different private concessionaires⁵³. The entire process has four stages: (i) inventory of the network and design of the commercial system, (ii) implementation of the commercial system (measurement and payment), (iii) operation and maintenance, and (iv) infrastructure investment. At the end of 1997, the concessions are at the end of stage ii. CNA has awarded water supply and sanitation concessions to all of them. It is expected that in stage 4, the firms will install sewerage treatment plants⁵⁴. CNA will remain the water wholesaler for the DF.

Other water supply and sanitation experiences are Cancún (long term concession; 16 "delegaciones⁵⁵") and Aguas Calientes (Municipal Concession). Under NAFTA, a \$10 billion plan was sketched out to clean up the highly polluted Rio Grande del Norte on the Mexico-US border. But little has been achieved at the end of 1997. A sewerage-treatment plant for the city of Ciudad Juárez was approved in 1995, but work is only expected to start by the end of 1997 because of lack of financing (Poole, 1997). In 1992, Burns & McDonnell with Mexican partner Dycusa won the \$60 million sewerage treatment plant for the city of Monterrey. This facility would treat 443 million liters

53 The four companies (all different) are composed of Mexican enterprises and foreign firms (two French and two English).

54 The so-called "mega-plants" with treatment flows around 70 m³/s.

55 A "delegación" is the equivalent of a small municipality, which usually make, with several others, a metropolitan area or a large city.

per day generated by the city's industrial plants and 3 million citizens. The deal was 80% financed by Japan's Overseas Economic Cooperation Fund and 20% by the Mexican Government (Poole, 1997).

Wastewater collection and disposal violate minimum and maximum standards mandated by Mexican law. The government lacks resources for monitoring, developing and rehabilitating appropriate infrastructure. In sanitation alone, Mexico has had several experiences for implementing wastewater treatment plants. They were (are) mostly built by BOT56 contracts with private companies. Some cities with these services are: Puerto Vallarta57, Cuernavaca, Toluca, León, Tampico, Ciudad Obregón, San Luis Potosí, Chihuahua Norte, La Paz, etc. According to CNA officials (Cerón, 1997), out of the 42 plants they have selected for concession only 7 are operating efficiently, 17 are in the process of construction and 18 have not been awarded yet or have technical problems. Private and public sector officials estimate that Mexico needs to invest at least US\$ 6 billion to solve its municipal wastewater needs in major municipalities.

The high cost of treatment has caused very high sewerage rates. For instance, Puerto Vallarta's sewerage fee is around 60% of the total water bill (even though the plant itself and its effluent follow high international standards). This has caused serious problems like default payment to the private concessionaires, non-use of facilities or their use below its design capacity.

4.4. Federal Roads and Urban Transportation.

Mexico has a wide experience of private transportation concessions (mainly done by BOT)58. Between 1987 and 1994, 5,316 km of new roads were built with private participation. During the Salinas Administration a decade ago, the privatization program granted concessions for the construction and operation of over fifty two toll roads (Cerón, 1997). Those highways, financed with dollar-denominated debt, fell victim of higher-than-expected construction costs and the peso devaluation (the so-called *Tequila* Effect). The concessionaires increased their tolls but kept users off those roads. The private operators (mainly construction companies)59 defaulted bank loan payments (adducing low or no profitability at all) creating a financial crisis. The Mexican government, in order to avoid increasing negative effects to the economy went through a controversial bailout process for half of the concessions for a total of 3,430 km. The Wall Street Journal (Millman, 1997) reports that the federal government will assume all bank liabilities for 23 of 52 toll roads, replacing them with an initial outlay of some \$2.3 billion in government-backed bonds. The government estimates the cost of assuming responsibility for the toll road system could run as high as \$7 billion over the next 30 years, but expects better management to substantially reduce those costs.

When required by environmental laws, the Communications and Transportation Secretariat (*Secretaría de Comunicaciones y Transportes, SCT*) claims it obtained respective licenses before construction or rehabilitation of privatized roads60. Now, all privatized new or existing routes require an EIA and environmental mitigation studies. The PROFEPA is in charge of supervising the construction of roads (since 1992). The Secretary of Communications and Transport has recently created an environmental unit that is in charge of all environmental duties in the construction or rehabilitation of federal roads.

56 Private sector participation scheme commonly called "build, operate and transfer".

57 This 50-year, \$33 million facility is operated by British firm Bywater who claims this is the first wastewater BOOT in the world.

58 According to STC, the first one was done in 1952.

59 As an example, the Grupo Mexicano de Desarrollo lost US\$ 600 million in the concessions program and has been teetering on the edge of bankruptcy (Cerón, 1997). Similar problems were reported by Empresas ICA S.A. and Tribasa (Millman, 1997).

60 Note that most institutional and legal environmental arrangements were created after the road privatization program.

Mexico City, the largest city on earth, is known for its very high levels of air pollution. The city alone has around 115,000 public vehicles (with 27,000 buses and mini-buses) and around 30,000 more come daily from different areas of the State of Mexico. The Transportation and Roads Secretariat (*Secretaría de Transportes y Vialidad*) and the Secretariat of Environment (*Secretaría de Medio Ambiente*) of the Federal District's government (called *Departamento del Distrito Federal*) have developed the Transportation Law for the Federal District (*Ley de Transporte del Distrito Federal*, 1995) in which a series of regulations were given in order to get low contamination engines and implement an emissions control programs.

The transportation law is complemented by the Environment Secretariat's Regulations of the Ecological Equilibrium and Environmental Protection General Act for the Prevention and Control of Combustion Engine Vehicles that circulate in the Federal District and Municipalities of the Urban Surrounding Zones (*Reglamento de la Ley General del Equilibrio Ecológico y la Protección al Ambiente para la Prevención y Control de la Contaminación generada por los vehículos automotores que circulan por el Distrito Federal y los Municipios de su Zona Conurbada*, 1988). Also, the Federal District authorities have united forces with the central government (mainly the SEMARNAP and the Secretary of Health) and municipalities of the metropolitan areas of the Valley of Mexico and have created the Metropolitan Environmental Commission (*Comisión Ambiental Metropolitana*) which is immersed in the ambitious Program for Improving the Air Quality in the Valley of Mexico (*Programa para Mejorar la Calidad del Aire en el Valle de México*).

Based on the regulations mentioned above and the already defined strategies, standards and goals, the government of Mexico City decided to privatize bus Route 100 (*Ruta 100*) one of its largest public routes. This route was declared bankrupt (due to administrative and union deficiencies and after years of large subsidies) with a fleet that violated all environmental standards. Around 60 % of the total number of buses (from a total of 3,000) were given in concessions to 10 private (national) enterprises. The city mandated that all buses (all brand new) should follow environmental and safety standards (technical specifications were made available at the bidding process). Unfortunately, only three of those enterprises are operational and the remaining do not have either the financial or the managerial skills to function.

Environmental enforcement is performed by 60 authorized Verification Centers (*Centros de Verificación*) around the city, and the DF's Environment Secretariat. All vehicles do not circulate at least one day a week and this is enforced by the police. The use of natural gas is also a priority and vehicles are slowly being conditioned for its use.

4.5. Railroads.

Congress amended the Mexican Political Constitution⁶¹ in order to consider railroad services a non-strategic activity. This transformation continued with the approval by Congress of the Law Regulating Railroad Services (*Ley Reglamentaria del Servicio Ferroviario*, 1995) and the Regulations for Railroad Services (*Reglamento del Servicio Ferroviario*, 1996). This legislation strongly promotes private investment in this sector.

The Mexican railway system has an estimated market share of 20% of freight transported by land. It used to be operated by a government enterprise called National Trains of Mexico (*Ferrocarriles Nacionales de México* or FNM). The system has 26, 477 km of track, of which 77% are primary lines and the remainder are short or private lines. FNM operated 1,426 locomotives with an average age of 14 years and aggregate

61 Article 28.

horsepower of 3.8. Its freight fleet consisted of 31,706 cars in operating condition. It handled over 52 million metric tons of freight in 1995 (*Secretaría de Comunicaciones y Transporte*, 1995).

The privatizing agency, the Mexican Railroad System Restructuring Committee, divided the entire system in several routes. So far, three major railroads (50-year concessions) and some smaller ones (30-year concessions) have been privatized. The government has hired international corporations to perform environmental audits and has committed the new concessionaires to mitigate all liabilities⁶². However, this audit was performed only at their storage warehouses and maintenance shops and it did not involve all the track lines. The contract specifies that if the new owner finds any environmental liabilities in their routes (i.e. spills) the government will be fully responsible for its cleanup.

So far, railroad privatization has shown some encouraging results. For instance, the first privatized railroad route has operated for six months with 40% less fuel (diesel) than the year before.

4.6. Ports and Airports.

The July 1993 Port Law (*Ley de Puertos*) decentralized the port system, establishing the Integral Port Administration (*Administración Portuaria Integral* or API), specifically at each one of the 22 ports. API, as the landlord, assumes responsibility for the assets, liabilities and administrative functions. At the end of 1997, around of 90% of cargo terminals had been privatized as well as the tourist port of Acapulco (Wylegala, 1996). The government claims they will be in charge of mitigating any environmental liabilities but no details of such activities are available.

A major canal concession has been awarded to Grupo Protexa of Mexico together with Boskalis of Holland to build, operate and maintain a 438-kilometer intracoastal canal, linking the Port of Tampico, Mexico with the intracoastal waterways of the United States at Brownsville, Texas. The \$756 million project will create a direct water route between the port of Tampico and inland river ports of the United States, including Chicago, Kansas City and Pittsburgh. The route is expected to provide a cheaper alternative to other means of transportation, such as road or rail (ECLAC, 1998).

Privatization of airports has not started yet. The Airports Administration Agency (*Aeropuertos y Servicios Auxiliares*, ASA) has established that 58 airports will be privatized. Of those, 35 correspond to large and medium size, which will be divided in four groups⁶³. As with railroads, the government claims it will give the concessions free of environmental, financial and labor liabilities. ASA's environmental audits (through environmental specialty firms) began in 1996 and PROFEPA felt that there was a need to sign an agreement to help ASA comply with the environmental regulations already in place for underground fuel storage tanks

⁶² Government officials claim that all new concessionaires will not inherit any environmental, financial or labor liabilities. A United States Trade and Development Agency study (made by Brown & Root) reports that FNM was going to invest US\$ 22 million in environmental remediation (Wylegala, 1997).

⁶³ ASA is studying a new –and innovative– way of privatizing all airports. This would follow a “capital democratization” principle in which all Mexican citizens will have the opportunity to get ownership of shares of the newly formed enterprises.

and air terminals. On June 3, 1997, ASA and the PROFEPA signed an agreement to conduct environmental audits on 20 Mexican airports during the following six months (Wylegala, 1997). The total estimated cost of the project was US\$ 1.8 million, however, no data was available about the results of this endeavor.

5. PANAMA.

5.1. General Background.

Panama's national environmental policies are defined in Chapter 7 of its Political Constitution. Environmental management, evaluation, control, enforcement and protection responsibilities are distributed in several ministries⁶⁴, autonomous and semi-autonomous institutions and municipalities. Institutions with high level environmental obligations are: (i) the National Institute of Natural Renewable Resources (*Instituto Nacional de Recursos Naturales Renovables* or INRENARE), which is an autonomous entity in charge of policy development and planning, and coordination of the use and conservation of natural renewable resources, and (ii) the National Environmental Commission (*Comisión Nacional de Medio Ambiente* or CONAMA), a small coordination and advisory group that belongs to the Ministry of Planning and Economic Policy.

Other decentralized institutions related to environmental issues and privatization of public utilities are: the National Ports Authority (*Autoridad Portuaria Nacional*, APN), the National Institute of Water and Wastewater (*Instituto de Acueductos y Alcantarillados Nacionales*, IDAAN), and the National Institute of Hydraulic Resources and Electricity (*Instituto de Recursos Hidráulicos y Electrificación*, IRHE).

With Technical Cooperation from IDB, Panama is in the process of developing a General Environmental Act (*Ley General del Ambiente*) (IDB, 1996 and Ministerio de Planificación y Política Económica, 1997). The Senate passed the environmental law in 1994 but the President vetoed it. A new one is currently in the final stages of debate⁶⁵. Few environmental standards are available (those that do exist are mainly from the Ministry of Health). The IDB's support also includes the development of the regulatory and institutional framework, and institutional strengthening of environmental units for the privatization of public services in the telecommunications, electric, and water and sanitation sectors.

The Ministry of Planning and Economic Policy (Ministerio de Planificación y Política Pública or MIPPE) advises the government regarding economic and social policies and provides assistance in the process of restructuring and privatization of public enterprises. The Coordination Unit for the Privatization Process (*Unidad Coordinadora para el Proceso de Privatización* or ProPrivat) of the Ministry of Finance and Treasury (Ministerio de Hacienda y Tesoro or MHT) was created by Law No. 16 (July 1992) to facilitate the privatization program and oversee the sale of government assets (ECLAC, 1998).

The government has created the Public Services Regulatory Agency (*Ente Regulador de los Servicios Públicos* or ERSP) which regulates the telecommunications, electricity and water/sanitation sectors⁶⁶. The ERSP is an autonomous institution⁶⁷ administratively related to the Ministry of Planning and Economic Policy. It has the responsibility of enforcing the norms and regulations, and gives concessions (for hydropower plants) and licenses (for thermal power plants) in coordination with several public institutions (including INRENARE). Panama just completed the privatization of some ports, telecommunications systems and other miscellaneous industries, and is in the process of doing the same with the electric, and water supply and sanitation sectors.

64 Mainly the Ministries of Planning and Economic Policy, Health, Agricultural Development, Housing, Commerce and Industry, Government and Justice, and Education.

65 This new law gives authority to INRENARE for approving Environmental Improvement Programs (*Programas de Adecuación Ambiental* or PAMAs) and to the Attorney General's Office (*Contraloría de la República*) for enforcing environmental legislation.

66 Law No. 26 of January 29, 1996 created the ERSP (*Gaceta Oficial*, 1996).

67 ERSP gets its income from a fee taken from the regulated companies (around 1% of gross sales).

5.2. Energy.

Generation, transmission, distribution and commercialization of electric power has been provided by IRHE, a public agency of the Republic of Panama. IRHE is a vertically integrated company for generation, transmission and distribution, and undertook the planning and regulation of public electricity services. The net installed capacity for Panama is 957 MW (data of 1995)⁶⁸. IRHE is the main electric producer and the rest is made up by the Panama Canal Commission (*Comisión del Canal de Panamá* or CCP), with a 142 MW plant, and the Chiriquí Land Company, with a 10 MW plant (ECLAC, 1998).

The government of Panama is reforming the entire electric sector towards increasing efficiency and improving the level of service through the introduction of competition and increasing private participation. For privatizing its services, the government has created a Restructuring Directorate (*Dirección de Reestructuración*) inside IRHE.

The Directorate has decided to create eight enterprises:

- a. Three companies of distribution, 51% private (15-year concession), 10% owned by the workers and the remaining owned by the government.
- b. Four generation companies: three hydropower companies with 49% private participation (50-year concession) with an administration contract; one thermoelectric power company with 51% private participation (non-ending license).
- c. One transmission company fully owned by the government but acting as a private enterprise. This firm will purchase all the electric power for -at least- the next 5 years.

The government owns all power companies with the exception of Petroeléctrica⁶⁹. Around 70% of all electricity comes from hydropower generation. The remaining has a thermal source.

IRHE has an Environment Management Unit (*Gerencia Nacional de Medio Ambiente*) which was created in 1979, as a watershed management section (mainly for erosion control) where hydropower generation occurs. In 1992, they expanded its duties to environmental control and monitoring of thermoelectric power plants and transmission lines. They have 95 permanent full-time employees and are in charge of watershed management, reforestation, soil conservation, environmental education, environmental auditing, etc. After the privatization, IRHE will either disappear or be reduced to a minimum level. The future of the environmental unit is uncertain and it is unclear who will be in charge of its current responsibilities (especially those related to watershed protection and protected areas management).

IRHE follows its own standards (i.e. emission norms) due to the lack of national regulation. There is an EIA law but it does not have regulations. Law No. 6 (*Gaceta Oficial*, 1997) dictates the electric regulatory and institutional framework during the privatization of the public agencies. This law has an important environmental component. It gives the authority to the regulatory agency to monitor and enforce the law before the institutional and legal arrangements are created/implemented. It also mandates public participation, the rational use of natural resources and the obligation for mitigation, rehabilitation and compensation of environmental damages.

⁶⁸ Hydropower produces 551 MW and thermal sources 406 MW.

⁶⁹ A 50-MW thermoelectric power plant privately owned.

Environmental enforcement is the responsibility of INRENARE⁷⁰ and the Ministry of Health (*Ministerio de Salud*). Each power company has an environmental unit. Environmental liabilities are unknown but a private firm will evaluate them prior to the privatization process (with the financial support of the multinational banking institutions). The Environmental Unit has already prepared the terms of reference.

Panama is not an oil, gas or coal producer. Its oil enterprises have always been in private hands (refineries, transportation and commercialization).

5.3. Water and Sanitation.

The National Institute of Water and Sanitation, IDAAN (*Instituto de Aguas y Alcantarillados Nacionales*) provides water and sanitation services to seven provinces plus an eighth zone composed of the Panama City Metropolitan area, West and East Panama (Panama Province) and the Province of Colón⁷¹. This last zone is the jurisdiction of the recently created IDAAN Metropolitana, S.A., a company that provides services to close to 74% of the total inhabitants of the area⁷². Current water rates are, in average, around US\$ 0.34 m³/s⁷³.

IDAAN's privatization committee (*Comisión de Incorporación de la Participación del Sector Privado* or CIPSP) plans to sell at least 51% of IDAAN Metropolitana, S.A.⁷⁴, and give thirty-year concessions to the Province of Chiriquí and the Central Provinces⁷⁵ (September-November, 1998)⁷⁶.

With the support of the IDB and World Bank, the government of Panama is accomplishing the following with regards to environmental issues (IDAAN, 1997):

- (i) Development of the regulatory and institutional framework (final stage).
- (ii) Establishment of a regulatory institution (already functioning).
- (iii) Estimation of environmental liabilities (to be started in 1998) but only limited to water supply and not sewerage.

Wastewater treatment is a complex topic that has no short-term solution and it is not included in the privatization of IDAAN. All rivers which release waters into the Panama Bay and the Bay itself are very polluted with raw industrial and domestic waste⁷⁷.

5.4. Transportation.

The government, through the Ministry of Public Works (*Ministerio de Obras Públicas* or MOP⁷⁸) awarded two road concessions both as BOTs (built, operate and transfer) to two Mexican firms:

70 INRENARE is in charge of assigning water licenses for different uses (hydropower, water supply, etc.).

71 The Ministry of Health provides water and sanitation services for locations with less than 1500 inhabitants.

72 IDAAN Metro provides water to 1.25 million people out of 1.45 million in its zone. There are approximately 211,000 existing water connections (less than half have measurement devices) and 42% of the total volume supplied is presumed lost or stolen.

73 Before 1962, water supply was provided at no cost.

74 The firms' pre-qualification stage has been already accomplished.

75 These include Cocle, Veraguas, Herrera and Los Santos.

76 Privatization of IDAAN Metropolitana includes the transfer of water rights for 150 gallons/day; the remaining 50 gallons/day (the total supply needed is approximately 200 gallons/day) will continue to be bought from to the Panama Canal Authority.

77 This problem is accentuated by having pluvial and sewerage waters in the same network.

78 The MOP has an environmental unit that was strengthened by IDB.

- (i) The construction of the Corredor Norte was concessioned to PYCSA in 1996. The design and its Environmental Improvement Programs or PAMA (*Programa de Adecuación Ambiental*; including an EIA)⁷⁹, went through intense environmental debate after its original (and controversial) design to pass through Panama City's Metropolitan Park (*Parque Metropolitano*)⁸⁰. The design was finally modified and with the MOP's input, INRENARE issued the construction license.
- (ii) The construction of the Corredor Sur concession to Empresas ICA S.A. in 1997. It has two stages. The PAMA for the first one was already approved; the second one is pending.

After the Corredor Norte concession several public roads have been constructed and environmental impact studies have been performed (MOP, 1997, and MOP/IDB, 1996). There are several BOT projects that are being planned. The route Chiriquí Grande-Bocas del Toro, in the isolated Province of Bocas del Toro, got a provisional permit from INRENARE to start construction. It is important to note that the MOP only performs control and monitoring and INRENARE is the only one with enforcement authority.

In August of 1996, the Ports of Colón and Balboa have been privatized to Hong-Kong's Hutchinson (storage, transportation and operation). INRENARE has already approved its PAMA for Colón and has requested its execution for Balboa.

In addition, the freight railroad from Panama to Colón has been concessioned to Kansas Railroad Company (USA). No PAMA/EIA development information was available.

Airports have not been privatized yet. The Tóccumen International Airport (Panama City) is planned to be concessioned in 1998.

Panama is scheduled to take over the management of the Panama Canal on December 31 of 1999. Privatization of the operations of the Canal has so far been ruled out, but there could be opportunities for service contracts for at least some of the day-to-day operation and maintenance functions (ECLAC, 1998).

6. **PERU.**

6.1. **General Background.**

The Peruvian Environmental and Natural Resources Code (*Código de Medio Ambiente y Recursos Naturales*)⁸¹ includes general policy issues and indicates the premises of sustainable development. It adopts the "who pollutes, pays" principle and provides general guidelines about environmental planning, education, public participation, safety, control, evaluation and enforcement. It also establishes the obligation to prepare EIAs but a later reform to the code⁸² gave authority to sectoral institutions to decide whether or not to comply with such requirement.

Environmental management responsibilities are widespread in the government's executive branch. Most ministries⁸³ and autonomous agencies have environmental units but there is widespread difference –with

⁷⁹ Because there is no regulation for the elaboration of EIAs, INRENARE uses the draft of the new environmental law as a guideline.

⁸⁰ This was the first PAMA developed for road concessions in the history of the country.

⁸¹ Approved on September 7, 1990 by Decree No. 611.

⁸² Mostly motivated with the reforms for encouraging private participation (IDB, 1994).

⁸³ Which includes mainly the Ministries of Energy and Mines, Agriculture, Industry, Tourism and Integration, Health, Fishing, and Economy and Finance.

regards to their goals, regulations and enforcement- among them. In December of 1994, a coordination and policy consolidation institution called the National Environmental Council (*Consejo Nacional del Ambiente* or CONAM) was created (CONAM, 1997). CONAM is still a young organization and will require time and effort to fulfill its goals.

Privatization of public corporations started in 1991 under the Committee to Promote Private Investment (*Comisión de Promoción de la Inversión Privada* or COPRI). COPRI's operations before April of 1997 amounted to a total of over US\$ 7 billion with investment commitments of an additional US\$ 7 billion. The Framework Law and Regulations for Increasing Private Investment (*Ley Marco y Reglamentos para el Crecimiento de la Inversión Privada*) and the Foreign Investment Promotion Law (*Ley De Fomento de la Inversión Extranjera*) support privatization activities. Privatization was carried out by a specialized committee created *ad-hoc* for the company in question. This committee was named CEPRI (*Comité de Privatización*) followed by the name of the firm (i.e. CEPRI-Centromin for the privatization of mining conglomerate Centromin-Peru). Most recently, an institution called Private Concessions Promotion Commission (*Comisión de Promoción de Concesiones Privadas* or PROMCEPRI)⁸⁴ was created. PROMCEPRI has the authority to determine which public works or services will be privatized (PROMCEPRI, 1997).

Peru has produced a considerable number of privatization and private participation laws. However, environmental issues (liabilities, EIAs, institutional arrangements, etc.) are, at best, superficially mentioned. As is shown in items 6.2. to 6.5. below, environmental concerns arose mostly during the privatization process of large enterprises in which foreign firms (mostly with strong environmental policies) were interested in acquiring.

6.2. Energy and Mining.

Environmental institutional and legal arrangements and realities vary dramatically for different sectors in Peru. The energy sector, which is managed by the Ministry of Energy and Mining (*Ministerio de Energía y Minas* or MEM), is one of the most active in environmental affairs.

Peru has an installed electric power close to 4700 MW (as of mid-1996), of which 54% comes from hydropower and the remaining from thermal sources.

Since 1994 around 10 power companies were privatized (*Comisión de Promoción de Concesiones Privadas*, June 1997)⁸⁵. The MEM gives generation, transmission and distribution concessions in virtue of the Electricity Concessions Law (*Ley de Concesiones Eléctricas*) and its regulations⁸⁶. The Commission of Electric Rates (*Comisión de Tarifas Eléctricas*) sets the electricity rates and regulation enforcement (including quality of service, safety, technical requirements, etc.) is performed by the newly created Energy Investment Supervisor Bureau (*Oficina de Supervisión de Inversiones en Energía* or OSINERG)⁸⁷. OSINERG is in charge of environmental enforcement, but this has not been implemented as of yet and is, for the time being, performed by the Oil, Mining or Electricity Directorates⁸⁸ (all belonging to the MEM). EIAs are required for obtaining construction licenses of new power plants (mostly private) from the General Electricity Directorate (*Dirección General de Electricidad*) of the MEM. There is no information about environmental requirements during the privatization of electric utilities.

84 Created by the Promotion of Private Investment in Public Works and Services Law (*Ley de Promoción de la Inversión Privada en Obras de Infraestructura y Servicios Públicos*).

85 About 60% of all electricity operations are in private hands (El Comercio, 1997).

86 The law was approved in November 1992 (decree 25844) and its regulations in February 1993.

87 Both CTE and OSINERG are autonomous entities but have administrative ties to the MEM.

88 Monitoring is performed with the assistance of registered contractors.

Peru is a country with vast gas and oil reserves⁸⁹. For decades, oil exploration, exploitation, processing, transportation and distribution have been managed by government-owned conglomerate Petro-Peru. In late 1980s and especially at the beginning of the 1990s, private investments were allowed specially in oil exploration.

With the approval of the new Oil Law (*Ley del Petroleo*) in 1993, private sector involvement has been intensified at all stages⁹⁰. Since then, several facilities have been sold to the private sector⁹¹. Before privatizing these companies, all Environmental Improvement Programs (*Programas de Adecuación Ambiental* or PAMA) were completed and approved by the MEM's *Dirección de Hidrocarburos* (Hydrocarbons Directorate)⁹². In the case of La Pampilla (the largest refinery in Peru with a capacity to process 100,00 barrels of oil processed), Petro-Peru and the new owner have selected an independent consultant to perform an environmental assessment, identify environmental liabilities and recommend remediation alternatives. The remediation plan will be entirely financed by the government⁹³. However, the upgrade of polluting equipment will be the responsibility of the new owner. Other facilities to be privatized include the Talara ⁹⁴, Iquitos⁹⁵ and Conchán Refineries⁹⁶, the Nor-Peruano Oil Pipeline, and oil terminals. Because oil and its by-products follow market-forces prices, no regulatory agency was created.

Petro-Peru has an Environmental Protection Unit (*Unidad de Protección Ambiental*)⁹⁷ but all companies belonging to the holding have one as well. Petro-Peru has a defined environmental policy (Petroleos del Perú, 1997) and follows oil environmental standards, which are similar to ISO 14000⁹⁸. The MEM and the Port Authorities (*Capitanías de Puertos*) are responsible for oil management environmental enforcement.

Peru has also large and unused natural gas reserves. The environmental measures taken for the future development of the Camisea Project⁹⁹ deserve a brief discussion even though no privatization scheme is involved. The Shell Prospecting and Development Company is in the process of completing the studies for developing the largest natural gas reserve in South America (approximately 11 trillion m³)¹⁰⁰. Shell has hired top environmental firms to conduct an EIA (Environmental Resources Management Peru, 1996) and mitigation studies and has an independent environmental non-government organization monitoring the entire effort¹⁰¹. Shell has also taken all the necessary preventive measures in the construction of the exploration

89 Peru produced 43,157,111 barrels of crude oil and 8,530,880 cubic feet of natural in 1997 (El Comercio, 1998).

90 Environmental protection in oil activities is mandated by Decree 046 of the Oil Law regulations.

91 It is estimated that 75% of all privatization activities have been concluded (El Comercio, 1997).

92 As an example, refer to the PETROLUBE Motor Oil privatization plant. The PAMA identified environmental liabilities and remediation activities for an estimated amount of US\$ 51 million. In the sale contract with the new owner (CEPRI-PETRO-PERU, 1996), all responsibilities with time schedules and costs were listed.

93 Initial estimates conclude the need of investing US\$ 15 million for remediation in La Pampilla.

94 A 75-year old facility that refines 80,000 oil barrels per day.

95 Refines around 10,000 oil barrels per day.

96 Refines around 8,000 oil barrels per day.

97 Since 1989.

98 Oil pollution has become a major environmental issue in Peru. Petro-Peru had to perform clean-up duties for spilling 200 barrels of crude oil nearby the Conchán Refinery in 1995 (Lobato, 1997). The local municipality also fined the company US\$ 250,000.

99 The project is located in the "Departamento" of Cuzco, a remote and environmentally sensitive area approximately 500 km South east of Lima.

100 It also includes major infrastructure for making the gas available to large markets. It includes a gas pipeline of 400-500 km.

101 Shell has an environmental unit, which is involved in the environmental enforcement of all activities.

and transportation infrastructure. The respect for nature¹⁰², cultural indigenous values and its interest in community development, makes this project a candidate for a model of sustainability¹⁰³.

Peru has an extraordinary mining potential¹⁰⁴. For years, the government owned large mines and metallurgical centers. With the new Mining Law (*Ley de Minería*) in 1992, the government tried to privatize some of its assets. Due to an excessive level of environmental liabilities and mismanagement, the privatization of the large mining conglomerate *Empresa Minero del Centro* (Centromin-Peru) failed. In 1994, a new CEPRI-Centromin was created with a very different approach. Preliminary Environmental Evaluation studies (*Evaluación Ambiental Preliminar* or EVAP), detailed PAMAs and remediation programs were elaborated for all mining activities. Implementation of well-needed reengineering activities in the mining processes have contributed to substantial reduction of pollution levels and created important savings to the company. All PAMAs were approved in 1996 by MEM and the remediation process started. Several companies of Centromin-Peru have been already privatized. An Environmental Remediation Fund (*Fondo de Remediación Ambiental*) was created to fulfill the commitments made on the acquisition contracts. For fiscal year 1996 the fund has collected US\$ 30 million and by the end of 1997 the amount should have doubled.

Other mining complexes like Hierro-Peru a large iron mine and metallurgy, was privatized to a Chinese corporation with very little environmental considerations. Several other mines were also privatized and large Canadian, American and European companies are operating them with careful environmental management. Still, there are more than 55,000 small and medium mines with little or no environmental programs.

The Ministry of Energy and Mines has a very active environmental unit, called the General Directorate of Environmental Affairs (*Dirección General de Asuntos Ambientales* or DGAA) which reports to the Vice-Ministry of Mines. This unit is in charge of policy development and the production of environmental norms in energy, mining and oil.

All existing energy companies (public, private or mixed) are required by law to develop an EVAP and a PAMA, which has to be approved for continuing operations. A PAMA contains an environmental audit and a mitigation/remediation plan. For new energy enterprises an EIS is mandatory. All of these are reviewed and evaluated by DGAA and it recommends approval or rejection. The Directorate has developed a valuable and large number of publications including guidelines for environmental studies, monitoring techniques, standards and listings of pertinent existing legislation (*Dirección General de Asuntos Ambientales*, 1997), which are available in paper and in their webpage¹⁰⁵.

All EIAs are presented and debated publicly in public audiences (mandated by law). The DGAA is responsible for coordinating these activities. Staff members are very satisfied with the input of all the parties involved and have conveyed a large number of environmental organizations and general public. The DGGA is also heavily involved in training (a list of courses and seminars are available in their webpage).

All companies to be privatized have to have an approved PAMA. The government has negotiated the remediation plan and most environmental liabilities are to be financed by those companies in explicitly

¹⁰² Including and exhaustive assessment of biodiversity and natural resources of the very fragile ecosystem.

¹⁰³ Another interesting effort is discussed in MEM's magazine *Asuntos Ambientales* (MEM, 1997).

¹⁰⁴ In 1996, 45% of all export came from the mining sector and 6% from oil and by-products (Centromin-Peru, 1996). Total export amounted US\$ 5.9 billion.

¹⁰⁵ Comprehensive information about the DGAA, PAMAs, publications, consultants and activities are available at their webpage. A bi-monthly magazine entitled *Asuntos Ambientales* (Environmental Affairs) is also published by MEM and is included in the DGAA webpage.

defined sales/concession contracts. The government also signs an Environmental Stability Contact (*Contrato de Estabilidad de Iniciativa Ambiental*) in which the new owner follows all environmental legislation up to the date of contract signing and for a period of time, usually for five years after that.

6.3. Water and Sanitation.

The Peruvian water and sanitation services are, in general, below any acceptable standard, both in quality and reliability¹⁰⁶. Most water supply facilities have basic treatment but sanitation infrastructure only collects sewerage and disposes it raw to different water bodies. This has created serious health problems and environmental liabilities.

For years, all water and sanitation utilities were managed by the central government. However, the Sanitation Services Act (*Ley General de Servicios de Saneamiento*) of 1994, transferred ownership of those companies to the municipalities¹⁰⁷ with the exception of SEDAPAL, Lima's water company. The new owners manage the utilities and are authorized to sign contracts, form joint ventures/partnerships and grant concessions. On the other hand, the Superintendence of Sanitary Services (*Superintendencia Nacional de Servicios Sanitarios* or SUNASS) was created, as the national regulatory agency. Its main role is to set tariffs and to guarantee a quality service that preserves the good health of the population and protects the environment (*Comisión de Promoción de Concesiones Privadas*, 1997 and SUNASS, 1996). So far, SUNASS was able to comply with some of its regulation duties, but little environmental monitoring and enforcement is performed.

In 1993, SEDAPAL was in the process of being privatized with the support of the World Bank. This operation was halted by the central government, and since then no other privatization initiative prospered. The government has several programs to improve water and sanitation services¹⁰⁸ but still no private participation is expected¹⁰⁹ due to the lack of political will, insufficiency of incentives, incomplete legislation and weak institutional arrangements.

6.4. Transportation.

In the early 1990s, the conditions of Peruvian roads were very precarious. In 1990, the national road network covered 69,942 km, of which only 8% were paved. The Special Project for the Rehabilitation of Transportation Infrastructure (*Proyecto especial de Rehabilitación de Infraestructura de Transporte* or PERT) is investing US\$ 1.157 billion to improve road conditions in the country¹¹⁰.

The Ministry of Transportation, Communications, Housing and Construction (*Ministerio de Transporte, Comunicaciones, Vivienda y Construcción* or MTCVC), through its Special Concessions Committee: National Road Network (Comité Especial de Concesiones: Red Vial Nacional), is in the process of an international bid for awarding concessions of 6,830 km of roads around the nation (El Comercio, 1997). There is no information about the elaboration of any environmental studies for those operations. The General Directorate of Environment (*Dirección General de Medio Ambiente* or DGMA) of the MTCVC has

¹⁰⁶ The last national census of 1993 found that only 57.4% and 42.6% of all homes had potable water and sanitation services, respectively.

¹⁰⁷ Around 40 municipality-owned utilities were created under the name of Empresas Prestadoras de Servicios or EPS.

¹⁰⁸ IDB has a large urban services improvement operation through the National Potable Water Program (Programa Nacional de Agua Potable or PRONAP).

¹⁰⁹ Like the one in the Northern City of Piura with SEDAPIURA (SEDAPIURA, 1995).

¹¹⁰ This project started in 1992 and will be finished in 1999. It is supported by several multinational financial institutions, including the IDB.

prepared several manuals for the design, construction, supervision, operation and maintenance of urban and rural roads (MTCVC, 1997). It is expected that all concessionaires who will enhance or build new roads will follow the mentioned guidelines.

Peru has 14 main ports in its territory (10 located in the Pacific Ocean and 4 in navigable rivers in the jungle region). However, more than 70% of the shipping and unloading activities are concentrated in the port of Callao. In 1990, all ports mobilized 7,779 tons of cargo but in 1996 it increased to 13,657 tons. All ports are managed by the state-owned enterprise Nacional Ports Enterprise (*Empresa Nacional de Puertos* or ENAPU). Privatizations are expected in the near future but no details are available.

The Airports and Commercial Aviation Corporation (*Corporación Peruana de Aeropuertos y Aviación Comercial* or CORPAC) manages 33 airports in Peru. Between 1990 and 1996, the number of domestic and international flights had increased by 41.1%, the number of passengers by 58.1% and the volume of freight by 125%. PROMCEPRI is planning to privatize the 8 major airports with one concessionaire. No information about any pre-privatization environmental studies was found.

A regulatory agency called Transportation Investment and Infrastructure Supervisory Organization (*Organismo Supervisor de la Inversión en Infraestructura de Transporte de Uso Público* or OSITRAN) was created by Law 26917 in January 1998. Its main mission is to monitor and enforce concession agreements (including tariffs) for ports, airports, railroads and roads. However, no environmental enforcement has been specified.

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